

Enclosure  
L-13-387

**FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
Units 1 and 2**

**NFPA 805  
Transition Report**

**(2,202 pages follow)**

Attachments C, D, E, G, S, V, and W of this enclosure contain security-related information, and should be withheld from public disclosure in accordance with 10 CFR 2.390. Upon removal of Attachments C, D, E, G, S, V, and W, this enclosure is uncontrolled.

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**FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
Units 1 and 2**

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



**Transition Report**

**November 2013**

Attachments C, D, E, G, S, V, and W of Enclosure 1 to this letter contain security-related information. Withhold from public disclosure under 10 CFR 2.390. Upon removal of Attachments C, D, E, G, S, V, and W of Enclosure 1, this letter is uncontrolled.

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Note 1: Internal Events PRA Quality attachment is not included in this document. Previously submitted by FENOC letter dated October 18, 2013 (ML13295A006). Refer to Section 4.5.1.1.

## Executive Summary

First Energy Nuclear Operating Company (FENOC) will transition the Beaver Valley Power Station Units 1 and 2 (BVPS-1 and BVPS-2) fire protection program to a new risk-informed, performance-based (RI-PB) alternative per 10 CFR 50.48(c), which incorporates by reference NFPA 805. The licensing basis per 10 CFR 50.48(b), 10 CFR 50, Appendix R, and BTP CMEB 9.5-1 (NUREG-0800, July 1981) will be superseded. The voluntary adoption of 10 CFR 50.48(c) by BVPS-1 and BVPS-2 does not eliminate the need to comply with 10 CFR 50.48(a), 10 CFR 50 Appendix A, and GDC 3 Fire Protection. However, compliance with the new rule establishes compliance with these requirements.

The transition process consisted of a review and update of BVPS-1 and BVPS-2 documentation, including the development of a Fire Probabilistic Risk Assessment (FPRA) using NUREG/CR 6850 as guidance. This Transition Report summarizes the transition process and results. This Transition Report contains information:

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

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

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

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

- Changes to the License Condition
- Changes to the Technical Specifications, Orders, and Exemptions,
- Determination of No Significant Hazards and evaluation of Environmental Considerations.

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

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

## Acronym List

A/C	Air Conditioning
AB	Auxiliary Building
AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ADV	Atmospheric Dump Valve
AFP	Auxiliary Feedwater Pump
AFW	Auxiliary Feedwater
AHJ	Authority Having Jurisdiction
ALT	Alternate
ANS	American Nuclear Society
ANSI	American National Standards Institute
AOP	Abnormal Operating Procedure
APCSB	Auxiliary & Power Conversion Systems Branch
API	American Petroleum Institute
ARS	Appendix R Solutions, Inc.
ARW	Auxiliary River Water
ASDV	Atmospheric Steam Dump Valve
ASME	American Society of Mechanical Engineers
ASP	Auxiliary Shutdown Panel
ASTM	American Society for Testing and Materials
AUX	Auxiliary
B/U	Backup
BAT	Boric Acid Tank
BD	Blowdown
BIP	Backup Indicating Panel
BIT	Boron Injection Tank
BKR	Breaker
BLDG	Building
BLDN	Building
BOP	Balance of Plant
BR	Boron Recovery
BTP	Branch Technical Position
BU	Backup
BV	Beaver Valley
BV1	Beaver Valley Power Station, Unit 1
BV2	Beaver Valley Power Station, Unit 2
BVPS-1	Beaver Valley Power Station, Unit 1
BVPS-2	Beaver Valley Power Station, Unit 2
BWROG	Boiling Water Reactor Owners' Group
CC	Capability Category
CCDP	Conditional Core Damage Probability
CCP	Component Cooling Pumps
CCR	Component Cooling Water
CCS	Containment Cooling System
CCW	Component Cooling Water
CDF	Core Damage Frequency
CEB	Chemical Engineering Branch

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CEI	Cleveland Electric Illuminating
CFAST	Consolidated Fire and Smoke Transport
CFR	Code of Federal Regulations
CIA	Containment Isolation Phase A
CIB	Containment Isolation Phase B
CLB	Current Licensing Basis
CMEB	Chemical Engineering Branch
CMU	Condensate Makeup
CNMT	Containment
CO2	Carbon Dioxide
CP	Condensate Polishing
CPR	Cardiopulmonary Resuscitation
CR	Corrective Action
CRS	Control Room Supervisor
CVCS	Chemical Volume and Control System
CWP	Chilled Water Pump
D/G	Diesel Generator
DBA	Design Basis Accident
DBD	Design Basis Document
DC	Direct Current
DCP	Design Change Package
DFM	Detailed Fire Modeling
DGP	Data Gathering Panel
DID	Defense-in-Depth
DL	Division of Licensing
DLC	Duquesne Light Company
DWST	Demineralized Water Storage Tank
ECP	Engineering Change Package
EDG	Emergency Diesel Generator
EEEE	Existing Engineering Equivalency Evaluation
ELEV	Elevation
EOOS	Equipment Out of Service
EOP	Emergency Operating Procedure
EPA	Electrical Penetration Assemblies
EPM	Engineering Planning and Management
ERO	Emergency Response Organization
EPRI	Electric Power Research Institute
ERF	Emergency Response Facility
ERFBS	Electrical Raceway Fire Barrier System
ESFAS	Engineered Safety Feature Actuation System
ESWGR	Electrical Switchgear
F&O	Facts and Observations
FA	Fire Analysis
FAQ	Frequently Asked Question
FCV	Flow Control Valve
FDT	Fire Dynamics Tool
FEDB	Fire Event Database
FENOC	First Energy Nuclear Operating Company
FHB	Fuel Handling Building

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FIVE	Fire Induced Vulnerability Evaluation
FM	Factory Mutual
FMWB	Fire Modeling Workbook
FP	Fire Protection
FPH	Fire Water Pump House
FPP	Fire Protection Plan
FPPCE	Fire Protection Program Change Evaluation
FPRA	Fire Probabilistic Risk Assessment
FPS	Fire Protection System
FPSSR	Fire Protection Safe Shutdown Report
FR	Federal Register
FRE	Fire Risk Evaluation
FSAR	Final Safety Analysis Report
FWIV	Feedwater Isolation Valve
FWST	Fire Water Storage Tanks
GDC	General Design Criterion
GEN	Generator
GL	Generic Letter
HCV	Hydraulic Control Valve
HDR	Header
HEAF	High Energy Arcing Faults
HELB	High Energy Line Break
HEP	Human Error Probability
HFE	Human Failure Event
HGL	Hot Gas Layer
HHSI	High Head Safety Injection
HNP	Harris Nuclear Plant
HPSI	High Pressure Safety Injection
HRA	Human Reliability Analysis
HRE	High Risk Evolution
HRR	Heat Release Rate
HSB	Hot Standby
HSS	High Safety Significant
HVAC	Heating, Ventilation, and Air Conditioning
HX	Heat Exchanger
IAW	In Accordance With
ICM	Interim Compensatory Measures
IEEE	Institute of Electrical & Electronics Engineers
IF	Ignition Frequency
IFA	Internal Flooding Analysis
IGFCF	Ignition Frequency Correction Factor
IMC	Inspection Manual Chapter
IPE	Individual Plant Evaluation
IPEEE	Individual Plant Examination of External Events
ISLOCA	Intersystem Loss of Coolant Accident
ISOL	Isolation
Keff	K(effective)
KSF	Key Safety Functions
LA	Licensing Action

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LAR	License Amendment Request
LCP	Local Control Panel
LERF	Large Early Release Frequency
LFS	Limiting Fire Scenario
LHSI	Low Head Safety Injection
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
LOSP	Loss of Station Power
LPSI	Low Pressure Safety Injection
LSS	Low Safety Significant
LWD	Liquid Waste Disposal
LWM	Liquid Waste Management
M/U	Make-Up
MCA	Multi-Compartment Analysis
MCC	Motor Control Center
MCR	Main Control Room
MEFS	Maximum Expected Fire Scenario
MFW	Main Feedwater
MFP	Main Feedwater Pump
MFRV	Main Feedwater Regulatory Valve
MG	Motor Generator
MHIF	Multiple High Impedance Faults
MOD	Motor Operated Damper
MOU	Memorandum of Understanding
MOV	Motor Operated Valve
MS	Main Steam
MSIV	Main Steam Isolation Valve
MSO	Multiple Spurious Operation
MSSV	Main Steam Safety Valve
NBISR	National Bureau of Standards Report
NEC	National Electrical Code
NEI	Nuclear Energy Institute
NEIL	Nuclear Electric Insurance Limited
NELPIA	Nuclear Energy Liability Property Insurance Association
NFPA	National Fire Protection Association
NI	Nuclear Instrumentation
NIST	National Institute of Standards and Technology
NPO	Non-Power Operation
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSCA	Nuclear Safety Capability Assessment
NSEL	Nuclear Safety Equipment List
NSPC	Nuclear Safety Performance Criteria
OCA	Owner Controlled Area
OCB	Oil Circuit Breaker
OCS	Oil Collection System
ODCM	Offsite Dose Calculation Manual
OL	Operating License

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OMA	Operator Manual Action
OOS	Out of Service
OS&Y	Outside Screw and Yoke
OSHA	Occupational Safety and Health Administration
OST	Operating Surveillance Test
P&ID	Process & Instrumentation Diagram
PAB	Primary Auxiliary Building
PCA	Potentially Contaminated Area (Shop)
PCB	Powered Circuit Breaker
PCV	Pressure Control Valve
PDMS	Plant Database Management System
PDP	Power Distribution Panel
PPDWST	Primary Plant Demineralizer Water Storage Tank
PFP	Pre-Fire Plan
PG	Primary Grade
PIV	Post Indicator Valve
PORV	Pilot Operated Relief Valve
POS	Plant Operational State
PRA	Probabilistic Risk Assessment
PRV	Pressure Regulating Valve
PVC	Polyvinyl Chloride
PWR	Pressurized Water Reactor
PWROG	PWR Owners Group
PZR	Pressurizer
QA	Quality Assurance
QAPM	Quality Assurance Program Manual
QS	Quench Spray
RA	Radiation Alarm
RAB	Reactor Auxiliary Building
RAD WASTE	Radioactive Waste
RAI	Request for Additional Information
RAW	Risk Achievement Worth
RCA	Radiological Controlled Area
RCB	Reactor Containment Building
RCGVS	Reactor Coolant Gas Vent System
RCL	Reactor Coolant Loop
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RCZ	Radiological Controlled Zone
REJ	Rubber Expansion Joint
RG	Regulatory Guide
RHR	Residual Heat Removal
RHR	Residual Heat Release (when used in specific reference to the residual heat release valves: HCV-1MS-104 for BVPS-1 or 2SVS-HCV104 for BVPS-2)
RHS	Residual Heat System
RI-PB	Risk-Informed, Performance-Based
RIS	Regulatory Issue Summary
RMSB	Radwaste Material Storage Building

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RP	Radiation Protection
RPS	Reactor Protection System
RS	Recirculation Spray
RSB	Radwaste Solidification Building
RV	Relief Valve
RW	River Water
RWSP	Reactor Water Storage Pool
RWST	Refueling Water Storage Tank
RX	Reactor
SAFE	System Assurance and Fire Protection Engineering Software
SAMG	Severe Accident Management Guideline
SER	Safety Evaluation Report
SFPE	Society of Fire Protection Engineers
SG	Steam Generator
SGBD	Steam Generator Blowdown
SGTR	Steam Generator Tube Rupture
SI	Safety Injection
SIS	Safety Injection System
SLCRS	Supplementary Leak Collection and Release System
SM	Safety Margin
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SOSB	South Office and Shops Building
SOV	Solenoid Operated Valve
SR	Supporting Requirements
SRM	Staff Requirements Memoranda
SRP	Standard Review Plan
SRV	Safety Relief Valve
SS	Station Service
SSA	Safe Shutdown Analysis
SSC	Structure, System, or Component
SSD	Safe Shutdown
SSE	Safe Shutdown Earthquake
SSEL	Safe Shutdown Equipment List
SSER	Supplement Safety Evaluation Report
STBY	Standby
SW	Service Water
SWGR	Switchgear
SWS	Service Water System
SWYD	Switch Yard
T/C	Thermocouple
T/H	Thermal-Hydraulic
TAC	Technical Assignment Control
TCV	Temperature Control Valve
TD	Turbine-Driven
TDAFW	Turbine-Driven Auxiliary Feedwater Pump
TECH SPECS	Technical Specification
TER	Technical Evaluation Report
TR	Transition Report
TRM	Technical Requirements Manual



TURB BLDG	Turbine Building
UFPARR	Updated Fire Protection Appendix R Review
UFSAR	Updated Final Safety Analysis Report
UL	Underwriters Laboratory
V&V	Verification and Validation
VAC	Volts AC
VCT	Volume Control Tank
VFDR	Variances from Deterministic Requirements
VLV	Valve
WebTRAN	Web Transition Database
WR	Wide Range
ZOI	Zone of Influence

## 1.0 INTRODUCTION

The Nuclear Regulatory Commission (NRC) has promulgated an alternative rule for fire protection requirements at nuclear power plants, 10 CFR 50.48(c), National Fire Protection Association Standard 805 (NFPA 805). FENOC is implementing the Nuclear Energy Institute methodology NEI 04-02, Revision 2, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)" (NEI 04-02), to transition Beaver Valley Power Station Units No. 1 and No. 2 (BVPS-1 and BVPS-2) from their current fire protection licensing basis to the new requirements as outlined in NFPA 805. This report describes the transition methodology utilized and documents how BVPS-1 and BVPS-2 comply with the new requirements.

### 1.1 Background

#### 1.1.1 NFPA 805 – Requirements and Guidance

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

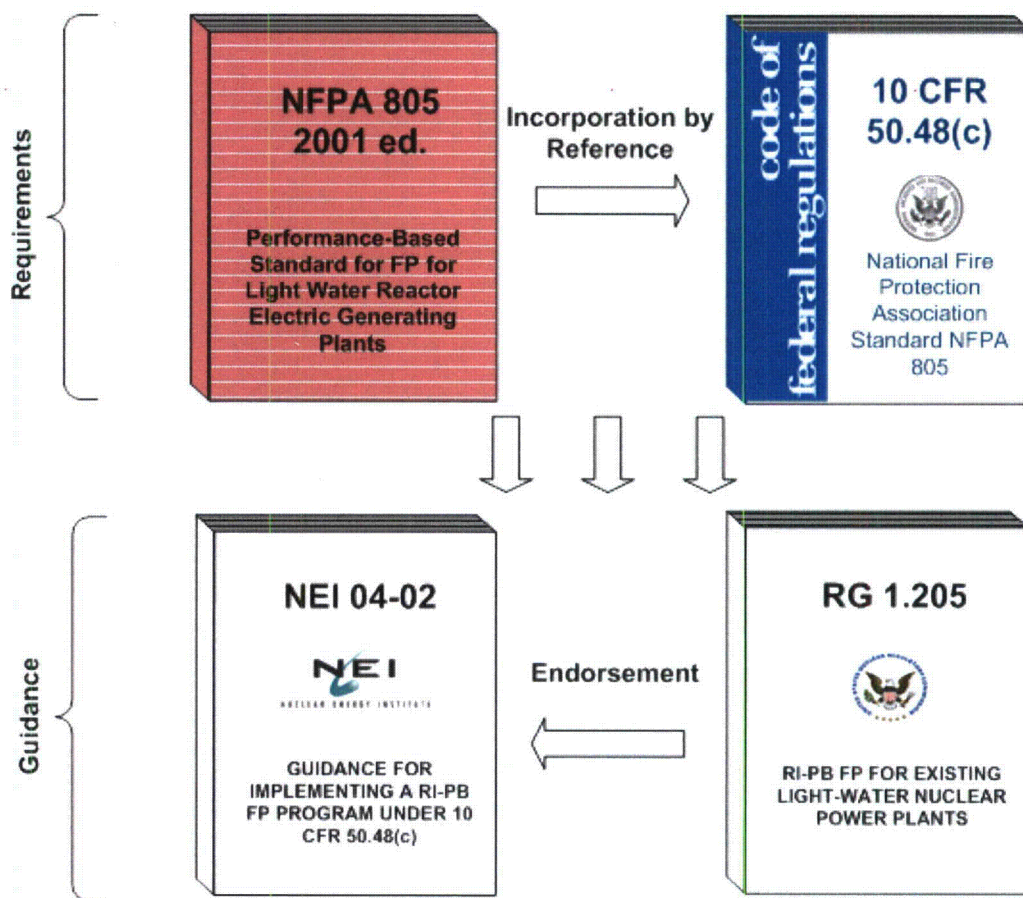
As stated in 10 CFR 50.48(c)(3)(i), any licensee's adoption of a RI-PB program that complies with the rule is voluntary. This rule may be adopted as an acceptable alternative method for complying with either 10 CFR 50.48(b), for plants licensed to operate before January 1, 1979, or the fire protection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

NEI developed NEI 04-02 to assist licensees in adopting NFPA 805 and making the transition from their current fire protection licensing basis to one based on NFPA 805. The NRC issued 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.<sup>1</sup>

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

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<sup>1</sup> Where referred to in this document NEI 04-02 is Revision 2 and RG 1.205 is Revision 1.



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

## 1.1.2 Transition to 10 CFR 50.48(c)

### 1.1.2.1 Start of Transition

FENOC submitted a letter of intent to the NRC on December 22, 2005 (ML0600402590) for BVPS-1 and BVPS-2 to adopt NFPA 805 in accordance with 10 CFR 50.48(c).

The NRC letter to FENOC (BV) dated August 1, 2011 (ML112010151 and TAC Nos. ME6628, ME6627 and ME6613), granted the enforcement discretion for fire protection issues to be extended to correspond with the LAR submittal date in accordance with the Interim Enforcement Policy concerning enforcement discretion for certain fire protection issues as published in the Federal Register on July 12, 2011 (76 FR 40777). In a letter dated June 29, 2011 (ML111800765), FENOC committed to submit its license amendment application by September 30, 2012. In letters dated August 29, 2012 (ML12243A245) and November 2, 2012 (ML12308A042), FENOC notified the NRC of a change in submittal date for its license amendment request (LAR) to be no later than December 31, 2013. An NRC Confirmatory Order dated February 20, 2013 (ML12335A267) approved both the change in submittal date and the enforcement discretion until the LAR submittal date of December 31, 2013.

### **1.1.2.2 Transition Process**

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

- A new Nuclear Safety Capability Assessment (NSCA).
- A new Fire Probabilistic Risk Assessment (FPRA) using NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," as guidance and a revision to the Internal Events PRA to support the FPRA.
- Completion of activities required to transition the pre-transition Licensing Basis to 10 CFR 50.48(c) as specified in NEI 04-02 and RG 1.205.
- Modifications implemented at the plant.

## **1.2 Purpose**

The purpose of the Transition Report is as follows:

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

## 2.0 OVERVIEW OF EXISTING FIRE PROTECTION PROGRAM

### 2.1 Current Fire Protection Licensing Basis

BVPS-1 and BVPS-2 were licensed to operate on July 2, 1976, and August 14, 1987, respectively. As a result, the BVPS-1 and BVPS-2 fire protection programs are based on compliance with 10 CFR 50.48(a), 10 CFR 50.48(b), GDC-3 Fire Protection, 10 CFR 50 Appendix R (Sections III.G, III.J, and III.O), BTP CMEB 9.5-1 (NUREG-0800), and the following license conditions:

FENOC BVPS-1 License Condition 2.C(5) states:

*FENOC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report (UFSAR) for the facility, subject to the following provision: FENOC may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.*

FENOC BVPS-2 License Condition 2.F states:

*FENOC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report through Amendment No. 17, and submittals dated May 18, May 20, May 21, June 24 and July 6, 1987, and as described in the Safety Evaluation Report dated October 1985, and Supplements 1 through 6, subject to the following provision:*

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

### 2.2 NRC Acceptance of the Fire Protection Licensing Basis

In response to NRC fire protection program guidance issued in 1976, BVPS-1 performed a fire hazards analysis that analyzed the BVPS-1 fire protection program against the guidance of Appendix A to BTP APCSB 9.5-1. The results of the analysis, in addition to proposed modifications and additions to the fire protection system, were communicated to the NRC by letter dated October 27, 1976, and served as the basis for the Appendix A to BTP APCSB 9.5-1 SER, dated June 6, 1979, which issued Amendment 18 to the BVPS-1 Technical Specifications.

This SER also stated that "The licensee has performed a fire hazards analysis and has proposed certain modifications to improve the fire protection program. Additional modifications have been proposed by the licensee during the course of our review, which are based upon the fire hazards analysis and our onsite evaluation of the fire protection program."

- An exemption was granted due to the lack of an automatic fire suppression system for the Control Room (1-CR-1). The exemption request was transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, December 10, 1982, and December 21, 1982. The exemption approval was provided by the NRC in SERs dated January 5, 1983, and March 14, 1983. (BVPS-1 LA 11.01)

- An exemption was granted due to the lack of adequate cable separation in the BVPS-1 Reactor Containment building (1-RC-1). The exemption request was transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, December 10, 1982, and December 21, 1982. The exemption approval was provided by the NRC in SERs dated January 5, 1983, and March 14, 1983. (BVPS-1 LA 11.02)
- An exemption was granted for the Blender Room in the Primary Auxiliary Building (1-PA-1G) for the lack of automatic fire suppression and full area fire detection. The exemption request was transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, December 10, 1982, and December 21, 1982. The exemption approval was provided by the NRC in SERs dated January 5, 1983, and March 14, 1983. (BVPS-1 LA 11.03)
- An exemption was granted due to the lack of adequate cable and component separation and automatic fire suppression and detection in the BVPS-1 Pipe Tunnel (1-PT-1). The exemption request was transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, December 10, 1982, and December 21, 1982. The exemption approval was provided by the NRC in SERs dated January 5, 1983, and March 14, 1983. (BVPS-1 LA 11.04)
- An exemption was granted for the Cable Tunnel (1-CV-3) due to the lack of an automatic suppression system and required cable separation. The exemption request was transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, December 10, 1982, and December 21, 1982. The exemption approval was provided by the NRC in SERs dated January 5, 1983, and March 14, 1983. (BVPS-1 LA 11.05)
- An exemption was granted for the Primary Auxiliary Building (1-PA-1G, Elev. 722'-6") and the Charging Pump Cubicles (PA-1f, PA-1g, and PA-1h) for the lack of 20 ft. separation with no automatic fire suppression and lack of full coverage detection systems. Exemption request transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letter dated October 22, 1982. The exemption approval was provided by the NRC in an SER dated March 14, 1983. (BVPS-1 LA 11.06)
- An exemption was granted for the Primary Auxiliary Building (1-PA-1A, Elev. 768'-7") for the lack of automatic fire suppression and full coverage detection systems. Exemption request transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.07)
- An exemption was granted for the Control Room HVAC Equipment Room (1-CR-2) for the lack of automatic fire suppression systems and a fire area boundary (fire door) with a rating less than three hours. The exemption request was transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.08)
- An exemption was granted for the Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) for the lack of automatic fire suppression and the lack of three hour fire barriers (ceiling and fire dampers). The exemption request was transmitted by

BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.09)

- An exemption was granted for the Process Instrument Room (1-CR-4) for the lack of automatic fire suppression and the lack of three hour fire barriers (ceiling and doors). The exemption request was transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.10)
- An exemption was granted for the Communication Equipment and Relay Panel Room (1-CR-3) for the lack of automatic fire suppression and the lack of three hour fire barriers (ceiling and doors). The exemption request was transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.11)
- An exemption was granted for the Normal Switchgear Room (1-NS-1) for the lack of automatic fire suppression and the lack of three hour fire barriers (fire dampers). The exemption request was transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.12)
- An exemption was granted for the Carbon Dioxide Storage/PG Pump Room (1-CO-2) for the lack of automatic fire suppression and full coverage detection systems. The exemption request was transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.14)
- An exemption was granted for the Pipe Tunnel (Sub-area 1-QP-1) for the lack of automatic fire suppression and full coverage detection systems. The exemption request was transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.15)
- An exemption was granted for the Reactor Containment (1-RC-1) for the lack of required cable separation of redundant trains of circuits associated with source range monitors within the containment building. The original exemption request for the Reactor Containment is described in Licensing Action No. 11.02. Clarifications of cable routing in the Reactor Containment were provided in BVPS-1 letter dated October 22, 1982. The exemption was approved by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.16)
- An exemption was granted for the Cable Spreading Room (1-CS-1) for the lack of three hour barriers (doors, fire dampers, and floor). The exemption request was transmitted by BVPS-1 letter dated December 16, 1983, and supplemented by letter dated May 30, 1984. The exemption approval was provided by the NRC in an SER dated August 30, 1984. (BVPS-1 LA 11.17)
- An exemption was granted for various fire door assemblies, combined with BVPS-1 modifications in the plant. The exemption request was transmitted by BVPS-1 letter dated January 14, 1985, and supplemented by letters dated October 16, 1985 and October 28, 1986. The January 14, 1985 letter requested an exemption from the

requirement of 10 CFR 50 Appendix R, III.G.2 for various fire door assemblies because the doors in question do not have UL labels and/or modifications have been made to the rated fire doors. The staff reviewed the fire door submittal as a deviation from conformance to Appendix A of BTP 9.5-1 and found the exemption acceptable. The exemption was approved by the NRC in an SER dated December 4, 1986. (BVPS-1 LA 11.18)

- An exemption was granted for various fire dampers. The exemption request was transmitted by BVPS-1 letter dated January 14, 1985, and supplemented by letters dated October 16, 1985, October 28, 1986, and December 19, 1989. BVPS-1 letter dated January 14, 1985 requested an exemption from the requirement of Section III.G.2 for three hour rated barriers because various unlabeled, field fabricated, fire dampers are rated for 1-1/2 hours. NRC SER dated December 4, 1986 (TAC 56566) stated that Appendix R paragraph III.G.2(a) does not apply to fire area boundaries and evaluated the fire dampers as a deviation to Section D.1(j) of Appendix A to BTP APCS 9.5-1. The December 19, 1989 letter reaffirmed the commitment to replace unqualified dampers in areas with combustible loading exceeding 1-hr and also presented engineering evaluations for the remaining fire dampers. The exemption was subsequently approved by the NRC in a letter dated June 29, 1990. (BVPS-1 LA 11.19)
- An exemption was granted for the Primary Auxiliary Building/Charging Pump Cubicles (1-PA-1G, Elev. 713'-6") for the lack of required cable separation. The exemption request was transmitted by BVPS-1 letter dated January 14, 1985, and supplemented by letters dated October 16, 1985 and October 28, 1986 which modifies previous submittals for the Primary Auxiliary Building (PAB) identified in Licensing Action Nos. 3, 6, and 7. This submittal redefined the PAB as a single fire area due to interconnecting ventilation and identified separation issues with the charging pumps. Supplemental submittals were provided to support the justification for the subject configuration. The exemption approval was provided by the NRC in an SER dated December 4, 1986. (BVPS-1 LA 11.20)
- An exemption was granted for the Control Room (1-CR-1/1-CR-2) for the lack of required cable separation. The exemption request was transmitted by BVPS-1 letter dated January 14, 1985, and supplemented by letters dated October 16, 1985 and October 28, 1986. This submittal redefined CR-1 and CR-2 as a single fire area due to interconnecting ventilation system and identified redundant emergency diesel generator circuits within the fire area. Supplemental submittals were provided to support the justification for the subject configuration. The exemption was approved by the NRC in an SER dated December 4, 1986. (BVPS-1 LA 11.21)
- An exemption was granted for the Main Steam Valve Room (1-MS-1) for the lack of three hour fire barriers. The exemption request was transmitted by BVPS-1 letter dated January 14, 1985, and supplemented by letters dated October 16, 1985 and October 28, 1986. The exemption was approved by the NRC in an SER dated December 4, 1986. (BVPS-1 LA 11.22)
- An exemption was granted for the in-ability to achieve cold shutdown within 72 hours. BVPS-1 letter dated December 10, 1982 answered NRC questions and an exemption to allow BVPS-1 to take approximately 127 hours to achieve safe shutdown was granted in an NRC SER dated March 14, 1983. (BVPS-1 LA 11.23)



- An exemption was granted for process instrumentation- alternative safe shutdown capability. The exemption request was transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, November 30, 1982, December 10, 1982, and December 21, 1982. The exemption was approved by the NRC in an SER dated January 5, 1983 contingent upon approval of licensing action 11.23 to allow BVPS-1 to take approximately 127 hours to achieve safe shutdown. (BVPS-1 LA 11.24)
- An exemption was granted for the use of emergency lighting units that have less than eight hour battery capacity for access and egress routes to safe shutdown equipment. The exemption request was transmitted by BVPS-1 letter dated January 21, 1986 and supplemented by letters dated October 21, 1986. The exemption was approved by the NRC in an SER dated July 27, 1987. (BVPS-1 LA 11.25)

Branch Technical Position CMEB 9.5-1 was used in the design of BVPS-2 fire protection program for safety-related systems and equipment and for other plant areas containing fire hazards that could adversely affect safety-related systems. Redundant safety-related systems required for safe shutdown are either separated in accordance with NRC position C.5.b(2) of BTP CMEB 9.5-1 (NUREG-0800, July 1981) or a deviation was requested (if identified prior to issuance of the plant operating license) as detailed in the BVPS-2 Fire Protection Safe Shutdown Report (FPSSR). NRC Safety Evaluation Report (NUREG 1057, Supplement No. 3) included a condition of the BVPS-2 Operating License (Condition 2.F) that requires the FPP to be implemented and maintained. Following issuance of the plant operating license in August 1987, changes to the Fire Protection Program were made in accordance with Section 2.F of the operating license.

BVPS-2 UFSAR, Appendix 9.5A lists applicable elements of the fire protection program and identifies deviations from the regulatory guidelines. The following deviations are noted as having been previously granted by the NRC:

- A deviation was granted for physical examinations that are conducted every three years versus annually for members of the Fire Brigade which differs from the Branch Technical Position CMEB 9.5-1 Item C.3.b. The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 01)
- A deviation was granted for structural steel in certain areas that has not been fire proofed that supports fire barriers with a minimum fire resistance rating of three hours which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.a(1). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 6) dated August 1987. (BVPS-2 LA 02)
- A deviation was granted for conduit/penetration seals for specific conduit configurations and for sealing penetrations in fire barriers for ventilation ductwork with non-tested fire seals which differ from the Branch Technical Position CMEB 9.5-1 Item C.5.a(3). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 03)
- A deviation was granted for the installation of a non-tested configuration of two 1-1/2 hour fire rated dampers in series instead of one 3-hr fire-rated damper in ventilation penetration openings which differ from the Branch Technical Position CMEB 9.5-1 Item C.5.a(4). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 3) dated November 1986. (BVPS-2 LA 04)

- A deviation was granted for ventilation penetration openings that should be protected by fire dampers having a rating equivalent to that required of the barrier which differ from the Branch Technical Position CMEB 9.5-1 Item C.5.a(4). The deviation consisted of one-hour fire wraps for ductwork portions from the dampers to the barriers, fire wrap protection of ventilation ductwork passing both sides of the barrier, no fire wraps in ductwork penetrations for Fire Compartments between 2-SB-3 and 2-SB-4 and between 2-PA-3 and 2-PA-4, and the non-rated dampers in the gland steam exhaust ventilation ductwork between SB-5 and PA-5. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 05)
- A deviation was granted for modified fire doors and certain fire doors for areas protected by automatic total flooding gas suppression systems which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.a(5). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 06)
- A deviation was granted for transformers located within 50 feet of buildings that do not have a fire resistant rating of at least 3 hours which differ from the Branch Technical Position CMEB 9.5-1 Item C.5.a(13). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 07)
- A deviation was granted for safe shutdown components that lack the adequate separation of redundant trains which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.b. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 3 and No. 5) dated November 1986 and May, 1987. (BVPS-2 LA 08)
- A deviation was granted for the lack of redundant circuitry for safe shutdown or the lack of an alternate shutdown capability which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.b. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 09)
- A deviation was granted for lack of alternative or dedicated shutdown capability where protection or separation of systems or equipment required for safe shutdown is not adequate which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.c. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 10)
- A deviation was granted for the seismic classification (Seismic Class I) of the hydrogen piping in safety-related areas which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.d(5). The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 11)
- A deviation was granted for lack of continuous line-type heat detectors in safety-related cable trays which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.e(2). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 12)
- A deviation was granted for the fire protection features of concentrated cable tray areas in certain fire areas which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.e(2). The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 13)

- A deviation was granted for certain fire areas that use CO<sub>2</sub> as the primary automatic suppressant instead of water which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.e(2). The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 14)
- A deviation was granted for the location of the controls of the redundant ventilation systems serving the control room which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.f(3). The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 15)
- A deviation was granted for the 8-hr battery-powered emergency lighting units for access and egress routes used in performance of alternate shutdown procedures in the yard areas which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.g(1). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 16)
- A deviation was granted for fire detection coverage of areas with no combustible loading that contain safety-related equipment/cables required for safe shutdown which differs from the Branch Technical Position CMEB 9.5-1 Item C.6.a(l). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 6) dated August 1987. (BVPS-2 LA 17)
- A deviation was granted for fire hydrant spacing which differs from the Branch Technical Position CMEB 9.5-1 Item C.6.b(7). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 18)
- A deviation was granted for the fire protection features (General Area Detection) for the Reactor Containment area which differs from the Branch Technical Position CMEB 9.5-1 Item C.7.a(l)(c). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 19)
- A deviation was granted for the fire protection features for the Control Room which differs from the Branch Technical Position CMEB 9.5-1 Item C.7.b. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 20)
- A deviation was granted for the fire protection features for the Cable Spreading Room which differs from the Branch Technical Position CMEB 9.5-1 Item C.7.c. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 21)
- A deviation was granted for lack of 3-hr fire barrier separation of pump houses and rooms housing redundant safety-related pumps that differs from the Branch Technical Position CMEB 9.5-1 Item C.7.k. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 22)
- A deviation was granted for lack of automatic detection and annunciation in the new fuel storage area which differs from the Branch Technical Position CMEB 9.5-1 Item C.7.l. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 23)
- A deviation was granted for lack of automatic detection in the spent fuel pool area which differs from the Branch Technical Position CMEB 9.5-1 Item C.7.m. The

exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 24)

- A deviation was granted for lack of automatic fire suppression and detection in the radwaste and decontamination areas which differs from the Branch Technical Position CMEB 9.5-1 Item C.7.n. The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 25)
- A deviation was granted for fire detection system primary and secondary power supplies and for electrically operated control valves for automatic suppression systems which differs from the Branch Technical Position CMEB 9.5-1 Item C.6.a. The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 26)
- A deviation was granted for compliance with IEEE-383-1974 Flame Test for cable construction which differs from the FSAR Section 8.3.3. The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 27)
- A deviation was granted for storage of combustibles in emergency diesel generator room which differs from the Branch Technical Position CMEB 9.5-1 Item C.7.i. The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 28)
- A deviation was granted for the standpipe and hose system (Class III vs. Class II requirement) which differs from the Branch Technical Position CMEB 9.5-1 Item C.6.c. The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 29)
- A deviation was granted for installation of detection and three-hour barriers in lieu of sprinklers in the diesel driven fire pump areas which differs from the Branch Technical Position CMEB 9.5-1 Item C.6.c. The exemption was approved by the NRC in an SER (NUREG 1057) dated October 1985. (BVPS-2 LA 30)
- A deviation was granted for the unrated containment access hatch which differs from the Branch Technical Position CMEB 9.5-1 Item C.5.a(5). The exemption was approved by the NRC in an SER (NUREG 1057, Supp. No. 5) dated May 1987. (BVPS-2 LA 31)

## **3.0 TRANSITION PROCESS**

### **3.1 Background**

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

NEI 04-02 contains the following steps:

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

### **3.2 NFPA 805 Process**

Section 2.2 of NFPA 805 establishes the general process for demonstrating compliance with NFPA 805. This process is illustrated in Figure 3-1. It shows that except for the fundamental fire protection requirements, compliance can be achieved on a fire area basis either by deterministic or RI-PB methods. Consistent with the guidance in NEI 04-02, BVPS-1 and BVPS-2 have implemented the NFPA 805 Section 2.2 process by first determining the extent to which their current fire protection programs support findings of deterministic compliance with the requirements in NFPA 805. RI-PB methods are being applied to the requirements for which deterministic compliance could not be shown.

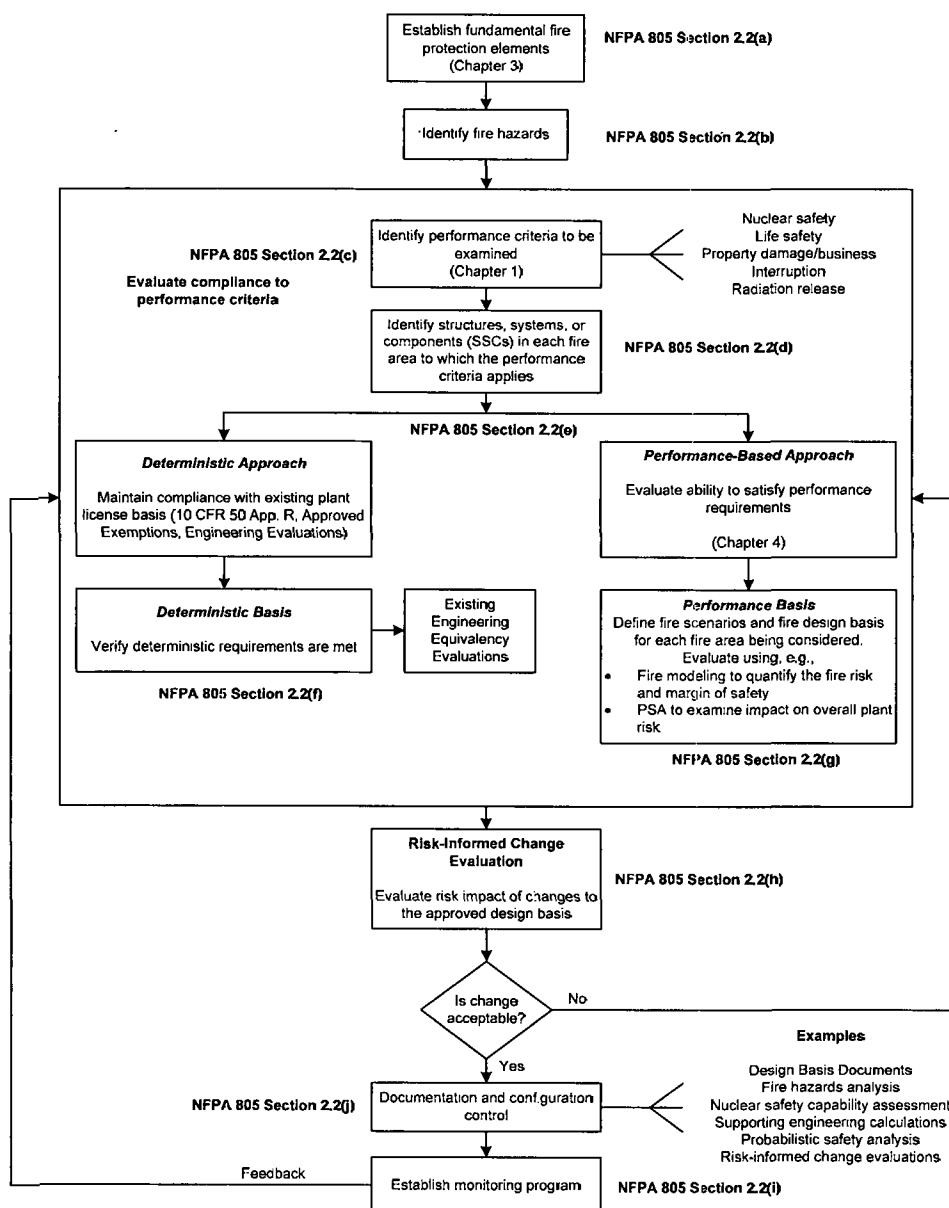


Figure 3-1 NFPA 805 Process [NEI 04-02 Figure 3-1 based on Figure 2-2 of NFPA 805]<sup>2</sup>

### 3.3 NEI 04-02 – NFPA 805 Transition Process

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

Section 4.0 of NEI 04-02 describes the detailed process for assessing a fire protection program for compliance with NFPA 805, as shown in Figure 3-2.

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

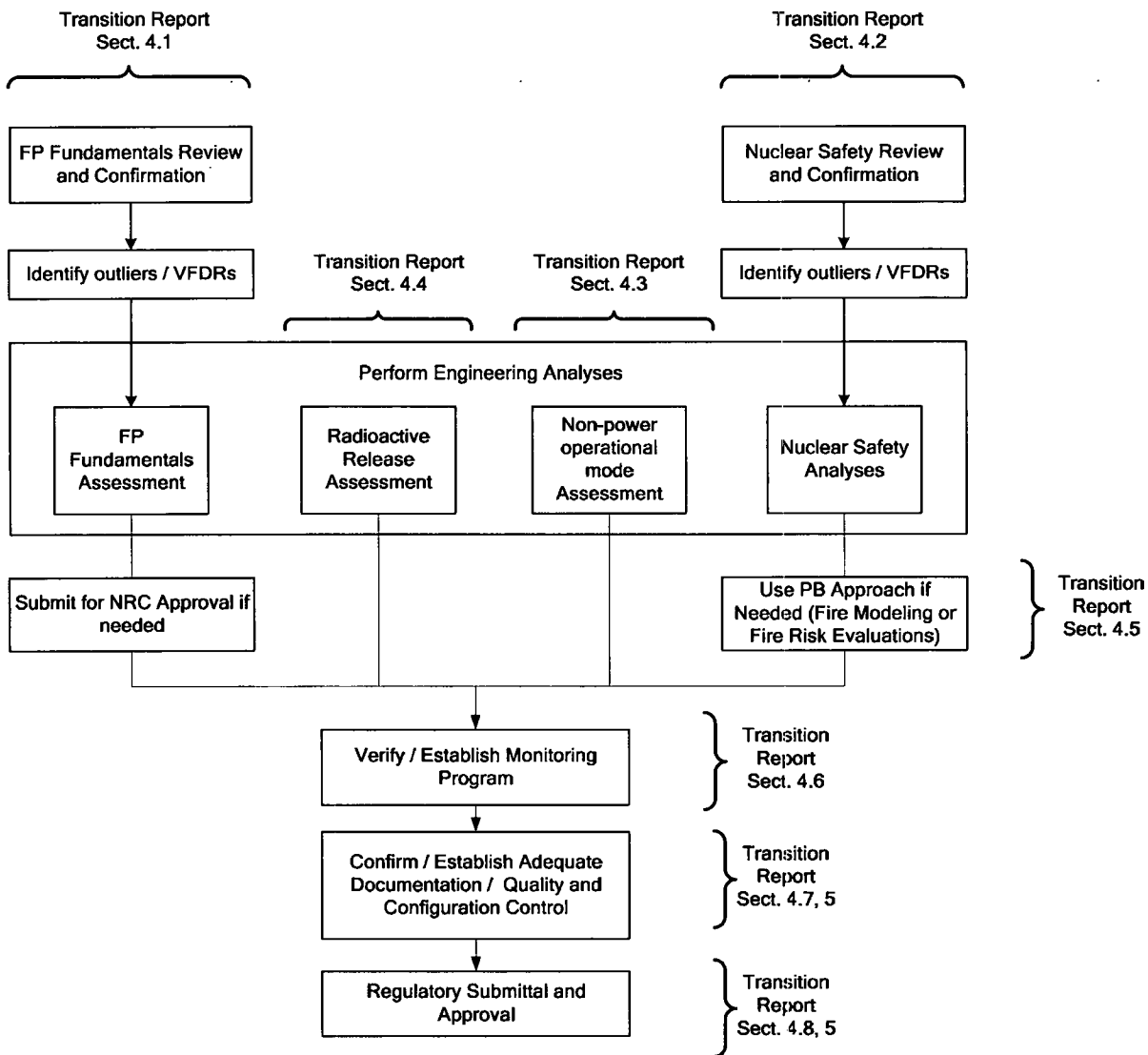


Figure 3-2 Transition Process (Simplified) [based on NEI 04-02 Figure 4-1]

### 3.4 NFPA 805 Frequently Asked Questions (FAQs)

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

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

NEI NFPA 805 Task Force and NRC reach agreement, the NRC issues a memorandum to indicate that the FAQ is acceptable. NEI 04-02 will be revised to incorporate the approved FAQs. This is an on-going revision process that will continue through the transition of NFPA 805 plants. Final closure of the FAQs will occur when future revisions of RG 1.205, endorsing the related revisions of NEI 04-02, are approved by the NRC. It is expected that additional FAQs will be written and existing FAQs will be revised as plants continue NFPA 805 transition after the Pilot Plant Safety Evaluations.

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



## 4.0 COMPLIANCE WITH NFPA 805 REQUIREMENTS

### 4.1 Fundamental Fire Protection Program and Design Elements

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

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

The Attachment A1 records demonstrate compliance for all of the NFPA Chapter 3 requirements, excluding NFPA 805 Sections 3.8.2 (Detection), 3.9 and 3.10 (Suppression), and 3.11.2, 3.11.3, 3.11.4, and 3.11.5 (Separation).

The Attachment A2 records specific to each fire compartment demonstrate compliance with NFPA 805 Sections 3.8.2 (Detection), 3.9 and 3.10 (Suppression), and 3.11.2, 3.11.3, 3.11.4, and 3.11.5 (Separation), where these features are credited to meet the performance goals of NFPA 805 Chapter 4. Based on a FENOC document review, Beaver Valley fire protection feature systems were installed based on design documents per NFPA codes and other applicable standards, but they do not have specific NFPA code evaluations. The Attachment A2 records evaluate the fire protection features for each fire compartment using the critical attributes of functionality from the applicable NFPA codes, and provide the detail necessary to meet the requirements of RAI 2-04 (Harris) and RAI 2-09 (Oconee). The Attachment A2 records provide to the docket a compliance statement for each credited fire protection feature by fire compartment instead of compliance by feature throughout the entire power block.

#### 4.1.1 Overview of Evaluation Process

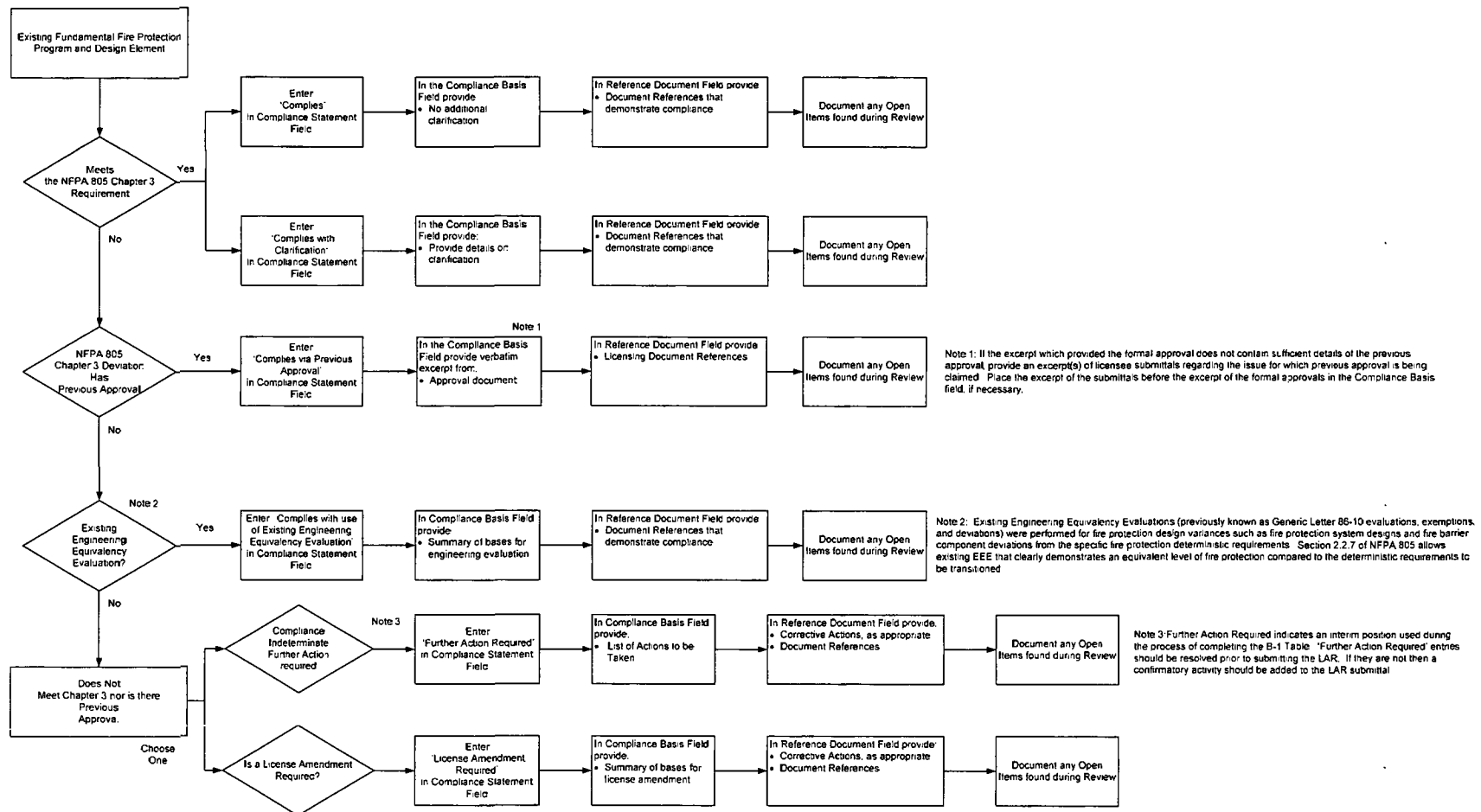
The comparison of the BVPS-1 and BVPS-2 Fire Protection Program to the requirements of NFPA 805 Chapter 3 was performed in accordance with FENOC Task Instruction ARS-PI-0001 (2601.620-000-008), "Task 1.1, Fundamental Fire Protection Program and Design Elements Transition Review," ARS-PI-0010 (2601.620-000-011), "Task 1.2 - Review of Fire Area Specific Fire Protection Features," and documented in 2701.620-000-085 titled "Fundamental Fire Protection Program and Design Element Transition Review (Task 1.1) and Review of Fire Area Specific Fire Protection Features (Task 1.2)." ARS-PI-0001 and 2701.620-000-085 used the guidance contained in NEI 04-02 Section 4.3.1 and Appendix B-1. See Figure 4-1.

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

- Complies - For those sections/subsections determined to meet the specific requirements of NFPA 805.

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

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



**Figure 4-1 - Fundamental Fire Protection Program and Design Elements Transition Process**  
**[Based on NEI 04-02 Figure 4-2]<sup>5</sup>**

<sup>5</sup> Figure 4-1 depicts the process used during the transition and therefore contains elements (i.e., open items) that represent interim resolutions. Additional detail on the transition of EEEs is included in Section 4.2.2.

#### **4.1.2 Results of the Evaluation Process**

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

Attachments A1 and A2, developed in accordance with ARS-PI-0001 (2601.620-000-008) and ARS-PI-0010 (2601.620-000-011), contain the NEI 04-02 Table B-1, "Transition of Fundamental Fire Protection Program and Design Elements." This table provides the compliance basis for the requirements in NFPA 805 Chapter 3. Except as identified in Section 4.1.2.3, Attachments A1 and A2 demonstrate that the fire protection program at BVPS-1 and BVPS-2 either:

- Complies directly with the requirements of NFPA 805 Chapter 3,
- Complies with clarification with the requirements of NFPA 805 Chapter 3,
- Complies through the use of existing engineering equivalency evaluations, which are valid and of appropriate quality,
- Complies with a previously NRC-approved alternative to NFPA 805 Chapter 3, and, therefore, the specific requirement of NFPA 805 Chapter 3 is supplanted,
- Will Comply with the Use of Commitment where there are processes that must be implemented, and/or modifications to be completed for components/systems to meet specific requirements of NFPA 805. See Attachment S for details.
- N/A is a condition where the statement after the section number is only a subject heading or a discussion with no listed requirement.

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

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

- 3.3.5.3 Clarification of compliance with a flame propagation test as acceptable to the AHJ for electric cable construction. (BVPS-1 SER dated June 6, 1979)
- 3.8.1 Clarification of compliance with NFPA 72 for secondary power supply arrangement. (BVPS-2 LA 26)
- 3.9.1 Clarification of compliance with fixed suppression systems for fire protection. (BVPS-1 LA 11.02 and BVPS-2 LA 06 and 08)
- 3.9.4 Clarification for protection of diesel-driven pump by automatic sprinklers. (BVPS-2 LA 30)
- 3.11.2 Clarification of existing fire barriers meeting fire loading. (BVPS-1 LA 11.02, 11.10, and 11.17)
- 3.11.4 Clarification for fire damper and fire wrap arrangements capable of maintaining the fire resistance of the fire barrier. (BVPS-1 LA 11.05 and BVPS-2 LA 04 and 05)

Although not related to Chapter 3 Requirements, BVPS-1 LA 11.02 and 11.16 clarification of prior NRC approval that all Reactor Containment cables are routed in conduit is also being requested.

The discussion of the prior approvals of NFPA 805 Chapter 3 program attributes for Beaver Valley including appropriate reference documents, is provided in Attachment T.

#### **4.1.2.3 NFPA 805 Chapter 3 Requirements Not Previously Approved by NRC**

The following sections of NFPA 805, Chapter 3 are not specifically met nor do previous NRC approvals of alternatives exist for BVPS-1 and BVPS-2:

- 3.3.5.1 - Approval is requested for presence of cables located above the suspended ceilings which do not meet the requirements.
- 3.3.12(1) - Approval is requested for reactor coolant pumps (RCP) oil misting.
- 3.3.12(4) - Approval is requested for reactor coolant pumps (RCP) oil misting.
- 3.5.11 - Approval is requested for the lack of sectional isolation valves between sprinkler system and manual hose station connections.
- 3.5.14 - Approval is requested for the lack of electrical supervision on fire hydrant curb box type control valves.

The specific deviation and a discussion of how the alternative satisfies 10 CFR 50.48(c)(2)(vii) requirements are provided in Attachment L. BVPS-1 and BVPS-2 request NRC approval of these items.

#### **4.1.3 Definition of Power Block and Plant**

Where used in NFPA 805 Chapter 3 and in NEI 04-02, Section K.2, "NFPA 805 Chapter 3 'Power Block or Plant' (FAQ 06-0019, ML080510224)," the terms "Power Block" and "plant" refer to structures that have equipment required for nuclear plant operations, such as Containment, Auxiliary Building, Service Building, Control Building, Fuel Building, Radioactive Waste, Water Treatment, Turbine Building, and Intake Structures, or structures that are identified in the facility's pre-transition licensing basis.

In support of the BVPS-1 and BVPS-2 LAR, an assessment of the current licensing bases (CLB) was performed to identify the power block structures and fire compartments to be included in Attachment I for the LAR. This report is constructed in accordance with the NFPA 805, the NEI 04-02 guidance, and 10 CFR 50.48(c).

NFPA 805 states in Section 1.6.46, "Power Block. Structures that have equipment required for nuclear plant operations." NFPA 805 specifies additional requirement for "Power Block Buildings" in other sections.

The process used the following documents to classify the plant's structures and fire compartments:

- A review of safe shutdown areas from Chapter 4 of the safe shutdown reports ("Updated Fire Protection Appendix R Review" (UFPARR) for BVPS-1 and "Fire Protection Safe Shutdown Report" (FPSSR) for BVPS-2) to identify the pre-transition fire areas or compartments.

- A review of plant areas in the "NFPA 805 - Radioactive Release Transition Review Guidance" (NEI 04-02, Table G-1) to identify areas that have the potential for radioactive release.
- A review of the "Plant Area Boundary & Partitioning Calculation" to identify fire compartments that were included within the global plant analysis boundaries.

The identified structures and compartments were then analyzed for inclusion into the "Power Block." These structures are listed in Attachment I and define the "Power Block" and "plant." Some fire compartments are included in the Power Block for consistency with NEI 04-02, or due to review in Attachment E, Radiological Release, but they do not credit any fire protection features or systems in LAR Table 4-3. These compartments are generally tanks in the yard, or compartments apart from those containing safe shutdown equipment.

## **4.2 Nuclear Safety Performance Criteria**

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

### **4.2.1 Nuclear Safety Capability Assessment Methodology**

The Nuclear Safety Capability Assessment (NSCA) Methodology review consists of four processes:

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

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

#### **4.2.1.1 Compliance with NFPA 805 Section 2.4.2**

##### **Overview of Process**

NFPA 805 Section 2.4.2 Nuclear Safety Capability Assessment states:

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

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

- (3) Identification of the location of nuclear safety equipment and cables*
- (4) Assessment of the ability to achieve the nuclear safety performance criteria given a fire in each fire area*

The NSCA methodology review evaluated the BVPS-1 and BVPS-2 safe shutdown analysis methodologies and procedures, plus the NFPA 805 transition safe shutdown reports against the guidance provided in NEI 00-01, Revision 1, Chapter 3, "Deterministic Methodology," as discussed in Appendix B-2 of NEI 04-02. The NFPA 805 transition safe shutdown analyses began with the pre-transition licensing basis analyses and added additional information (for example, an evaluation of offsite power availability, and updates based on multiple spurious operations). The methodology is depicted in Figure 4-2 and consisted of the following activities:

- Each specific section of NFPA 805 2.4.2 was correlated to the corresponding section of Chapter 3 of NEI 00-01, Revision 1. Based upon the content of the NEI 00-01 methodology statements, a determination was made of the applicability of the section to the station.
- The plant-specific methodology was compared to applicable sections of NEI 00-01 and one of the following alignment statements and its associated basis were assigned to the section:
  - Aligns
  - Aligns with Intent
  - Not in Alignment
  - Not in Alignment, but Prior NRC Approval
  - Not in Alignment, but no adverse consequences
  - Not Applicable
- For those sections that do not align, an assessment was made to determine if the failure to maintain strict alignment with the guidance in NEI 00-01 could have adverse consequences. Since NEI 00-01 is a guidance document, portions of its text could be interpreted as "good practice" or intended as an example of an efficient means of performing the analyses. If the section has no adverse consequences, these sections of NEI 00-01 can be dispositioned without further review.

The comparisons of the Beaver Valley safe shutdown analyses to NEI 00-01, Chapter 3 (NEI 04-02 Table B-2) were performed and documented in 2701.620-000-014, "Nuclear Safety Capability Assessment Methodology Review (Table B-2)."

In addition, a review of NEI 00-01, Revision 2, Chapter 3, was conducted against the following substantive changes applicable to an NFPA 805 fire protection program in the guidance from NEI 00-01, Revision 1. This review was performed and documented in Attachment 10 to 2701.620-000-014, "Nuclear Safety Capability Assessment Methodology Review (Table B-2)."

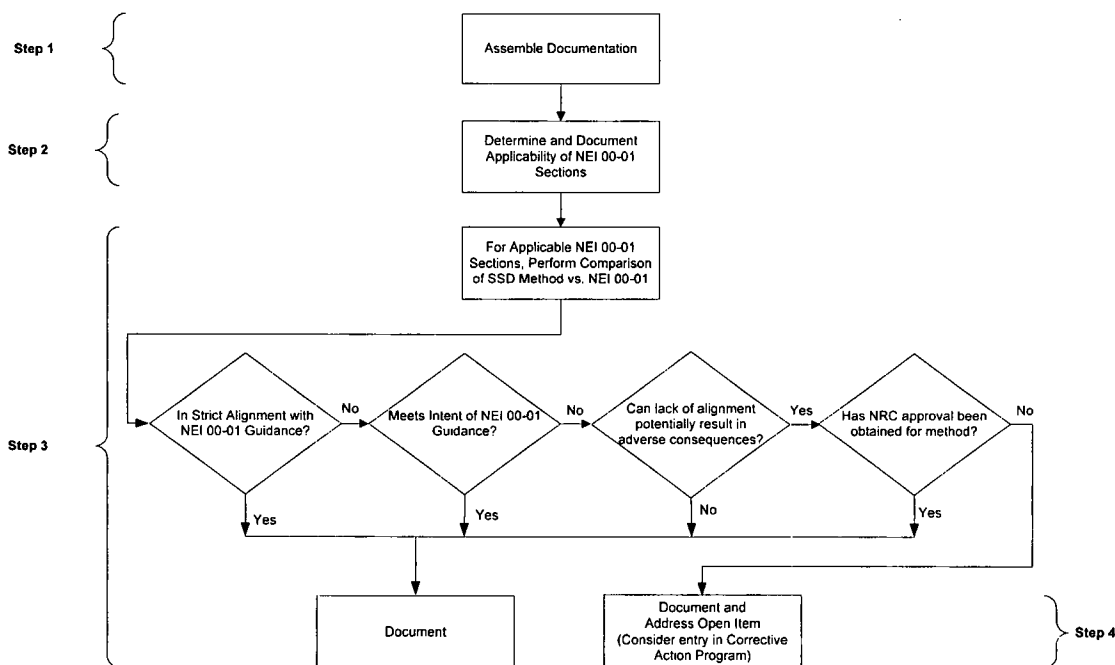
### **Results from Evaluation Process**

The method used to perform the safe shutdown analyses reviews with respect to selection of systems and equipment, selection of cables, and identification of the location of equipment and cables, either meets the NRC endorsed guidance from NEI 00-01,

Revision 1, Chapter 3 directly or met the intent of the endorsed guidance with adequate justification as documented in Attachment B with the following exceptions:

- Open-Circuited Current Transformers

An analysis of high voltage current transformers at Beaver Valley has been performed. Attachment 2 of 2701.620-000-025, "Current Transformer Investigation for Beaver Valley Power Station," lists the components that have a cable with conductors connected to a current transformer circuit and leave the switchgear enclosure unprotected. Any modifications required will be determined when the guidance is finalized as to which current transformers pose a credible risk of secondary damage upon an open circuit.



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

### Comparison to NEI 00-01 Revision 2

An additional review was performed of NEI 00-01, Revision 2, Chapter 3, for specific substantive changes in the guidance from NEI 00-01, Revision 1 that are applicable to an NFPA 805 transition. The results of this review are summarized below:

- Post fire manual operation of rising stem valves in the fire area of concern (NEI 00-01 Section 3.2.1.2)

A review and evaluation of recovery actions was performed. The process followed the guidance provided in NEI-04-02, and the FAQ 07-0030 and included the determination of feasibility/reliability of the operator manual actions. Where feasibility reviews called into question use of manual valves in the fire compartment after the fire was extinguished, the recovery strategy was modified to ensure recovery actions could be successfully and reliably credited.



- Analysis of open circuits on a high voltage (e.g., 4.16 kV) ammeter current transformers (NEI 00-01 Section 3.5.2.1)

An analysis of high voltage current transformers at Beaver Valley has been performed. Attachment 2 of 2701.620-000-025, "Current Transformer Investigation for Beaver Valley Power Station," lists the components that have a cable with conductors connected to a current transformer circuit and leave the switchgear enclosure unprotected. Any modifications required will be determined when the guidance is finalized as to which current transformers pose a credible risk of secondary fires upon an open circuit.

- Analysis of control power for switchgear with respect to breaker coordination (NEI 00-01 Section 3.5.2.4)

Procedure 8700-01.062-0008, "Post-Fire Safe Shutdown and PRA Systems and Component Selection," Section 8.2 details the types of circuit components included in the SAFE analysis, including electrical power and control, instrumentation, instrument air, cooling and ventilation. Control power for overcurrent trip protection has been considered for breakers attached to a credited bus, and VFDRs identified when appropriate, as indicated in Attachment C.

#### 4.2.1.2 Safe and Stable Conditions for the Plant

##### Overview of Process

The nuclear safety goals, objectives and performance criteria of NFPA 805 allow more flexibility than the previous deterministic fire protection programs for BVPS-1 and BVPS-2 since NFPA 805 requires the licensee to maintain the reactor fuel in a safe and stable condition rather than to achieve and maintain cold shutdown.

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

*For fuel in the reactor vessel, head on and tensioned, safe and stable conditions are defined as the ability to maintain  $K_{eff} < 0.99$ , 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.*

The nuclear safety goal of NFPA 805 requires "...reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition" without a specific reference to a mission time or event coping duration.

For the plant to be in a safe and stable condition, it may not be necessary to perform a transition to cold shutdown as required by the previous deterministic fire protection program. Therefore, the affected unit(s) may remain at or below the temperature defined by a hot standby plant operating state for the event.

##### Results

Demonstration of the Nuclear Safety Performance Criteria for safe and stable conditions was performed in two analyses at BVPS-1 and BVPS-2:

- At-Power analysis, Modes 1 through Mode 3. This analysis is discussed in Section 4.2.4.

- Non-Power analysis, which includes Mode 4 and below. This analysis is discussed in Section 4.3.

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

As part of the transition to NFPA 805, each fire compartment was evaluated for maintaining safe and stable Hot Standby conditions. The evaluation has determined that BVPS-1 and BVPS-2 can achieve and maintain safe and stable conditions with the minimum shift operating staff. The PPDWSTs can supply the Auxiliary Feedwater (AFW) pumps for at least nine hours after shutdown. Refilling the PPDWSTs can be accomplished by transferring water from the Demineralized Water Storage Tanks (DWSTs) via pumps for BVPS-1 and gravity feed for BVPS-2. As a long-term backup, water from the Ohio River can be manually aligned to the AFW pumps from the River Water (RW) System for BVPS-1 or the Service Water (SW) System for BVPS-2. The necessary valve manipulations to align these sources have adequate procedural guidance and are within the skills and training of the minimum shift operating staff.

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

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

- Additional procedures, maintenance instructions, and work orders can be written, planned, and reviewed prior to implementation. These process controls are very event-specific to the extent that it has been judged to not be useful to develop them in advance due to the limitless spectrum of possibilities.

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

- Reactivity Control

BVPS-1 and BVPS-2 reactor core design ensures that  $K_{eff}$  is maintained  $<0.99$  while the plant is in a safe and stable condition including compensation for any positive reactivity increases as a result of Xenon-135 decay and reactor coolant temperature decreases. Gravity insertion of the control rods into the reactor core will ensure reactivity control is achieved.

Reactor Coolant System (RCS) makeup will be from the Refueling Water Storage Tank (RWST), which is a borated source that will ensure the  $K_{eff}$  is maintained  $<0.99$  in all operating and non-operating modes.

- Inventory and Pressure Control

Inventory makeup to the RCS will be required to account for nominal RCS leakage and RCS shrinkage due to cooldown as well as RCP seal injection. BVPS-1 and BVPS-2 have design features and procedures to ensure that an adequate source of borated inventory is provided for RCS inventory control from the RWST utilizing the Chemical Volume Control System (CVCS) and High Head Safety Injection (HHSI) System. If RWST inventory is depleted, it will be refilled using a combination of makeup from the spent fuel pool or boric acid storage tanks and primary grade water through the blender.

With fuel in the reactor vessel, head on tensioned, BVPS-1 and BVPS-2 have design features and procedures to ensure inventory and pressure control shall be capable of controlling coolant level such that subcooling is maintained for a PWR and shall be capable of maintaining reactor water level such that fuel cladding damage as a result of a fire is prevented.

BVPS-1 and BVPS-2 have design features and procedures to ensure that excess RCS inventory is released from the RCS utilizing the Reactor Pressure Vessel Head Vent Valves.

BVPS-1 and BVPS-2 have design features and procedures to ensure that excess RCS pressure relief is provided utilizing one of three Power-Operated Relief Valves (PORVs).

- Decay Heat Removal

BVPS-1 and BVPS-2 have design features and procedures to ensure reactor core decay heat will be rejected to the secondary plant through the steam generators. The heat will be rejected to the atmosphere through the Atmospheric Dump Valves (ADVs) or Residual Heat Release (RHR) valve.

BVPS-1 and BVPS-2 have design features and procedures to provide adequate Auxiliary Feedwater (AFW) to the credited steam generators for decay heat removal.

- Vital Auxiliaries - Power and Support Systems

Each EDG is provided with a storage tank having a fuel oil capacity sufficient to operate that diesel for a period of seven days while the EDG is supplying continuous rating load demand. The EDG will provide power to the shutdown equipment for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal and Process Monitoring. Each EDG will also provide power to the other vital auxiliary systems, including RW/SW and heating, ventilation, air conditioning and cooling (HVAC).

- Process Monitoring

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

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

BVPS-1 and BVPS-2 NPO Assessment provides reasonable assurance the reactor fuel is maintained in a safe and stable condition for fires which may occur in Mode 4 (Hot Shutdown), Mode 5 (Cold Shutdown) and Mode 6 (Refueling). Refer to LAR Section 4.3 and Attachment D for a description of the BVPS-1 and BVPS-2 NPO Assessment for fires that occur in the non-power operational modes.

#### **4.2.1.3 Establishing Recovery Actions**

##### **Overview of Process**

NEI 04-02 and RG 1.205 suggest that a licensee submit a summary of its approach for addressing the transition of Operator Manual Actions (OMAs) as recovery actions in the LAR (Regulatory Position 2.2.1 and NEI 04-02, Section 4.6). As a minimum, NEI 04-02 suggests that the assumptions, criteria, methodology, and overall results be included for the NRC to determine the acceptability of the licensee's methodology.

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

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

##### **Results**

The review results are documented in 8700-01.062-0043, "BVPS Unit 1 Fire Protection Safe Shutdown Operator Manual Action Feasibility Study" and 2701.620-000-049, "BVPS Unit 2

Fire Protection Safe Shutdown Operator Manual Action Feasibility Study.” Refer to Attachment G for the detailed evaluation process and summary of the results from the process.

#### **4.2.1.4 Evaluation of Multiple Spurious Operations**

##### **Overview of Process**

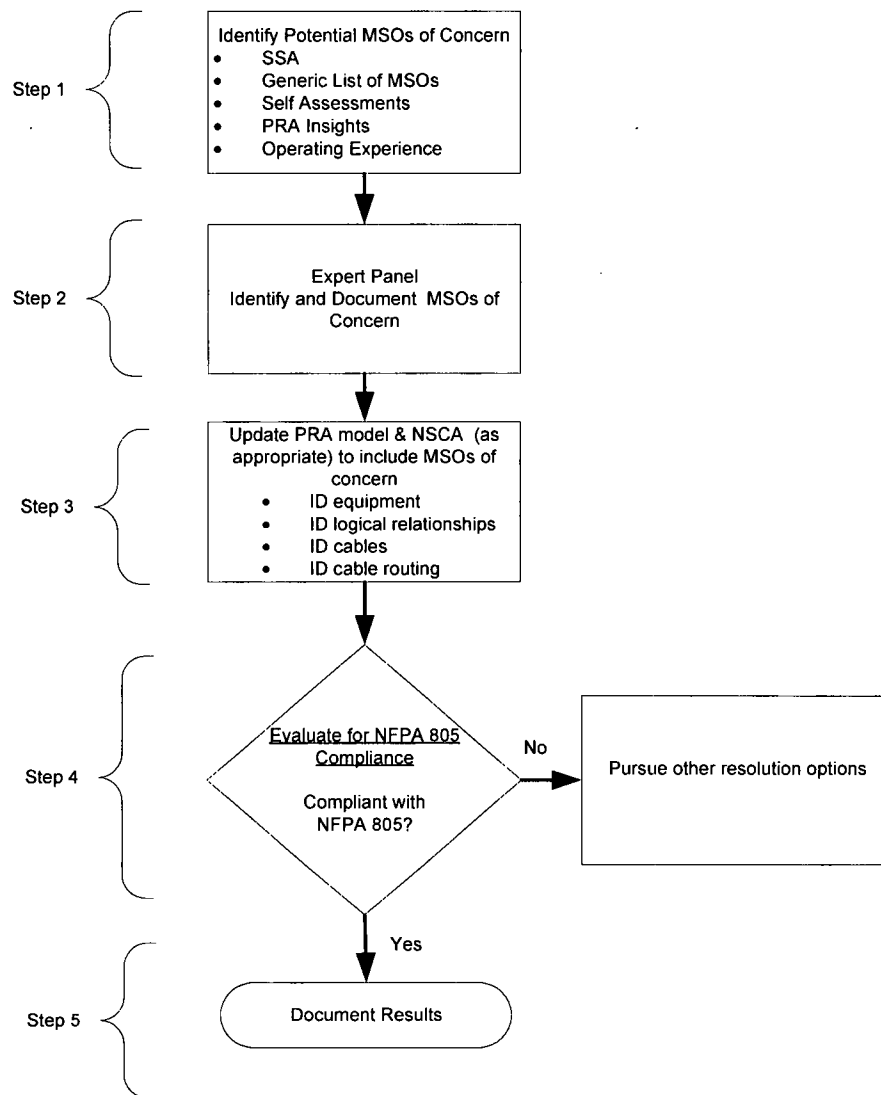
NEI 04-02 suggests that a licensee submit a summary of its approach for addressing potential fire-induced Multiple Spurious Operations (MSOs) for NRC review and approval. As a minimum, NEI 04-02 suggests that the summary contain sufficient information relevant to methods, tools, and acceptance criteria used to enable the NRC to determine the acceptability of the licensee’s methodology. The methodology utilized to address MSOs for BVPS-1 and BVPS-2 is summarized below.

As part of the NFPA 805 transition project, a review and evaluation of BVPS-1 and BVPS-2 susceptibility to fire-induced MSOs were performed. The process was conducted in accordance with NEI 04-02 and RG 1.205, as supplemented by FAQ 07-0038, Revision 3 (ML110140242). The PWR Generic MSO list Revision 2.1 dated March 2011 was utilized.

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

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

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



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

## Results

Refer to Attachment F for the process used by BVPS-1 and BVPS-2 and the results from the process.

### 4.2.2 Existing Engineering Equivalency Evaluation Transition

#### Overview of Evaluation Process

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

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

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

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

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

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

## Results

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

- 8700-01.062-0049, Revision A, “Review of Existing Engineering Equivalency Evaluations Report” [Unit 1]
- 2701.620-000-110, Revision A, “Review of Existing Engineering Equivalency Evaluations Report” [Unit 2]

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

In addition, none of the transitioning EEEEs require NRC approval.

### 4.2.3 Licensing Action Transition

#### Overview of Evaluation Process

The existing licensing actions exemptions/deviations review was performed in accordance with NEI 04-02. The methodology for the licensing action review included the following:

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

## Results

Attachment K contains the detailed results of the Licensing Action Review for BVPS-1 and BVPS-2.

The following licensing actions will be transitioned into the NFPA 805 fire protection program as previously approved (NFPA 805 Section 2.2.7). These licensing actions are considered compliant under 10 CFR 50.48(c).

**BVPS-1**

- Licensing Action 11.02 - Reactor Containment (1-RC-1) - Lack of 20 foot separation (III.G.2 criteria).
- Licensing Action 11.05 - Cable Tunnel (1-CV-3) - Lack of 20 foot separation (III.G.2 criteria).
- Licensing Action 11.09 - Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of 3-hour fire barriers (III.G.2 criteria). The exemption portion for lack of automatic suppression will not be transitioned to NFPA 805.
- Licensing Action 11.10 - Process Instrumentation Room (1-CR-4) - Lack of 3-hour fire barriers (III.G.2 criteria). The exemption portion for lack of automatic suppression will not be transitioned to NFPA 805.
- Licensing Action 11.16 - Reactor Containment (1-RC-1) - Lack of 20 foot separation of redundant trains of circuits associated with source range monitoring within Containment (III.G.2 criteria).
- Licensing Action 11.17 - Cable Spreading Room (1-CS-1) - Lack of 3-hour barriers (III.G.2 criteria). The exemption portion for water suppression will not be transitioned to NFPA 805.
- Licensing Action 11.18 - Fire Doors - Lack of 3-hour barriers (III.G.2 criteria).
- Licensing Action 11.24 - Process Instrumentation - Alternative shutdown capability (III.G.3 and III.L criteria). Only the source range instrument drawer at the backup indicating panel will be transitioned to NFPA 805.

**BVPS-2**

- Licensing Action 03 - Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3).
- Licensing Action 04 - Ventilation Penetration Openings (Fire Dampers) - Lack of appropriate fire dampers - BTP C.5.a(4).
- Licensing Action 05 - Fire Dampers and Ventilation Ductwork - Assembly location and deviation in ductwork 1-hour fire wrap - BTP C.5.a(4).
- Licensing Action 06 - Fire Doors - Modification of fire door assemblies - BTP C.5.a(5)
- Licensing Action 08 - Safe Shutdown Components - Lack of separation of redundant trains - BTP C.5.b The following safe shutdown components will be transitioned:
  - (1) Charging Pumps
  - (11) Equipment Inside Containment
- Licensing Action 11 - Hydrogen Piping - Deviation in seismic classification - BTP C.5.d(5).
- Licensing Action 18 - Fire Hydrant - Deviation in spacing - BTP C.6.b(7).



- Licensing Action 26 - Fire Detection System Secondary Power Supplies - Use of plant emergency power supply - BTP C.6.a(6).
- Licensing Action 27 - Cable Construction - Lack of compliance with IEEE-383-1974 flame test.
- Licensing Action 29 - Standpipe and Hose Systems - Class II versus class III requirement - BTP C.6.c.
- Licensing Action 30 - Intake Structure - Detection and 3-hour barriers versus sprinklers - BTP C.6.c.
- Licensing Action 31 - Access Hatch - Unrated containment hatch - BTP C.5.a(5).

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

#### BVPS-1

- Licensing Action 11.01 - Control Room (1-CR-1) - Lack of automatic suppression (III.G.3 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.03 - Blender Room (1-PA-1G) - Lack of 20 foot separation and automatic suppression and detection (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.04 - Pipe Tunnel (1-PT-1) - Lack of 20 foot separation and automatic suppression and detection (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.06 - Primary Auxiliary Building (1-PA-1G) - Lack of 20 foot separation and automatic suppression and detection (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.07 - Primary Auxiliary Building (1-PA-1A) - Lack of automatic suppression and detection (III.G.3 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.08 - Control Room HVAC Equipment Room (1-CR-2) - Lack of automatic suppression (III.G.3 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.09 - Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of automatic suppression (III.G.3 criteria) and lack of 3-hour fire barriers (III.G.2 criteria). Conformance with the Appendix R exemption bases reached with the NRC regarding Emergency Switchgear Rooms (1-ES-1 and 1-ES-2), Elevation 713'; lack of automatic suppression (III.G.3 criteria) and lack of 3-hour fire barriers (III.G.2 criteria) as stated in the NRC SERs dated March 14, 1983, and August 30, 1984, was verified. Automatic suppression in these two Fire Compartments is not required

by performance-based analysis NFPA 805; therefore, approval for automatic suppression portion of the licensing action is no longer necessary. The exemption for lack of 3-hour Fire Barriers (III.G.2 criteria) for the Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) is being transitioned to the new licensing basis under NFPA 805.

- Licensing Action 11.10 - Process Instrument Room (1-CR-4) - Lack of automatic suppression (III.G.3 criteria) and lack of 3-hour fire barriers (III.G.2 criteria). Conformance with the Appendix R exemption bases reached with the NRC regarding Process Instrument Room (1-CR-4) Elevation 713'; lack of automatic suppression (III.G.3 criteria), and lack of 3-hour fire barriers (III.G.2 criteria) as stated in NRC SER dated August 30, 1984, was verified. Automatic suppression in the Fire Compartment is not required by performance-based analysis NFPA 805; therefore, approval for automatic suppression portion of the licensing action is no longer necessary. The exemption for lack of 3-hour fire barriers (III.G.2 criteria) for the Process Instrument Room (1-CR-4) is being transitioned to the new licensing basis under NFPA 805.
- Licensing Action 11.11 - Communication Equipment and Relay Panel Room (1-CR-3) - Lack of automatic suppression (III.G.3 criteria) and lack of 3-hour fire barriers (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.12 - Normal Switchgear Room (1-NS-1) - Lack of automatic suppression (III.G.3 criteria) and lack of 3-hour fire barriers (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.13 - Service Building Structural Steel (Area Below 1-CS-1) - Lack of fire protection for structural steel (III.G.2a criteria). Compliance with III.G.2a criteria was established by completing plant modifications to provide protection for the subject structural steel; therefore, this licensing action was previously withdrawn.
- Licensing Action 11.14 - Carbon Dioxide Storage/PG Pump Room (1-CO-2) - Lack of automatic suppression and detection (III.G.3 criteria). Safe shutdown circuits and equipment have been removed from fire compartment (1-CO-2) due to plant modifications; therefore, this licensing action is no longer necessary.
- Licensing Action 11.15 - Pipe Tunnel (Subarea 1-QP-1) - Lack of automatic suppression (III.G.3 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.17 - Cable Spreading Room (1-CS-1) - Lack of 3-hour fire barriers (III.G.2 criteria). Conformance with the Appendix R exemption bases reached with the NRC regarding Cable Spreading Room (1-CS-1), Elevation 725'-6"; lack of 3-hour barriers (III.G.2 criteria), as stated in the NRC SER dated August 30, 1984, was verified. It also included an exemption for water suppression; however since CO2 suppression is available to meet the performance-based analysis and is allowed by NFPA 805, the suppression portion of the licensing action is no longer necessary. The exemption for lack of 3-hour fire barriers (III.G.2 criteria) for the

Cable Spreading Room (1-CS-1) is being transitioned to the new licensing basis per NFPA 805.

- Licensing Action 11.19 - Fire Dampers - Lack of 3-hour fire barriers (III.G.2 criteria). Engineering evaluations (FPPCE 12-024) have concluded that the fire barrier duct penetrations between fire compartments with a fire duration of less than 1-hour are acceptable and adequate for the hazard. The fire dampers are not required to maintain separation between the fire compartments; therefore, this licensing action is no longer necessary.
- Licensing Action 11.20 - Primary Auxiliary Building/Charging Pump Cubicles (1-PA-1G and 1-PA-1GA, 1-PA-1GB, and 1PA-1GC) - Lack of 20 foot separation (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.21 - Control Room (1-CR-1/1-CR-2) - Lack of 20 foot separation (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.22 - Main Steam Valve Room (1-MS-1) - Lack of 3-hour fire barriers (III.G.2 criteria). The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 11.23 - Control Room (1-CR-1) - 72-hour cold shutdown requirement (III.L criteria). Per NFPA 805, Section 1.3.1, the nuclear safety goal is to provide reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition. For BVPS-1 it will not be necessary to perform a transition to cold shutdown, as currently required under 10 CFR 50, Appendix R, to be in a safe and stable condition; therefore, this licensing action is no longer necessary.
- Licensing Action 11.24 - Process Instrumentation - Alternative shutdown capability (III.G.3 criteria and III.L criteria). Any required control room instrumentation that is potentially unavailable after a fire has been addressed through variances from deterministic requirements and evaluated in the fire risk evaluations. Cable analysis indicates that the necessary instruments will be available at the backup indication panel (BIP) when the control room indicators are compromised. Only the exemption related to the source range instrument drawer installation time at the BIP is being transitioned to the new licensing basis per NFPA 805.
- Licensing Action 11.25 - Emergency Lighting - Lack of 8-hour battery powered emergency lighting units (III.J criteria). An 8-hour battery powered emergency lighting is no longer required by NFPA 805; therefore, this licensing action is no longer necessary.

Since the exemptions are either compliant with 10 CFR 50.48(c) or no longer necessary, in accordance with the requirements of 10 CFR 50.48(c)(3)(i), BVPS-1 requests that the exemptions listed in Attachment K be rescinded as part of the LAR process. It is FENOC's understanding that implicit in the superseding of the current license condition, all prior fire

protection program Safety Evaluation Reports and commitments will be superseded in their entirety. See Attachment O, Orders and Exemptions.

#### BVPS-2

- Licensing Action 01 - Fire Brigade - Annual physical examinations - BTP C.3.b. Compliance with criteria was established to provide annual physical examinations of the fire brigade members; therefore, this licensing action is no longer necessary.
- Licensing Action 02 - Structural Steel - Lack of structural steel fireproofing - BTP C.5.a(1). Each of the walls consists of a block wall, with structural steel on the building interiors for support of the building roofs. The wall in the Turbine Building extends on above the block wall, with a metal siding wall to the exterior. If the steel were to deform due to fire, the exterior metal wall and roof would be impacted, but the block wall would remain intact. The compartment barriers meet the 3-hour rated barrier requirement, and the project has done a review of structural steel to ensure that the risk of any steel failures has been addressed within the PRA model; therefore, this licensing action is no longer necessary.
- Licensing Action 07 - Outdoor Transformers - Deviation in location and lack of building wall 3-hour fire resistance - BTP C.5.a(13). The outdoor transformers were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 08 - Safe Shutdown Components - Lack of separation of redundant trains - BTP C.5.b. Portions of Licensing Action 08 associated with the following safe shutdown components will not be transitioned to NFPA 805:
  - (2) Component Cooling Water Pumps
  - (3) Boric Acid Transfer Pumps and Storage Tanks
  - (4) Charging System Control Valves
  - (5) Emergency Switchgear Supply and Exhaust Fans
  - (6) Emergency Switchgear Supply and Exhaust Dampers
  - (7) Emergency Exhaust Fans
  - (8) Auxiliary Feedwater Control Valves
  - (9) Atmospheric Steam Dump Valves
  - (10) Main Steam Isolation Valves

These items have been evaluated as part of the NFPA 805 program and it was determined that the approval for items 2-10 is no longer required.

- Licensing Action 09 - Safe Shutdown Circuitry - Lack of separation of redundant trains - BTP C.5.b. The safe shutdown circuitry was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 10 - Alternative or Dedicated Safe Shutdown Capability - Deviation when protection or separation is not adequate - BTP C.5.c(7). The dedicated safe shutdown capability was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

- Licensing Action 12 - Continuous Line-Type Heat Detectors - Deviation for alternative fire detection - BTP C.5.e(2). Ionization heat detectors are acceptable alternatives and continuous-line type of heat detection is no longer required by NFPA 805; therefore, this licensing action is no longer necessary.
- Licensing Action 13 - Concentrated Cable Trays in Reactor Containment and Auxiliary Building - Deviation for fire protection features - BTP C.5.e(2). The concentrated cable trays were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 14 - Cable Rooms - CO2 versus water fire suppressant - BTP C.5.e(2). The cable spreading room was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 15 - Control Room Ventilation - Deviation in the redundant ventilation system control location - BTP C.5.f(3). The redundant ventilation system control location is no longer required by NFPA 805; therefore, this licensing action is no longer necessary.
- Licensing Action 16 - Lighting of Yard Areas - Lack of 8-hour battery-powered lights - BTP C.5.g(1). An 8-hour battery-powered light in the yard area is no longer required by NFPA 805; therefore, this licensing action is no longer necessary.
- Licensing Action 17 - Fire Detection - Lack of detection in areas with no combustible loadings - BTP C.6.a(1). Detection systems for areas that contain or present a fire exposure to safety-related equipment are no longer required by NFPA 805; therefore, this licensing action is no longer necessary.
- Licensing Action 19 - Containment - Lack of general area detection - BTP C.7.a(1)(c). The general area detection features in the Reactor Containment area were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 20 - Control Room - Deviation in fire protection features - BTP C.7.b. The fire protection features in the Control Room were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 21 - Cable Spreading Room - Deviation in fire protection features - BTP C.7.c. The fire protection features in the Cable Spreading Room were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 22 - Safety-Related Pumps - Lack of 3-hour fire barriers - BTP C.7.k. The safety-related pumps were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 23 - New Fuel Area - Lack of detection - BTP C.7.l. The new fuel area was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

- Licensing Action 24 - Spent Fuel Pool Area - Lack of detection - BTP C.7.m. The spent fuel area was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 25 - Radwaste and Decontamination Areas - Lack of fire suppression and detection - BTP C.7.n. The radwaste and decontamination areas were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.
- Licensing Action 28 - Bulk Storage of Flammable Liquids - Deviation from NFPA 30 requirements - BTP C.7.i. The diesels and their day tanks were constructed consistent with NFPA 30; therefore, this licensing action is no longer necessary.

BVPS-2 was licensed to operate after January 1, 1979, and as such 10 CFR 50 Appendix R is not applicable and exemptions from the regulation were not necessary. Since the deviations are either compliant with 10 CFR 50.48(c) or no longer necessary, as discussed in Attachment M, upon issuance of the new 10 CFR 50.48(c) license condition, the current BVPS-2 license condition will be superseded. It is FENOC's understanding that implicit in the superseding of the current license condition, all prior fire protection program Safety Evaluation Reports and commitments will be superseded in their entirety.

#### **4.2.4 Fire Area Transition**

##### **Overview of Evaluation Process**

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

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

Step 2 - Documented fulfillment of nuclear safety performance criteria.

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

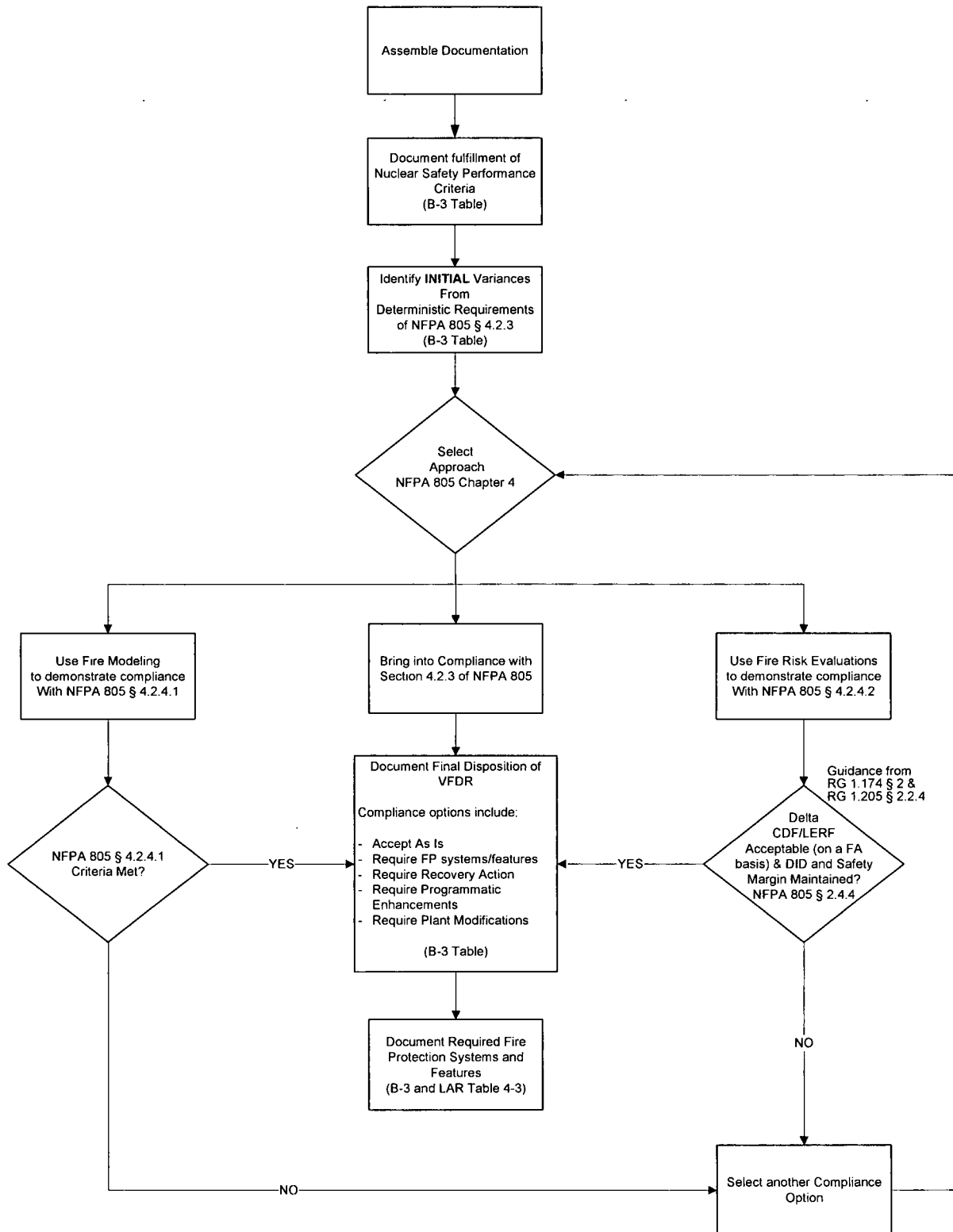
Step 3 - VFDR Identification and characterization and resolution considerations. Identified variances from the deterministic requirements of NFPA 805, Section 4.2.3. Documented variances as either a separation issue or a degraded fire protection system or feature. Developed VFDR problem statements to support resolution.

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

Step 5 - Final Disposition.

- Documented final disposition of the VFDRs in Attachment C (NEI 04-02 Table B-3).
- For recovery action compliance strategies, ensured the manual action feasibility analysis of the required recovery actions was completed. Note: if a recovery action cannot meet the feasibility requirements established per NEI 04-02, then alternate means of compliance was considered.
- Documented the post transition NFPA 805 Chapter 4 compliance basis.

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



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



## Results of the Evaluation Process

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

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

- Regulatory Basis - NFPA 805 post-transition regulatory bases are included.
- Performance Goal Summary - An overview of the method of accomplishment of each of the performance criteria in NFPA 805 Section 1.5 is provided.
- Reference Documents - Specific references to Nuclear Safety Capability Assessment Documents are provided.
- Licensing Actions - Specific references to exemption and deviation requests that will remain part of the post-transition licensing basis. A brief description of the condition and the basis for acceptability of the licensing action should be provided. Attachment T contains items for which BVPS-1 and BVPS-2 is requesting concurrence of prior approval.
- EEEE - Specific references to EEEE that rely on determinations of "adequate for the hazard" that will remain part of the post-transition licensing basis. A brief description of the condition and the basis for acceptability should be provided.
- VFDRs - Specific variances from the deterministic requirements of NFPA 805 Section 4.2.3. Refer to Section 4.5.2 for a discussion of the performance-based approach.

## 4.3 Non-Power Operational Modes

### 4.3.1 Overview of Evaluation Process

BVPS-1 and BVPS-2 implemented the process outlined in NEI 04-02 and FAQ 07-0040, "Clarification on Non-Power Operations." The goal (as depicted in Figure 4-5) is to ensure that contingency plans are established when the plant is in a NPO mode where the risk is intrinsically high. During low-risk periods, normal risk management controls and fire prevention/protection processes and procedures will be utilized.

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

- Reviewed the existing Outage Management Processes
- Identified equipment/cables:
  - Reviewed plant systems to determine success paths that support each of the defense-in-depth (DID) key safety functions (KSFs), and
  - Identified cables required for the selected components and determined their routing.
- Performed Fire Area Assessments (identify pinch points - plant locations where a single fire may damage all success paths of a KSF).
- Managed pinch-points associated with fire-induced vulnerabilities during the outage.

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

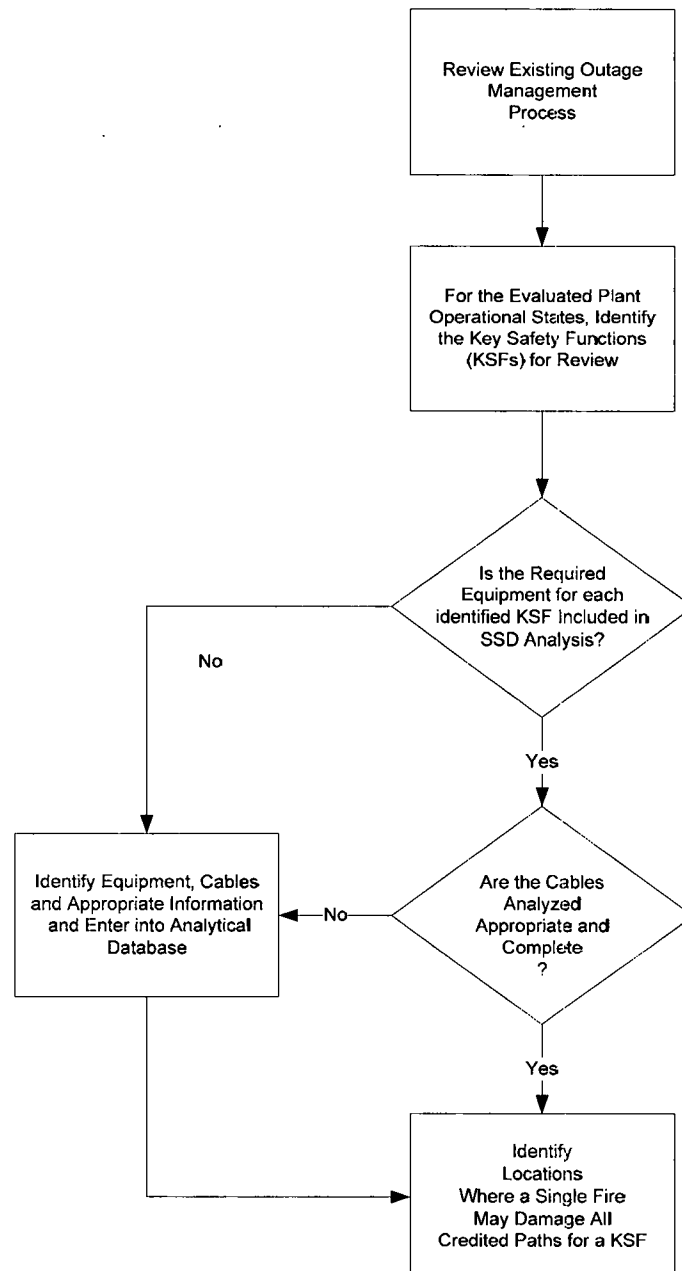


Figure 4-5 Review POSs, KSFs, Equipment, and Cables, and Identify Pinch Points

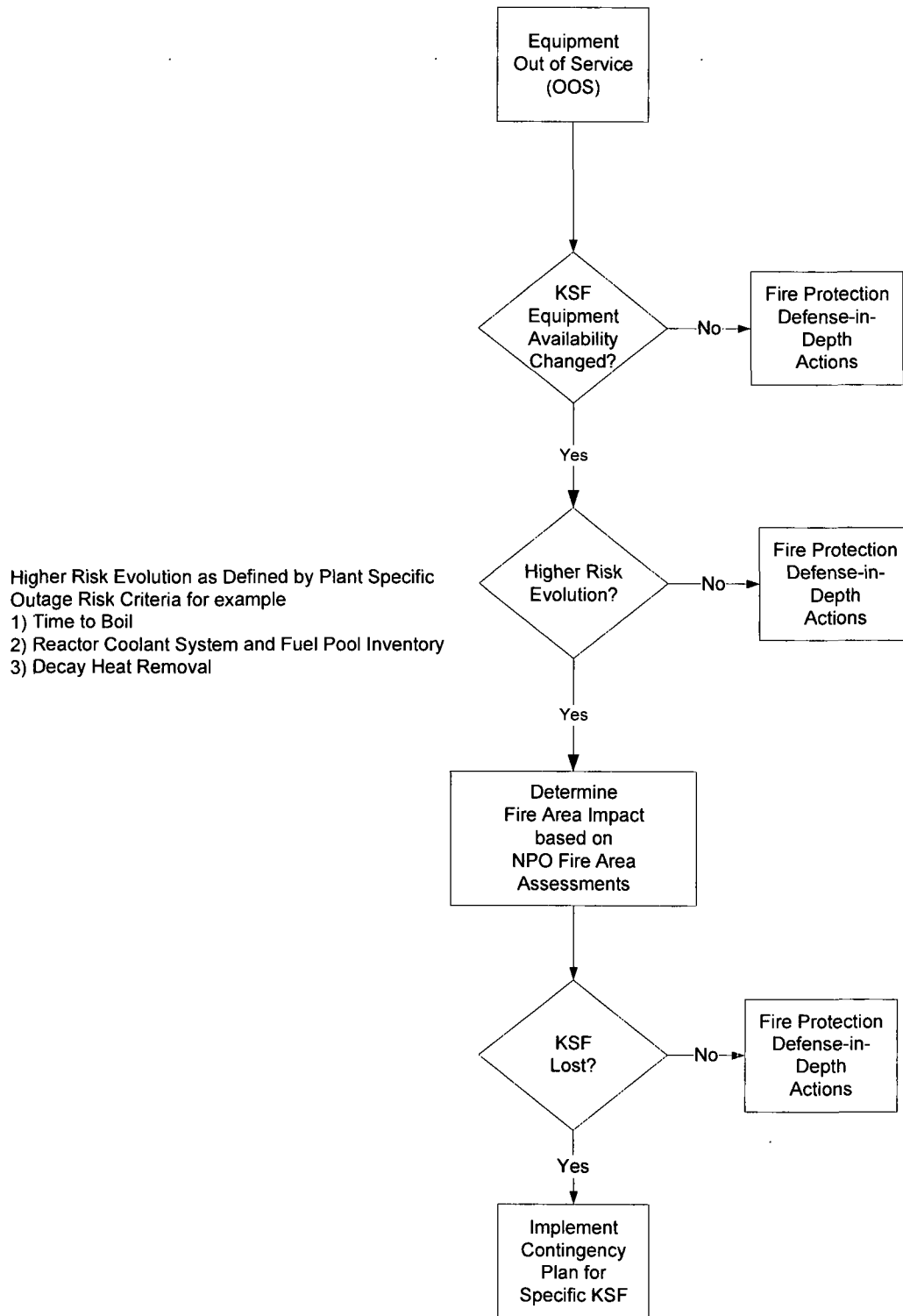


Figure 4-6 Manage Pinch Points

### 4.3.2 Results of the Evaluation Process

Based on FAQ 07-0040 (Revision 4), "Clarification on Non-Power Operations," the Plant Operating States (POS) considered for equipment and cable selection are defined in reports 8700-01.062-0084 and 2701.620-000-101, both titled "Non-Power Operational Modes Transition Report." Components were identified to support the KSFs of Inventory Control, Decay Heat Removal Capability, Reactivity Control, Containment Closure, and associated support functions (process cooling and electrical power). A model was developed in the NFPA 805 Analysis Database (Genesis Solution Suite, SAFE Module). Equipment was logically tied to the supported KSF. Power supplies, interlocks, and supporting equipment were logically tied to their parent component.

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

Reports 8700-01.062-0084 and 2701.620-000-101 also contain the fire area assessment, the identified pinch points, and general recommendations for administrative controls to reduce that fire risk as well as a proposed strategy for recovering the KSF should a fire occur. In accordance with FAQ 07-0040, any compartment experiencing fire damage which eliminates all success paths for a KSF (without recovery actions outside the main control room) is considered a pinch point. Fire modeling was not used to eliminate any fire compartment from being a pinch point.

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

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

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

## 4.4 Radioactive Release Performance Criteria

### 4.4.1 Overview of Evaluation Process

The review of the BVPS-1 and BVPS-2 fire protection program against NFPA 805 requirements for fire suppression related radioactive release was performed using the methodology contained in project instruction 2601.620-000-004, "ARS-PI-0009, Task 4.0 - Radiological Release Transition Review During Fire Suppression Activities." The methodology consisted of the following:

- A review of pre-fire plans to identify the locations that have the potential for radiological contamination and the fire protection program elements (e.g., systems/components/procedural control actions/flow paths, etc.) that are being credited to meet the radioactive release goals, objectives, and performance criteria during all plant operating modes, including full power and non-power conditions. The review ensured specific guidance was included in the pre-fire plans for containment and monitoring of potentially contaminated materials.
- A review of fire brigade training materials to ensure specific steps were included for dealing with containment and monitoring of potentially contaminated materials and monitoring of potentially contaminated fire suppression products following a fire event.
- A review of engineering controls to ensure containment of gaseous and liquid effluents (e.g., smoke and fire fighting agents). This review included all plant operating modes (including full power and non-power conditions).

### 4.4.2 Results of the Evaluation Process

The detailed radioactive release review records completed for the applicable BVPS-1 and BVPS-2 fire compartments are documented and contained in Attachment E. The radiological release review determined that radiation release to any unrestricted area due to the direct effects of fire suppression activities (but not involving fuel damage) would be as low as reasonable achievable and would not exceed applicable 10 CFR 20 limits.

#### **Pre-fire Plans:**

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

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

**Plant Operating Modes - Applicability:**

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

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

**Training:**

The fire brigade training materials were reviewed to ensure they contain adequate guidance regarding containment and monitoring of potentially contaminated gaseous and liquid effluents. Containment and monitoring will be ensured through elements of the pre-fire plans, fire brigade training, and certain plan features (engineering controls) such as curbs and ventilation systems or actions provided to control smoke management or fire suppression water run-off. The fire brigade training lesson plans reviewed did not identify that the use of fire suppression water may create the potential for contaminated fire suppression water. Enhancements to the training materials are identified in Attachment S.

**Yard Area:**

To ensure the radiological release objective and performance criteria are met as required by NFPA 805, pre-fire plan guidance was developed for outside yard areas to address radiological storage and sea-land type containers. A pre-fire plan for the yard area (3-YARD-1) was developed which consists of the yard area around the BVPS-1 and BVPS-2 complex. Due to the potential for storage of sea-land type containers used during normal operation and/or refueling operations, guidance has been incorporated into this yard area pre-fire plan for containment and monitoring actions associated with firefighting operations. Enhancements to the pre-fire plans are identified in Attachment S.

**Engineering Controls:**

Existing engineering controls, such as use of forced air ventilation and the presence of damming (curbs) for fire suppression agent run-off were considered during review of pre-fire plans. Because radioactive release review considers impact from the fire suppression activities, consideration was provided where suppression activities could potentially adversely impact the engineering controls. The review determined that existing engineering controls are adequate to ensure that radioactive materials generated as a direct result of fire suppression activities is contained and monitored prior to release to unrestricted areas such that such release would not exceed applicable 10 CFR 20 limits.

Radiation Protection personnel supplement the responding fire brigade firefighting efforts. Current radiation protection procedures and practices adequately describe how to monitor

and control liquid and gaseous effluents from the site. Therefore, the existing gaseous and liquid release limits for the site will be adhered to.

**Documentation:**

The site specific review of the direct effects of fire suppression activities on radioactive release is summarized in Attachment E. Open Items identified in the review process will be incorporated into the indicated fire pre-plans and fire brigade training lesson plans as indicated in Attachment E.

The review determined the fire protection program will be compliant with the requirements of NFPA 805 and the guidance in NEI 04-02 and RG 1.205 upon completion of the implementation items identified in Attachment E, and as summarized below and identified in Attachment S.

**Follow-up Actions:**

Based on the screening criteria, the applicable pre-fire plans do not presently provide specific guidance for containment and monitoring of potentially contaminated fire suppression water and products of combustion. The fire brigade training materials will be updated to include instruction for the containment and monitoring of potentially contaminated fire suppression water and products of combustion.

These results will be maintained post-transition by the established plant configuration control processes, and the output from the Radioactive Release Review will be incorporated into the Fire Safety Analysis for each applicable fire compartment.

**4.5 Fire PRA and Performance-Based Approaches**

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

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

**4.5.1 Fire PRA Development and Assessment**

In accordance with the guidance in RG 1.205, Fire PRA (FPRA) models were developed for BVPS-1 and BVPS-2 in compliance with the requirements of Part 4 "Requirements for Fires at-Power PRA," of the ASME and ANS combined PRA Standard, ASME/ANS RA-Sa-2009, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Application," (hereafter referred to as the Fire PRA Standard). BVPS-1 and BVPS-2 each conducted a peer review by independent industry analysts in accordance with RG 1.200 prior to a risk-informed submittal. The resulting fire risk assessment models are used as the analytical tools to perform Fire Risk Evaluations during the transition process.

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

**4.5.1.1 Internal Events PRA**

The BVPS-1 and BVPS-2 internal events PRA models, PRA-BV1-AL-R05 (BV1REV5) and PRA BV2-AL-R05a (BV2REV5A) respectively, were the basis for the Fire PRA models. In 2007, the BVPS internal events PRA models (BV1REV4 and BV2REV4) underwent a self-

assessment, with the assistance of Westinghouse, against the Capability Category II requirements of ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," with ASME RA-Sa-2003 and ASME RA-Sb-2005 Addenda, in accordance with RG 1.200, Revision 1. In the same year the Revision 4 PRA models (BV1REV4 and BV2REV4) also underwent a focused scope peer review against the Capability Category II requirements of the HRA element of the ASME PRA Standard (RA-Sb-2005), conducted by Westinghouse.

Gaps and F&Os identified in the self-assessment and the focused scope HRA peer review were addressed in the BV1REV5 and BV2REV5 PRA models, and the internal flooding models were upgraded in accordance with Part 3 "Internal Flood" of the ASME PRA Standard (RA-SA-2009), in accordance with RG 1.200, Revision 2. In 2011 a focused scope peer review was performed against the Capability Category II requirements of Part 3 "Internal Flood" of the ASME PRA Standard (RA-Sa-2009), conducted by Westinghouse. The F&Os identified in this peer review were addressed in the current BVPS-1 and BVPS-2 models of record, PRA-BV1-AL-R05a (BV1REV5A) and PRA-BV2-AL-R05a (BV2REV5A) respectively.

The self-assessment gaps and peer review F&Os have been addressed and closed in the BVPS-1 and BVPS-2 Revision 5a PRA models. The PRA models are considered to be fundamentally compliant with RG 1.200, Revision 1, for the scope of this application and meet Capability Category II requirements of Part 2, "Internal Events" and Part 3, "Internal Flood" of the ASME PRA Standard (RA-Sb-2009). Documentation of BVPS-1 and BVPS-2 technical adequacy was previously submitted to the NRC for the License Amendment Request for Adoption of TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b" by FENOC letter dated October 18, 2013 (ML13295A006).

#### **4.5.1.2 Fire PRA**

Fire PRA models were developed for BVPS-1 and BVPS-2 using the guidance provided in NUREG/CR-6850/EPRI TR-1011989, EPRI TR-1016735, and draft NUREG-1921. Attachment H provides a listing of the approved FAQs that affect the overall license transition process for BVPS-1 and BVPS-2. The resulting fire risk assessment models are used as the analytical tools to perform Fire Risk Evaluations during the transition process and to develop estimates of the potential change in fire related risk associated with those changes. The supporting documents for the BVPS-1 and BVPS-2 Fire PRA have been developed, reviewed by a peer review team, and updated.

The Fire PRA was developed using the Internal Events PRA as a starting point, BV1REV5 for BVPS-1 and BV2REV5A for BVPS-2. As described above, the BV1REV5 model does not include resolutions to F&Os from the 2011 Internal Flood PRA Peer Review; however this does not affect development of the Fire PRA because floods and fires are modeled as separate initiating events and have no direct impact on each other. The final BVPS-1 Internal Flood PRA model will be incorporated into a future update of the BVPS-1 Fire PRA model. The Internal Events PRA was modified to capture the effects of fire, both as an initiator of an event and the subsequent potential failure modes for affected circuits or individual targets. The BVPS-1 and BVPS-2 Fire PRA models are documented in a series of reports, calculations, and PRA Notebooks associated with each NUREG/CR-6850 fire PRA task. The Fire PRA quality and results are discussed in the subsequent sections and in Attachments V and W, respectively.



## Fire Model Utilization in the Application

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

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

### 4.5.1.3 Results of Fire PRA Peer Review

The BVPS-1 Fire PRA model BV1REV5F and BVPS-2 Fire PRA model BV2REV5F were peer reviewed against the requirements of ASME/ANS RA-Sa-2009, Part 4. The PWR Owners Group (PWR OG) issued reports containing the results of the BVPS-1 Fire PRA Peer Reviews conducted in January 2009 (LTR-RAM-II-09-006) and in January 2011 (LTR-RAM-II-11-008, which also reviewed and closed out F&Os from the previous peer review). The PWR OG issued a similar report for BVPS-2 containing the results of the Fire PRA Peer Review conducted in February 2012 (LTR-RAM-II-12-015). The identification and resolution of the F&Os from the PWR OG Fire PRA Peer Reviews are summarized in Attachment V.

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

### 4.5.1.4 Risk Insights

Risk insights were documented as part of the development of the Fire PRA. The total plant fire CDF/LERF values were derived using the NUREG/CR-6850 methodology for fire PRA development and are useful in identifying the areas of the plant where fire risk is greatest. The fire scenarios that collectively represent 95% of the calculated fire risk and whose individual contribution is more than 1% of the fire risk are included in Attachment W. These criteria are consistent with the definition of "significant" from the combined ASME/ANS PRA Standard RA-Sa-2009 (for the terms *significant accident sequence* and *significant accident progression sequence*).

## 4.5.2 Performance-Based Approaches

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

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

### 4.5.2.1 Fire Modeling Approach

The fire modeling approach was not utilized for the transition.

### 4.5.2.2 Fire Risk Approach

#### Overview of Evaluation Process

The Fire Risk Evaluations were completed as part of the BVPS-1 and BVPS-2 NFPA 805 transition. These Fire Risk Evaluations were developed using the procedure ARS-PI-0013,

“Fire Risk Evaluations” (2601.620-000-020). This methodology is based upon the requirements of NFPA 805, industry guidance in NEI 04-02, and RG 1.205. These are summarized in Table 4-1.

**Table 4-1 Fire Risk Evaluation Guidance Summary Table**

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

During the transition to NFPA 805, variances from the deterministic approach in Section 4.2.3 of NFPA 805 were evaluated using fire risk evaluations (FREs) per Section 4.2.4.2 of NFPA 805. A fire risk evaluation was performed for each fire compartment containing variances from the deterministic requirements (VFDRs) of Section 4.2.3 of NFPA 805.

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

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

#### Step 1 - Preparation for the Fire Risk Evaluation.

- Definition of the Variances from the Deterministic Requirements. The definition of the VFDR includes a description of problem statement and the section of NFPA 805 that is not met, type of VFDR (e.g., separation issue or degraded fire protection system), and proposed evaluation per applicable NFPA 805 section.
- Preparatory Evaluation - Fire Risk Evaluation Team Review. Using the information obtained during the development of the NEI 04-02 Table B-3 and the Fire PRA, a team review of the VFDR was performed. Depending on the scope and complexity of the VFDR, the team may include the Safe Shutdown/NSCA Engineer, the Fire Protection Engineer, and the Fire PRA Engineer. The purpose and objective of this team review was to address the following:
  - Review of the Fire PRA modeling treatment of VFDR
  - Ensure discrepancies were captured and resolved

#### Step 2 - Performed the Fire Risk Evaluation

- The Evaluator coordinated as necessary with the Safe shutdown/NSCA Engineer, Fire Protection Engineer and Fire PRA Engineer to assess the VFDR using the Fire Risk Evaluation process to perform the following:

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

### Step 3 - Reviewed the Acceptance Criteria

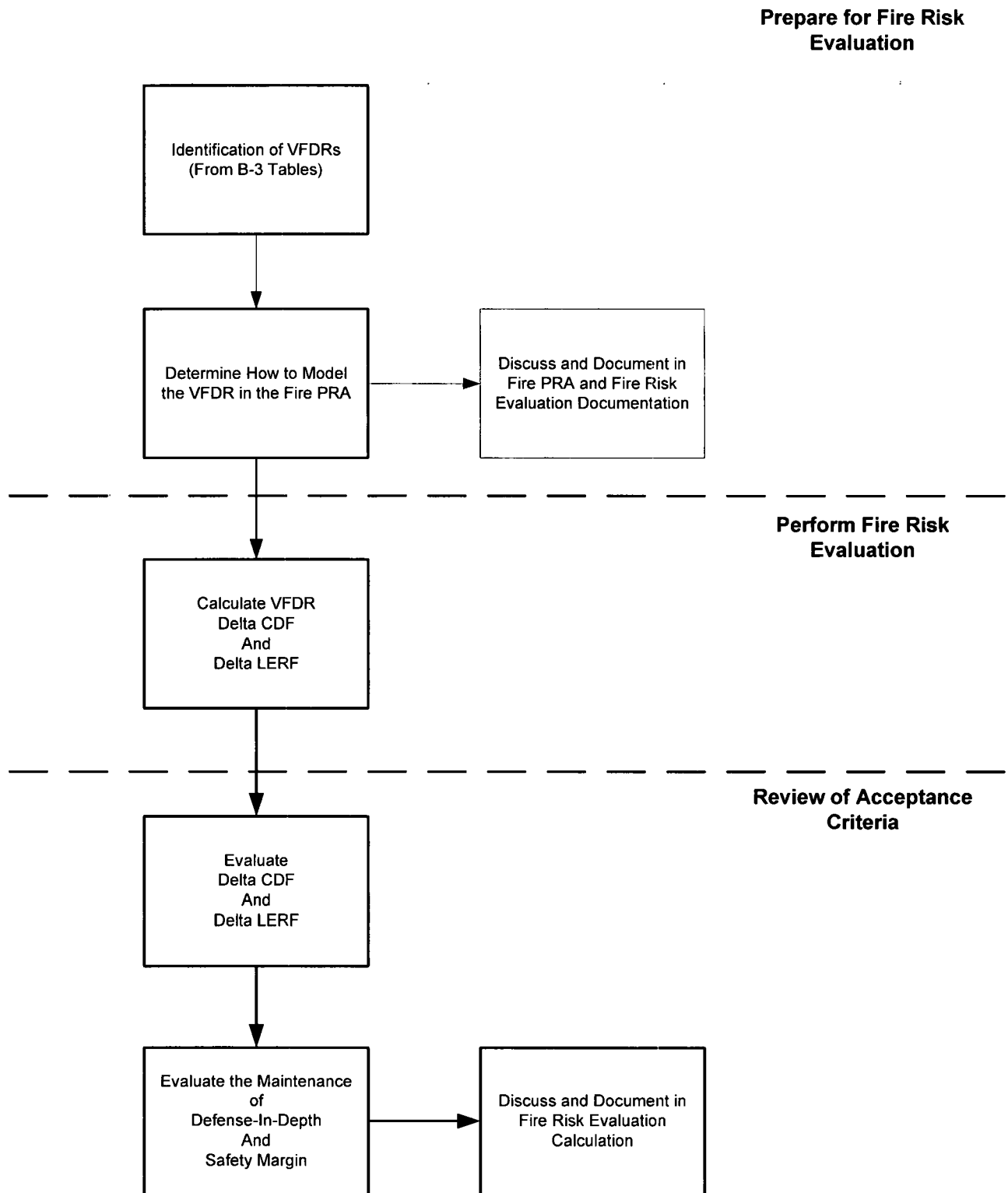
- The acceptance criteria for the fire risk evaluation consist of two parts. One is quantitatively based and the other is qualitatively based. The quantitative figures of merit are  $\Delta$ CDF (change in core damage frequency) and  $\Delta$ LERF (change in large early release frequency). The qualitative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

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

The review of defense-in-depth was qualitative and addressed each of the elements with respect to the proposed change. Defense-in-depth was performed on a fire compartment basis. Credited fire protection features and systems relied upon to ensure defense-in-depth were identified as a result of the assessment of defense-in-depth.

- Safety Margin Assessment. A review of the impact of the change on safety margin was performed. An acceptable set of guidelines for making that assessment is summarized below. Other equivalent acceptance guidelines may also be used.
  - Codes and standards or their alternatives accepted for use by the NRC are met, and
  - Safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) are met, or provide sufficient margin to account for analysis and data uncertainty.

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



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

## Results of Evaluation Process

### Disposition of VFDRs

The BVPS-1 and BVPS-2 existing post-fire NSCA and the NFPA 805 transition project activities have identified a number of variances from the deterministic requirements of NFPA 805 Section 4.2.3. These variances were dispositioned using the fire risk evaluation process.

Each variance dispositioned using a fire risk evaluation was assessed against the fire risk evaluation acceptance criteria of  $\Delta$ CDF and  $\Delta$ LERF; and maintenance of defense-in-depth and safety margin criteria from Section 5.3.5 of NEI 04-02 and RG 1.205. The results of these calculations are summarized in Attachment C.

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

### Risk Change Due to NFPA 805 Transition

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

RG 1.205 Section C.2.2.4.2 states in part:

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

The risk increases and decreases are provided in Attachment W.

## 4.6 Monitoring Program

### 4.6.1 Overview of NFPA 805 Requirements for the NFPA 805 Monitoring Program

Section 2.6 of NFPA 805 states:

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

As part of the transition review, the adequacy of the inspection and testing program to address fire protection systems and equipment within plant inspection and the compensatory measures programs should be reviewed. In addition, the adequacy of the plant corrective action program in determining the causes of equipment and programmatic

failures and minimizing their recurrence should also be reviewed as part of the transition to a risk-informed, performance-based licensing basis.

#### **4.6.2 Overview of Post-Transition NFPA 805 Monitoring Program**

This section describes the process that will be utilized to implement the post-transition NFPA 805 monitoring program. The Fire Protection Monitoring program will be described in procedure 1/2-ADM-1907, "Fire Protection Performance Based Surveillance Program Procedure," and will be revised/implemented after the safety evaluation issuance as part of the fire protection program transition to NFPA 805. The monitoring program described in this section is based on FAQ 10-0059, Revision 5, which was approved by the NRC in ML120750108. Beaver Valley will implement a monitoring program in accordance with the NRC-approved version of FAQ 10-0059 during implementation (see implementation item BV1-2989 in Attachment S). The monitoring process is comprised of four phases.

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

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

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

#### **Phase 1 - Scoping**

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

- SSCs required to comply with NFPA 805, specifically:
  - Fire protection systems and features
    - Required by the NSCA
    - Modeled in the Fire PRA
    - Required by Chapter 3 of NFPA 805
  - NSCA equipment<sup>4</sup>
    - Nuclear safety equipment
    - Fire PRA equipment
    - NPO equipment
  - SSCs relied upon to meet radioactive release criteria
- Fire Protection Programmatic Elements

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

As a minimum the fire protection systems, features, and SSCs required to meet the radioactive release criteria will be included in the existing inspection and test programs and in the system/program health program. The post NFPA 805 transition programs are adequate for routine monitoring of these SSCs. Plant specific initiatives will be undertaken to optimize fire protection surveillance and testing practices and frequencies based upon performance in accordance with the guidance in EPRI Technical Report (TR) 1006756, "Fire Protection Surveillance Optimization and Maintenance Guide for Fire Protection Systems and Features," referenced within NEI 04-02 Table B-1, LAR Attachment A.

## **Phase 2 – Screening Using Risk Criteria**

The equipment from Phase 1 scoping will be screened to determine the appropriate level of NFPA 805 monitoring. As a minimum, the SSCs identified in Phase 1 will be part of an inspection and test program and system/program health program. Phase 2 of the process uses the risk significance criteria and screens the SSCs and programmatic elements to determine high safety significant SSCs and programmatic elements. This will be accomplished at the component, programmatic element, and/or functional level. Since risk is evaluated at the analysis unit level (fire compartment, fire area, fire zone, or ignition source), criteria must be developed to determine those analysis units for which the SSCs are considered high safety significant. If not in the current program, the SSCs will be added in order to assure that the criteria can be met reliably.

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

### **1. Fire Protection Systems and Features**

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

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

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

Risk Achievement Worth (RAW) of the monitored parameter  $\geq 2.0$

(AND) either

Core Damage Frequency (CDF)  $\times$  (RAW)  $\geq 1.0\text{E-}7$  per year

(OR)

Large Early Release Frequency (LERF)  $\times$  (RAW)  $\geq 1.0\text{E-}8$  per year

CDF, LERF, and RAW<sub>(monitored parameter)</sub> are calculated for each fire area. The 'monitored parameter' will be established by licensee at a level commensurate with the amenability of the parameter to risk measurement (e.g., a fire barrier may be more conducive to risk measurement than an individual barrier penetration).

Fire protections systems and features that meet or exceed the criteria identified above are considered high safety significant (HSS) will be included in the monitoring program contained in the site Maintenance Rule Program described in NOP-ER-3004, "FENOC

Maintenance Rule Program.” The remaining required fire protection systems and features will be monitored via the existing inspection and test program and/or in the existing system/program health reporting as described in NOP-ER-2101, “Engineering Program Management” and 1/2-ADM-1907, “Fire Protection Performance Based Surveillance.”

Additionally, the review may include other analysis units (and required FP/NSCA SSCs and programmatic elements) that are not risk-significant (per the screening criteria) but are included based on plant specific history and/or operational considerations.

## **2. Nuclear Safety Capability Assessment Equipment\***

Required NSCA equipment, except the NPO scope, identified in Phase 1 will be screened for safety significance using the Fire PRA and the Maintenance Rule guidelines differentiating high safety significant equipment from low safety significant (LSS) equipment. The screening will also ensure that the Maintenance Rule functions are consistent with the required functions of the NSCA equipment.

High safety significant NSCA equipment not currently monitored in BVPS Maintenance Rule Program will be included in the program. All NSCA equipment that are not high safety significant are considered LSS and need not be included in the monitoring program.

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

## **3. SSCs Relied upon for Radioactive Release Criteria**

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

## **4. Monitoring of Fire Protection Programmatic Elements**

Monitoring of programmatic elements is required in order to “assess the performance of the fire protection program in meeting the performance criteria.” This monitoring is more qualitative in nature, since the programs do not lend themselves to the numerical methods of reliability and availability. These programs form the bases for many of the analytical assumptions used to evaluate compliance with NFPA 805 requirements. Programmatic aspects include:

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



Monitoring of programmatic elements is more qualitative in nature since the programs do not lend themselves to the numerical methods of reliability and availability. Therefore, monitoring is conducted using the existing system and program health programs. Fire protection health reports, self-assessments, regulator, and insurance company reports provide inputs to the monitoring program.

### **Phase 3 – Risk Target Value Determination**

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

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

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

When establishing the action level threshold for reliability and availability, the action level will be no lower than the fire PRA assumptions. Adverse trends and unacceptable levels of availability, reliability, and performance will be reviewed against established action levels. Documentation of the Monitoring Program failure criteria and action level targets will be contained in a documented evaluation.

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

### **Phase 4 – Monitoring Implementation**

Phase 4 is the implementation of the monitoring program, once the monitoring scope and criteria are established. Monitoring consists of periodically gathering, trending, and evaluating information pertinent to the performance, and/or availability of the equipment and comparing the results with the established goals and performance criteria to verify that the goals are being met. Results of monitoring activities will be analyzed in a timely manner to assure that appropriate action is taken. The corrective action process governed by NOP-LP-2001, "Corrective Action Program," will be used to address performance of fire protection and nuclear safety SSCs that do not meet performance criteria.

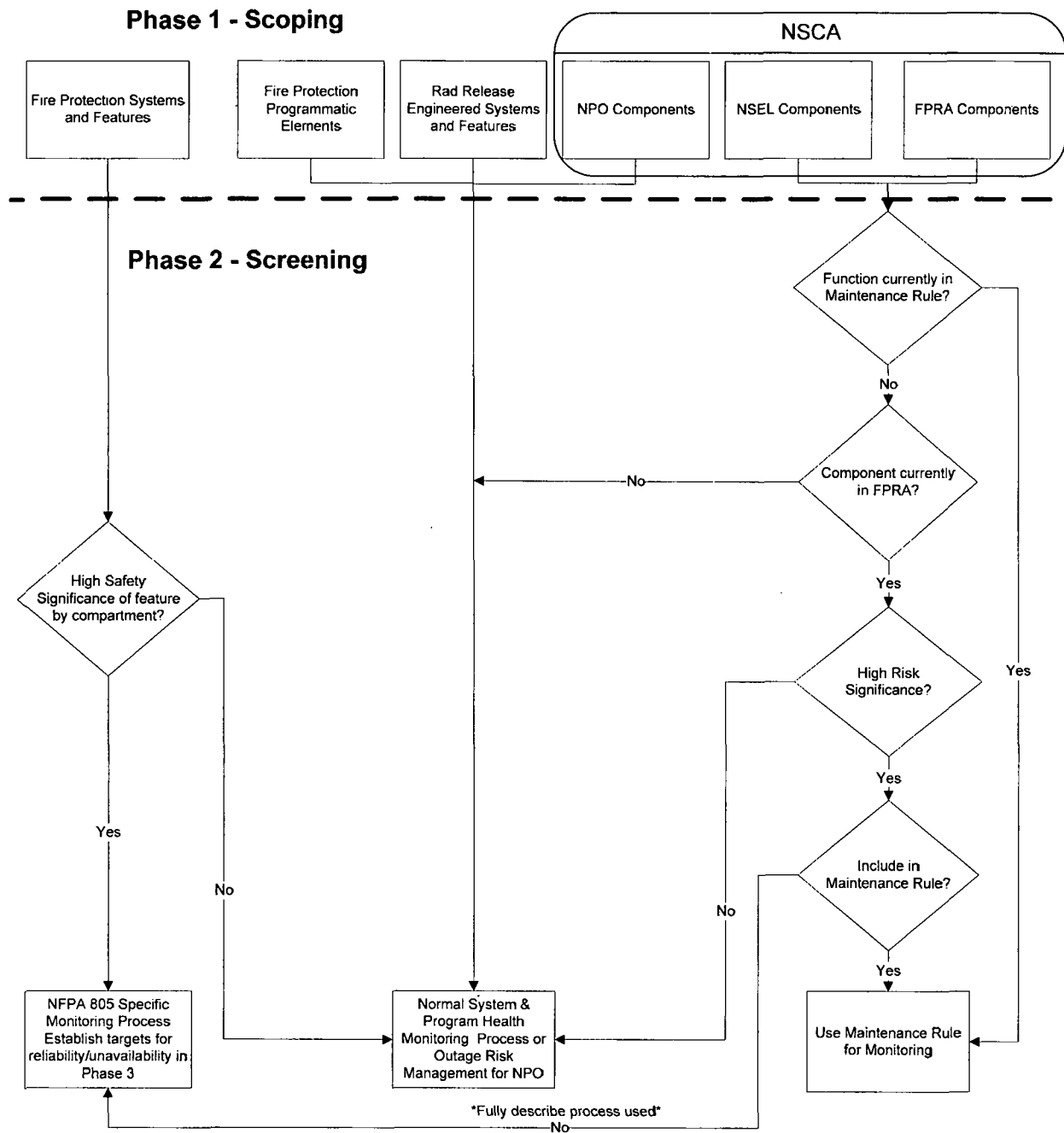
For fire protection systems and features and NSCA high safety significant fire protection that are monitored, unacceptable levels of availability, reliability, and performance will be reviewed against the established action levels, but will not be below the level assumed in the fire PRA assumptions. If an action level is triggered, corrective action in accordance with NOP-LP-2001, "Corrective Action Program," will be initiated to identify the negative

trend. A corrective action plan will then be developed to ensure performance returns to the established level.

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

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

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



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

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

## **4.7 Program Documentation, Configuration Control, and Quality Assurance**

### **4.7.1 Compliance with Documentation Requirements in Section 2.7.1 of NFPA 805**

In accordance with the requirements and guidance in NFPA 805 Section 2.7.1 and NEI 04-02, BVPS-1 and BVPS-2 have documented analyses to support compliance with 10 CFR 50.48(c). The analyses are being performed in accordance with FENOC's processes for ensuring assumptions are clearly defined, that results are easily understood, that results are clearly and consistently described, and that sufficient detail is provided to allow future review of the entire analyses.

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

The Fire Protection Design Basis Document described in Section 2.7.1.2 of NFPA 805 and necessary supporting documentation described in Section 2.7.1.3 of NFPA 805 have been created as part of the transition to 10 CFR 50.48(c) that will ensure program implementation following receipt of the SER. The design basis documentation is captured in fire protection calculations. Appropriate cross-references will be established to supporting documents as required by FENOC processes. Figure 4-9 depicts the planned post-transition documentation and relationships.

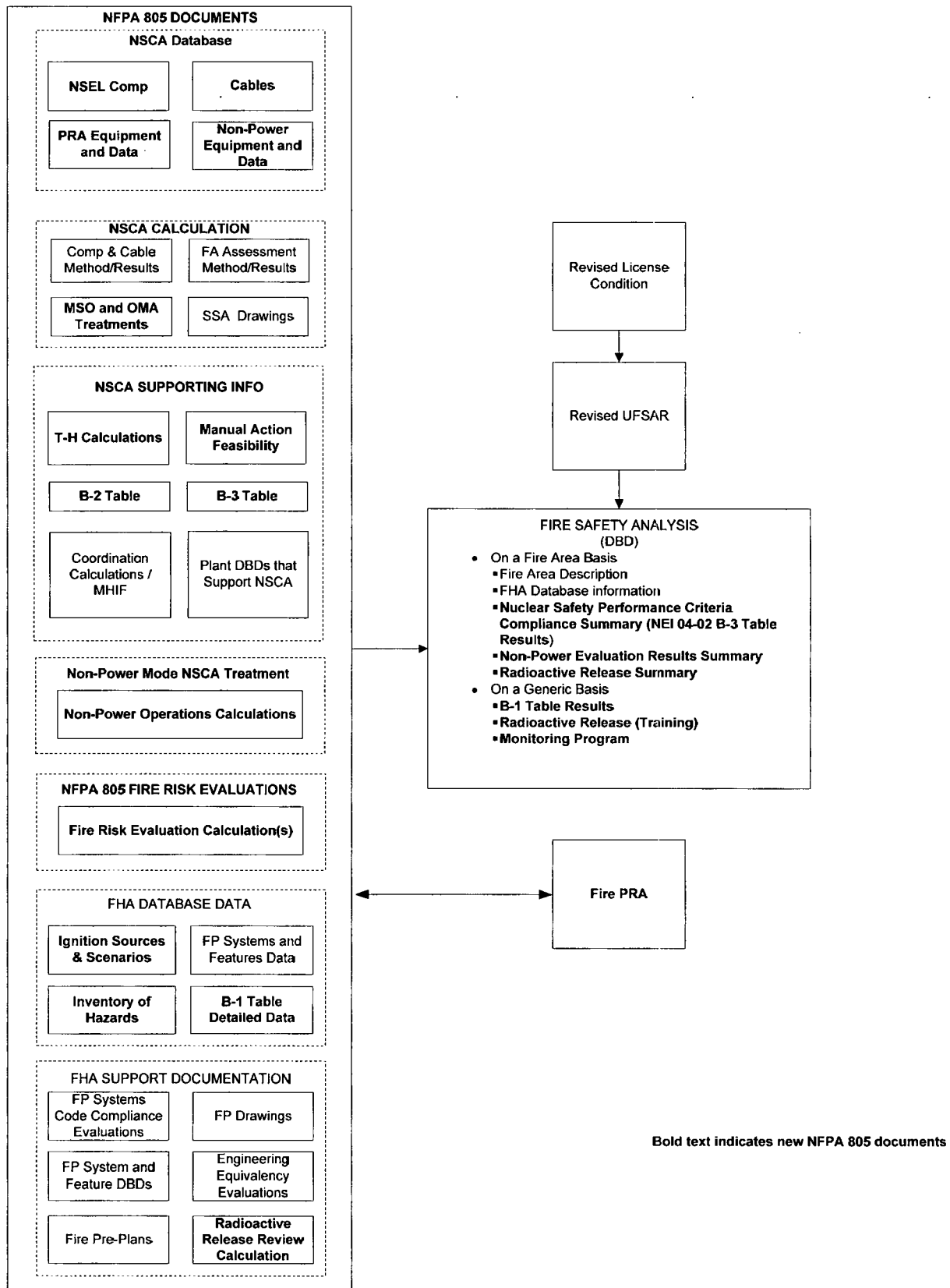


Figure 4-9 – NFPA 805 Planned Post-Transition Documents and Relationships

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

Program documentation established, revised, or utilized in support of compliance with 10 CFR 50.48(c) is subject to FENOC configuration control processes that meet the requirements of Section 2.7.2 of NFPA 805. This includes the appropriate procedures and configuration control processes for ensuring that changes impacting the fire protection program are reviewed appropriately. The RI-PB post-transition change process methodology is based upon the requirements of NFPA 805, and industry guidance in NEI 04-02, and RG 1.205. These requirements are summarized in Table 4-2.

Table 4-2 Change Evaluation Guidance Summary Table		
Document	Section(s)	Topic
NFPA 805	2.2(h), 2.2.9, 2.4.4, A.2.2(h), A.2.4.4, D.5	Change Evaluation
NEI 04-02	5.3, Appendix B, Appendix I, Appendix J	Change Evaluation, Change Evaluation Forms (Appendix I)
RG 1.205	C.2.2.4, C.3.1, C.3.2, C.4.3	Risk Evaluation, Standard License Condition, Change Evaluation Process, Fire PRA

The Plant Change Evaluation Process consists of the following 4 steps and is depicted in Figure 4-10:

- Defining the Change
- Performing the Preliminary Risk Screening
- Performing the Risk Evaluation
- Evaluating the Acceptance Criteria

#### Change Definition

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

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

#### Preliminary Risk Review

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

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

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

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

### **Risk Evaluation**

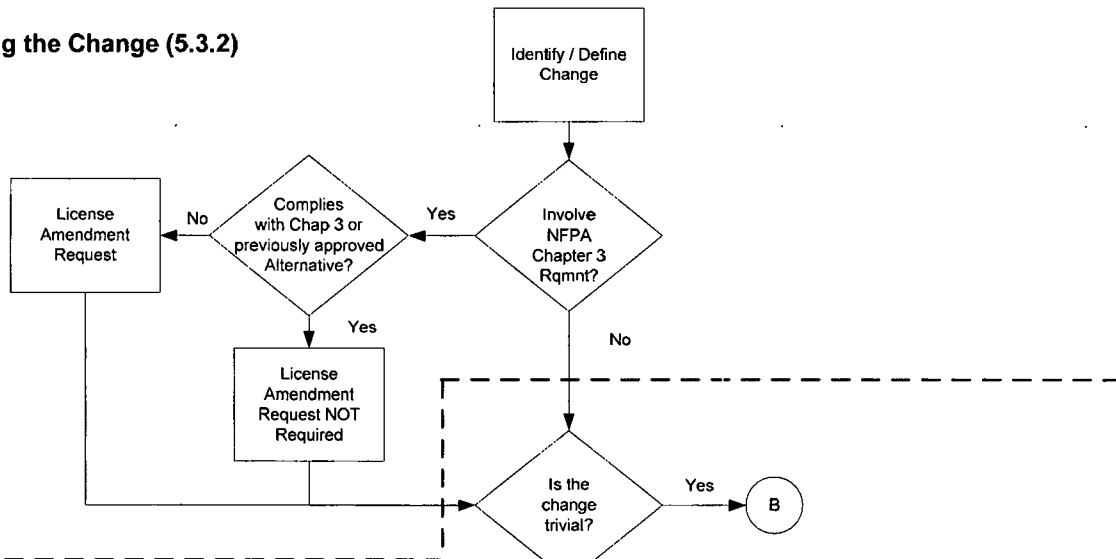
The screening is followed by engineering evaluations that may include fire modeling and risk assessment techniques. The results of these evaluations are then compared to the acceptance criteria. Changes that satisfy the acceptance criteria of NFPA 805, Section 2.4.4 and the license condition can be implemented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

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

### **Acceptability Determination**

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

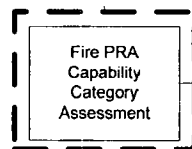
## Defining the Change (5.3.2)



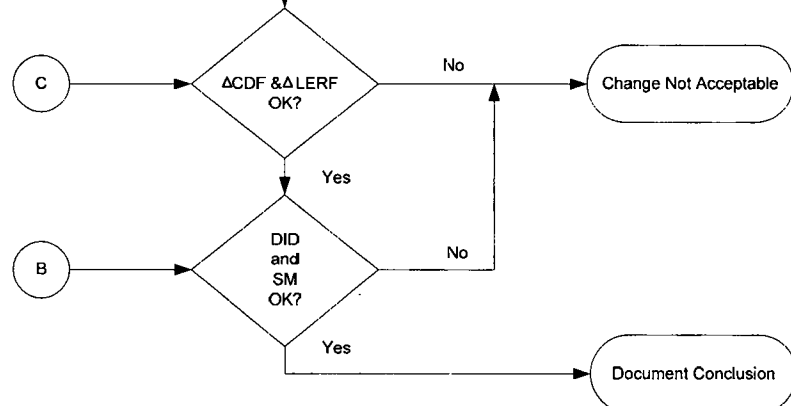
## Preliminary Risk Screening (5.3.3)

## Risk Evaluation (5.3.4)

## PRA Capability Category Assessment



## Acceptance Criteria (5.3.5)



**Figure 4-10 Plant Change Evaluation [NEI 04-02 Figure 5-1]**  
 Note references in Figure refer to NEI 04-02 Sections



The BVPS-1 and BVPS-2 Fire Protection Program configuration is defined by the program documentation. To the greatest extent possible, the existing configuration control processes for modifications, calculations and analyses, and Fire Protection Program License Basis Reviews will be utilized to maintain configuration control of the Fire Protection program documents. The configuration control procedures which govern the various BVPS-1 and BVPS-2 documents and databases that currently exist will be revised to reflect the new NFPA 805 licensing basis requirements.

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

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

- Deterministic Approach: Comply with NFPA 805 Chapter 3 and Section 4.2.3 requirements.
- Performance-Based Approach: Utilize the NFPA 805 change process developed in accordance with NEI 04-02, RG 1.205, and the BVPS-1 and BVPS-2 NFPA 805 fire protection license condition to assess the acceptability of the proposed change. This process would be used to determine if the proposed change could be implemented "as-is" or whether prior NRC approval of the proposed change is required.

This process follows the requirements in NFPA 805 and the guidance outlined in RG 1.174, Revision 1, which requires the use of qualified individuals, procedures that require calculations be subject to independent review and verification, record retention, peer review, and a corrective action program that ensures appropriate actions are taken when errors are discovered.

#### **4.7.3 Compliance with Quality Requirements in Section 2.7.3 of NFPA 805**

##### **Fire Protection Program Quality**

BVPS-1 and BVPS-2 will maintain the existing Fire Protection Quality Assurance program.

During the transition to 10 CFR 50.48(c), BVPS-1 and BVPS-2 performed work in accordance with the quality requirements of Section 2.7.3 of NFPA 805.

##### **Fire PRA Quality**

Configuration control of the Fire PRA model will be maintained by integrating the Fire PRA model into the existing processes used to ensure configuration control of the internal events

PRA model. This process complies with Section 5 of the ASME Standard for PRA Quality and ensures that FENOC maintain an as-built, as-operated PRA model of the plant. The process has been peer reviewed. Quality assurance of the Fire PRA is assured via the same processes applied to the internal events model.

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

With respect to QA Program requirements for independent reviews of calculations and evaluations, those existing requirements for Fire Protection Program documents will remain unchanged. FENOC specifically requires that the calculations and evaluations in support of the NFPA 805 LAR, exclusive of the Fire PRA, be performed within the scope of the QA program, which requires independent review as defined by BVPS-1 and BVPS-2 procedures. As recommended by NUREG/CR-6850, the sources of uncertainty in the Fire PRA were identified, and specific parameters were analyzed for sensitivity in support of the NFPA 805 Fire Risk Evaluation process.

Specifically, with regard to uncertainty, an uncertainty and sensitivity matrix was developed and included with 2601.620-000-012, BVPS-1 and BVPS-2 "Task Plan NUREG/CR-6850 Task 15, Uncertainty and Sensitivity Analysis." In addition, sensitivity to uncertainty associated with specific Fire PRA parameters was quantitatively addressed in 8700-01.062-0014, "BVPS-1 NFPA 805 Fire PRA Task 15 Uncertainty and Sensitivity Analysis" and in 2701.620-000-023, "BVPS-2 NFPA 805 Fire PRA Task 15 Uncertainty and Sensitivity Analysis."

While the removal of conservatism inherent in the Fire PRA is a long-term goal, the Fire PRA results were deemed sufficient for evaluating the risk associated with this application. While BVPS-1 and BVPS-2 continue to strive toward a more "realistic" estimate of fire risk, use of mean values continues to be the best estimate of fire risk. During the Fire Risk Evaluation process, the uncertainty and sensitivity associated with specific Fire PRA parameters were considerations in the evaluation of the change in risk relative to the applicable acceptance thresholds.

### **Specific Requirements of NFPA 805 Section 2.7.3:**

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

#### **NFPA 805 Section 2.7.3.1 – Review**

Analyses, calculations, and evaluations performed in support of compliance with 10 CFR 50.48(c) are performed in accordance with BVPS-1 and BVPS-2 procedures that require independent review.

**NFPA 805 Section 2.7.3.2 – Verification and Validation**

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

**NFPA 805 Section 2.7.3.3 – Limitations of Use**

Engineering methods and numerical models used in support of compliance with 10 CFR 50.48(c) are used and were used appropriately as required by Section 2.7.3.3 of NFPA 805.

**NFPA 805 Section 2.7.3.4 – Qualification of Users**

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

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

Post-transition, for personnel performing fire modeling or Fire PRA development and evaluation, BVPS-1 and BVPS-2 develop and maintain qualification requirements for individuals assigned various tasks. Position Specific Guides were developed to identify and document required training and mentoring to ensure individuals are appropriately qualified per the requirements of NFPA 805 Section 2.7.3.4 to perform assigned work.

**NFPA 805 Section 2.7.3.5 – Uncertainty Analysis**

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

**4.8 Summary of Results****4.8.1 Results of the Fire Area Review**

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

- Fire Compartment: BVPS-1/BVPS-2 Fire Compartment Identifier
- Description: BVPS-1/BVPS-2 Fire Compartment Description
- NFPA 805 Regulatory Basis: Post-transition NFPA 805 Chapter 4 compliance basis
- Auto Detection/Auto Suppression/Electrical Raceway Fire Barrier Systems (ERFBS)/Other Required Features/Required Fire Protection Feature and System Details: Features required in the Fire Compartment based on NFPA 805 Chapter 4 compliance. Other Required Features may include cable tray covers, combustible exclusion zones, radiant heat shields, etc. The documentation of required fire protection systems and features does not include the documentation of the fire compartment boundaries. Fire compartment boundaries are required and

documentation of the fire compartment boundaries has been performed as part of reviews of engineering evaluations, licensing actions, or as part of the reviews of the NEI 04-02 Table B-1 process. The basis for the requirement of the fire protection system /feature is designated as follows:

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

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

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

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

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

Table S-1 summarizes plant modifications associated with the transition to NFPA 805 that have already been implemented. Table S-2 summarizes plant modifications that are committed for implementation. Table S-3 provides a list of those items (procedure changes, process updates, and training of affected plant personnel) that will be completed prior to the implementation of the new NFPA 805 FP program at Beaver Valley.

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

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

BVPS-1 Fire Compartment	BVPS-1 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
1-CO-2	CO2 Storage & PG Water Pump Room	4.2.4					
1-CR-2	Control Room HVAC Equipment Room (713'-6")	4.2.4	A,R,E,L			R <sup>1</sup>	1. Cable Tray Covers
1-CR-3	Communication Equipt & Relay Room (713'-6")	4.2.4	A,R,E,L			R <sup>1</sup>	1. Cable Tray Covers
1-CR-4	Process Instrumentation Room (713'-6")	4.2.4	A,R <sup>1</sup> ,E,L	A,R <sup>4</sup> ,E		R <sup>3</sup> ,D <sup>2</sup>	1. Existing and Modification for incipient detection 2. Transient combustible exclusion zone 3. Cable tray covers 4. Partial Area [under floor]
1-CS-1	Cable Spreading Area (725'-6")	4.2.4	A,R,E,L	A,R,E,L		R <sup>1,3</sup> ,D <sup>1</sup> ,E <sup>2</sup>	1. Transient combustible exclusion zone 2. Ductline 997 is made of concrete with additional Marinite board where the concrete had reduced thickness. 3. Cable tray covers
1-CTP-1	Cooling Tower Pump House and Cooling tower	4.2.4					
1-CV-1	West Cable Vault (735'-6")	4.2.4	A,R,E	A,R,E		R <sup>2</sup> ,D <sup>1</sup>	1. Transient combustible exclusion zone 2. Cable tray covers
1-CV-2	East Cable Vault (735'-6")	4.2.4	A,R,E	A,R,E		R <sup>2</sup> ,D <sup>1</sup>	1. Transient combustible exclusion zone 2. Cable tray covers
1-CV-3	Cable Tunnel (720'-0")	4.2.4	A,R,L,E	A,R <sup>2</sup> ,L <sup>2</sup> ,E <sup>2</sup>		R <sup>1</sup> ,L <sup>3</sup> ,E <sup>3</sup>	1. Cable tray covers 2. Credit only for manual activation of Halon 3. Electrical Raceway and Cable covering
1-DG-1	Diesel Generator Room Train A	4.2.4	A,R,E	A,R,E			

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

BVPS-1 Fire Compartment	BVPS-1 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
1-DG-2	Diesel Generator Room Train B	4.2.4	A,R,E	A,R,E			
1-ES-1	Emergency Switchgear Room Train A	4.2.4	A,R,E,L			R <sup>1</sup>	1. Cable tray covers
1-ES-2	Emergency Switchgear Room Train B	4.2.4	A,R,E,L			R <sup>1</sup>	1. Cable tray covers
1-FB-1	Fuel Handling/Decon Buildings	4.2.4	A				
1-H-1	Bulk Hydrogen Storage Tanks in BVPS-1 Yard Area	4.2.4					
1-MG-1	Motor Generator Room (713'-6")	4.2.4	A,R,E,L				
1-MS-1	Main Steam Valve Room	4.2.4					
1-NS-1	Normal Switchgear Room	4.2.4	A,R,E			R <sup>1</sup>	1. Cable tray covers
1-PA-1A	Primary Auxiliary Building (768'-7")	4.2.4	A	A,E <sup>1</sup>			1. Partial Area
1-PA-1C	Primary Auxiliary Building (752'-6")	4.2.4	A	A			
1-PA-1E	Primary Auxiliary Building (735'-6")	4.2.4	A,R <sup>1</sup>	A,R <sup>1</sup> ,E	R	R <sup>2</sup>	1. Credit for only partial area detection and suppression 2. Cable tray covers
1-PA-1G	Primary Auxiliary Building (722'-6")	4.2.4			R		
1-PA-1GA	Charging Pump Cubicle 1A	4.2.4	A				
1-PA-1GB	Charging Pump Cubicle 1B	4.2.4	A				
1-PA-1GC	Charging Pump Cubicle 1C	4.2.4	A				
1-PT-1	Pipe Tunnel General Area	4.2.4					
1-QP-1	Quench Spray/AFW Pump Room	4.2.4	A,R <sup>1</sup> ,E <sup>1</sup>	A,R <sup>1</sup> ,E <sup>1</sup>			1. Suppression and detection coverage in AFW room only

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

BVPS-1 Fire Compartment	BVPS-1 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
1-RC-1	Reactor Containment Building	4.2.4	A,R <sup>2</sup> ,L <sup>2</sup>	A,R <sup>1</sup> ,L <sup>2</sup>			1. Detection at RHR pumps and containment wall electrical penetrations. Suppression at RHR pumps. 2. Suppression and Detection at RHR and containment wall electrical penetrations.
1-S-1	PAB West Stairwell and PAB Elevator Shaft	4.2.4					
1-S-2	Cable Vault East/West Stairwell	4.2.4					
1-S-3	PAB South Stairwell	4.2.4					
1-S-4	Control Room Stairwell	4.2.4					
1-S-5	Service Bldg Northwest Stairwell	4.2.4					
1-SB-GEN	Service Building (735'-6", 752'-6", 760'-0") and Pipe Chase (713'-6" to 760'-0")	4.2.4		A		E <sup>1</sup>	1. Protective coatings over the flex joints in the HVAC ductwork.
1-SGPD-1	Steam Generator Blowdown Area (752'-6")	4.2.4					
1-TB-1	Turbine Building	4.2.4		A,R <sup>2,4</sup>		R <sup>1,3</sup>	1. Turbine to Transformer Wall is considered a radiant heat shield 2. Area wet pipe only 3. Cable tray covers 4. Turbine Oil Reservoir Deluge
1-TO-1	Turbine Oil Storage Room	4.2.4		A			
1-TR-1	Unit 1 - Main Transformer (TR-MT1)	4.2.4		A		R <sup>1</sup>	1. Turbine Building wall credited as a radiant heat shield
1-TR-2	Unit 1 - Unit Station Service Transformer 1D	4.2.4		A		R <sup>1</sup>	1. Turbine Building wall credited as a radiant heat shield
1-TR-3	Unit 1 - Unit Station Service Transformer 1C	4.2.4		A		R <sup>1</sup>	1. Turbine Building wall credited as a radiant heat shield

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

BVPS-1 Fire Compartment	BVPS-1 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
1-TR-4	Unit 1 - System Station Service Transformer 1A	4.2.4		A		R <sup>1</sup>	1. Turbine Building wall credited as a radiant heat shield
1-TR-5	Unit 1 - System Station Service Transformer 1B	4.2.4		A		R <sup>1</sup>	1. Fire barrier separating 1-TR-5 and 1-WT-1 is credited as a radiant heat shield.
1-VP-1	River Water Valve Pit Train A	4.2.4					
1-VP-2	River Water Valve Pit Train B	4.2.4					
1-WH-1	Unit 1 Warehouse and Shop Area	4.2.4		A			
1-WT-1	Refueling Water Storage Tank Area (1QS-TK-1)	4.2.4				R <sup>1</sup>	1. Fire barrier separating 1-TR-5 and 1-WT-1 is credited as a radiant heat shield.
1-WT-10	Prim Plant Demin Water Storage Tank (1WT-TK-10)	4.2.4					
1-WT-11	Turbine Plant Demin Water Storage Tank (1WT-TK-11)	4.2.4					
1-WT-26	Auxiliary Demin Water Storage Tank (1WT-TK-26)	4.2.4					
3-AIS-1 *(Note 2)	Alternate Intake Structure	4.2.4					
3-CR-1 *(Note 2)	Main Control Room Units 1 & 2 for BVPS-1	4.2.4	A			R <sup>2</sup> , D <sup>1</sup>	1. Transient combustible limitation 2. Barriers between benchboard are credited
3-ER-1	ERF Substation	4.2.4	A	A			
3-ER-2	ERF Diesel Generator Building	4.2.4	A	A			
3-ER-3	Emergency Response Facility	4.2.4	A	A			
3-IS-1 *(Note 2)	Intake Structure Cubicle 1	4.2.4	A,L,E				
3-IS-2 *(Note 2)	Intake Structure Cubicle 2	4.2.4	A,L,E				



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

BVPS-1 Fire Compartment	BVPS-1 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
3-IS-3 *(Note 2)	Intake Structure Cubicle 3	4.2.4	A,L,E				
3-IS-4 *(Note 2)	Intake Structure Cubicle 4	4.2.4	A,L				
3-IS-6 *(Note 2)	Intake Structure (All areas except 3-IS-1, 2, 3, 4)	4.2.4					
3-TR-6	ERF Offsite Power Transformer (TRF-ERFS-3B)	4.2.4		A			
3-TR-7	ERF Offsite Power Transformer (TRF-ERFS-3A)	4.2.4		A			
3-YARD-1 *(Note 2)	Manholes and Ductlines in the Yard for BVPS-1	4.2.4				R <sup>1</sup>	1. Curbs associated with manholes

**Notes:**

- (not applicable)
- Main Control Room (3-CR-1), Yard Area (3-YARD-1), Intake Structure (3-IS-1 through 3-IS-6), and Alternate Intake Structure (3-AIS-1) are common to BVPS-1 and BVPS-2.
- The Switchyard and Relay House (located in the Switchyard) are excluded from the definition of the "Power Block" because they are not required to meet either the nuclear safety performance criteria or the radioactive release performance criteria as described in NFPA 805, Section 1.5.

**General Notes:**

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

**Abbreviations:**

- E - EEEE: Installed features or elements credited in "adequate for the hazard" or "equivalent" Existing Engineering Equivalency Evaluations
- L - Installed and Credited in approved NRC Licensing Exemptions or prior NRC Licensing Approval (i.e. Exemptions/Deviations)
- R - Risk Criteria: Systems that are installed and required to meet the Risk Criteria for the Performance-Based Approach
- D - Defense-in-depth Criteria: Systems that are installed and required to maintain adequate balance of Defense-in-Depth for a Performance-Based Approach
- S - Separation Criteria: Systems that are installed and required for Chapter 4 Separation Criteria
- A - Feature located in the area but no credit taken for it in risk reduction

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

BVPS-2 Fire Compartment	BVPS-2 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
2-ASP	Alternate Shutdown Panel Room	4.2.4	A,R,L				
2-CB-1	CB-1 (Instrument & Relay Room (707'-6")), CB-2 (Cable Spreading Room (725'-6")) and CT-1 (Cable Tunnel (712'-6"))/Fan Room in Aux. Bldg. (773'-6"))	4.2.4	A,R <sup>3</sup> ,E,L	A,R,L,E	R,E	R <sup>2</sup> ,D <sup>1</sup> ,L <sup>4</sup> ,E	1. Transient combustible exclusion zone 2. Cable Tray Covers 3. Existing and modification for incipient detection 4. Wrap on exposed ductwork
2-CB-4	Control Building Computer Room (735'-6")	4.2.4	A	A			
2-CB-5	Control Building Fan Room (735'-6")	4.2.4	A			L <sup>1</sup> ,E <sup>2</sup>	1. Wrap on exposed ductwork 2. Wrap on cable trays, conduit, and cable
2-CB-6	West Communication Room (707'-6")	4.2.4	A,R <sup>2</sup> ,L	A		R <sup>1</sup> ,L <sup>3</sup>	1. Cable Tray Covers 2. Existing and modification for incipient detection 3. Wrap on exposed ductwork
2-CP-1	Condensate Polishing Building	4.2.4	A	A		L <sup>1</sup> ,E <sup>2</sup>	1. Wrap on exposed ductwork 2. Wrap on cable trays, conduit, and cable
2-CTP-1	Cooling Tower Pump House and Cooling Tower	4.2.4					
2-CV-1	West Cable Vault & Rod Control Area (735'-6")	4.2.4	A,R,L,E	A,R,L,E	R,E	R <sup>2</sup> ,D <sup>1</sup> ,L <sup>3</sup> ,E <sup>4</sup>	1. Transient combustible exclusion zone 2. Cable Tray Covers 3. Wrap on exposed ductwork 4. Wrap on cable trays, conduit, and cable

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

BVPS-2 Fire Compartment	BVPS-2 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
2-CV-2	East Cable Vault & Rod Control Area (735'-6")	4.2.4	A,R,L,E	A,R,L,E		R <sup>2</sup> ,D <sup>1</sup> ,L <sup>3</sup> ,E <sup>4</sup>	1. Transient combustible exclusion zone 2. Cable Tray Covers 3. Wrap on exposed ductwork 4. Wrap on cable trays, conduit, and cable
2-CV-3	Cable Vault & Rod Control Area (755'-6")	4.2.4	A,R,L,E	A,R,L,E	R,E	R <sup>1</sup> ,L <sup>2</sup> ,E <sup>3</sup>	1. Cable Tray Covers 2. Wrap on exposed ductwork 3. Wrap on cable trays, conduit, and cable
2-CV-4	South Cable Vault & Rod Control Area (773'-6")	4.2.4	A			L <sup>1</sup>	1. Wrap on exposed ductwork
2-CV-5	North Cable Vault & Rod Control Area (773'-6")	4.2.4	A			L <sup>1</sup>	1. Wrap on exposed ductwork
2-CV-6	Cable Vault & Rod Control Relay Room (755'-6")	4.2.4	A,R,E,L	A,R,E,L		L <sup>1</sup>	1. Wrap on exposed ductwork
2-DG-1	Diesel Generator Cubicle Train A	4.2.4	A	A,R <sup>1</sup> ,L			1. CO2 in lower D/G cubicle only
2-DG-2	Diesel Generator Cubicle Train B	4.2.4	A	A,R <sup>1</sup> ,L			1. CO2 in lower D/G cubicle only
2-FB-1	Fuel Handling & Decontamination Building	4.2.4	A			L <sup>1</sup>	1. Wrap on exposed ductwork
2-H-1	Bulk Hydrogen Storage Tanks in BVPS-2 Yard Area	4.2.4					
2-MS-1	Main Steam Valve Room	4.2.4	A				

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

BVPS-2 Fire Compartment	BVPS-2 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
2-PA-3	Auxiliary Bldg. General Area (710'-6", 718'-6", 735'-6")	4.2.4	A,R <sup>1</sup> ,L <sup>1</sup> ,E <sup>1</sup>	A,R <sup>1</sup> ,L <sup>1</sup> ,E <sup>1</sup>	R,E	L <sup>2</sup> ,E <sup>3</sup>	1. Partial detection and partial water suppression systems 2. Wrap on exposed ductwork 3. Wrap on cable trays, conduit, and cable
2-PA-3A	Charging Pump Cubicle A (735'-6")	4.2.4	A			L <sup>1</sup>	1. Licensing action for separation
2-PA-3B	Charging Pump Cubicle B (735'-6")	4.2.4	A			L <sup>1</sup>	1. Licensing action for separation
2-PA-3C	Charging Pump Cubicle C (735'-6")	4.2.4	A			L <sup>1</sup>	1. Licensing action for separation
2-PA-4	Auxiliary Building General Area (755'-6")	4.2.4	A,R,L,E		R,E	L <sup>1</sup>	1. Wrap on exposed ductwork
2-PA-5	Auxiliary Building General Area (773'-6")	4.2.4	A,L			L <sup>1</sup> ,E <sup>2</sup>	1. Wrap on exposed ductwork 2. Wrap on cable trays, conduit, and cable
2-PA-6	Auxiliary Building MCC Room Train A (755'-6")	4.2.4	A				
2-PA-7	Auxiliary Building MCC Room Train B (755'-6")	4.2.4	A				
2-PT-1	Pipe Tunnel Area	4.2.4	A,R <sup>3</sup> ,L <sup>3</sup> ,E <sup>3</sup>			L <sup>1</sup> ,E <sup>2</sup>	1. Wrap on exposed ductwork 2. Wrap on cable trays, conduit, and cable 3. This area has partial fire detection

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

BVPS-2 Fire Compartment	BVPS-2 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
2-RC-1	Reactor Containment Building	4.2.4	A,R <sup>1</sup> ,L <sup>2</sup>	A,R <sup>1</sup> ,L <sup>2</sup>			1. Detection at RHR pumps and containment wall electrical penetrations. Suppression at RHR pumps. 2. Suppression and Detection at RHR and containment wall electrical penetrations.
2-S-1	Cable Vault Northwest Stairwell and Personnel Access Tunnel/Passageway	4.2.4	A				
2-S-4	Cable Vault West Stairwell	4.2.4	A				
2-SB-1	Service Bldg. Emergency Switchgear Train A (730'-6")	4.2.4	A,R,L,E			R <sup>1</sup> ,L <sup>2</sup> ,E <sup>3</sup>	1. Cable Tray Covers 2. Wrap on exposed ductwork 3. Wrap on cable trays, conduit, and cable
2-SB-10	Service Bldg. Non-Safety Related Battery Room 2-5 (760'-6")	4.2.4	A				
2-SB-2	Service Bldg. Emergency Switchgear Train B (730'-6")	4.2.4	A,R,L,E			R <sup>1</sup> ,L <sup>2</sup> ,E <sup>3</sup>	1. Cable Tray Covers 2. Wrap on exposed ductwork 3. Wrap on cable trays, conduit, and cable
2-SB-3	Service Building Cable Tray Area (745'-6")	4.2.4	A,R,L,E	A,R,L,E	R,E	D <sup>1</sup> ,L <sup>2</sup> ,E <sup>3</sup>	1. Transient combustible exclusion zone 2. Wrap on exposed ductwork 3. Wrap on cable trays, conduit, and cable

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

BVPS-2 Fire Compartment	BVPS-2 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
2-SB-4	Service Building Normal Switchgear Room (760'-6")	4.2.4	A,R,L,E		R,E	R <sup>2</sup> ,D <sup>1</sup> ,L <sup>3</sup> ,E <sup>4</sup>	1. Transient combustible exclusion zone 2. Cable Tray Covers 3. Wrap on exposed ductwork 4. Wrap on cable trays, conduit, and cable
2-SB-5	Service Building MFRV Room (780'-6")	4.2.4	A,L			L <sup>1</sup> ,E <sup>2</sup>	1. Wrap on exposed ductwork 2. Wrap on cable trays, conduit, and cable
2-SB-6	Service Building Battery Room 2-1 (730'-6")	4.2.4	A,L			L <sup>1</sup>	1. Wrap on exposed ductwork
2-SB-7	Service Building Battery Room 2-3 (730'-6")	4.2.4	A,L			L <sup>1</sup>	1. Wrap on exposed ductwork
2-SB-8	Service Building Battery Room 2-2 (730'-6")	4.2.4	A,L			L <sup>1</sup>	1. Wrap on exposed ductwork
2-SB-9	Service Building Battery Room 2-4 (730'-6")	4.2.4	A,L			L <sup>1</sup>	1. Wrap on exposed ductwork
2-SG-1N	North Safeguards Area	4.2.4	A,R <sup>1</sup> ,L,E	A,R <sup>1</sup>		L <sup>2</sup>	1. Partial area fire detection and suppression 2. Wrap on exposed ductwork
2-SG-1S	South Safeguards Area	4.2.4	A,R <sup>2</sup> ,L,E	A,R <sup>2</sup>		D <sup>1</sup> ,L <sup>3</sup> ,E <sup>4</sup>	1. Transient combustible exclusion zone 2. Partial area fire detection and Suppression 3. Wrap on exposed ductwork 4. Wrap on cable trays, conduit, and cable
2-TB-1	Turbine Building General Area	4.2.4		A,R <sup>1</sup> ,E		R <sup>2</sup>	1. Partial area wet pipe and Turbine oil reservoir deluge systems 2. Some Cable Tray Covers

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

BVPS-2 Fire Compartment	BVPS-2 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
2-TB-2	Turbine Building Battery Room 2-6	4.2.4	A				
2-TR-1	Unit 2 Main Transformer (TR-MT-2)	4.2.4		A		R <sup>1</sup>	1. Turbine Building wall is considered a radiant heat shield
2-TR-2	Unit 2 - Unit Station Service Transformer 2C	4.2.4		A		R <sup>1</sup>	1. Turbine Building wall is considered a radiant heat shield
2-TR-3	Unit 2 - Unit Station Service Transformer 2D	4.2.4		A		R <sup>1</sup>	1. Turbine Building wall is considered a radiant heat shield
2-TR-4	Unit 2 - System Station Service Transformer 2B	4.2.4		A			
2-TR-5	Unit 2 - System Station Service Transformer 2A	4.2.4		A			
2-VP-1	Service Water Valve Pit East Train A	4.2.4					
2-VP-2	Service Water Valve Pit West Train B	4.2.4					
2-WH-1	Unit 2 Waste Handling Building (All Levels)	4.2.4		A		L <sup>1</sup>	1. Wrap on exposed ductwork
2-WT-21	Refueling Water Storage Tank Area (2QSS-TK21)	4.2.4					
2-WT-210	Primary Plant Demineralized Water Storage Tank (2FWE-TK210)	4.2.4					
2-WT-211	Turbine Plant Demineralized Water Storage Tank (2WTD-TK211)	4.2.4					

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

BVPS-2 Fire Compartment	BVPS-2 Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Required Fire Protection Feature and System Details
2-WT-23	Demineralized Water Storage Tank (2WTD-TK23)	4.2.4					
3-CR-1 *(Note 2)	Main Control Room Units 1 & 2 for BVPS-2	4.2.4	A				

**Notes:**

1. (not applicable)
2. Main Control Room (3-CR-1), Yard Area (3-YARD-1), Intake Structure (3-IS-1 through 3-IS-6), and Alternate Intake Structure (3-AIS-1) are common to BVPS-1 and BVPS-2.

**General Notes:**

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

**Abbreviations:**

- E - EEEE: Installed features or elements credited in "adequate for the hazard" or "equivalent" Existing Engineering Equivalency Evaluations
- L - Installed and Credited in approved NRC Licensing Exemptions or prior NRC Licensing Approval (i.e. Exemptions/Deviations)
- R - Risk Criteria: Systems that are installed and required to meet the Risk Criteria for the Performance-Based Approach
- D - Defense-in-depth Criteria: Systems that are installed and required to maintain adequate balance of Defense-in-Depth for a Performance-Based Approach
- S - Separation Criteria: Systems that are installed and required for Chapter 4 Separation Criteria
- A - Feature located in the area but no credit taken for it in risk reduction



## 5.0 REGULATORY EVALUATION

### 5.1 Introduction – 10 CFR 50.48

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

The voluntary adoption of 10 CFR 50.48(c) by BVPS-1 and BVPS-2 does not eliminate the need to comply with 10 CFR 50.48(a) and 10 CFR 50, Appendix A, GDC 3, Fire Protection. The NRC addressed the overall adequacy of the regulations during the promulgation of 10 CFR 50.48(c) (Reference FR Notice 69 FR 33536 dated June 16, 2004, ML041340086).

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

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

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

the requirements in NFPA 805. All other requirements of 10 CFR 50.48(a) and GDC 3 have corresponding requirements in NFPA 805.

A comparison of the current requirements in Appendix R with the comparable requirements in Section 3 of NFPA 805 shows that the two sets of requirements are consistent in many respects. This was further clarified in FAQ 07 0032, 10 CFR 50.48(a) and GDC 3 clarification (ML081400292). The following tables provide a cross reference of fire protection regulations associated with the post-transition BVPS-1 and BVPS-2 fire protection programs and applicable industry and BVPS-1 and BVPS-2 documents that address the topic.

### 10 CFR 50.48(a)

Table 5-1 10 CFR 50.48(a) – Applicability/Compliance Reference	
10 CFR 50.48(a) Section(s)	Applicability/Compliance Reference
(1) Each holder of an operating license issued under this part or a combined license issued under part 52 of this chapter must have a fire protection plan that satisfies Criterion 3 of Appendix A to this part. This fire protection plan must:	See below
(i) Describe the overall fire protection program for the facility;	NFPA 805 Section 3.2 NEI 04-02 Table B-1
(ii) Identify the various positions within the licensee's organization that are responsible for the program;	NFPA 805 Section 3.2.2 NEI 04-02 Table B-1
(iii) State the authorities that are delegated to each of these positions to implement those responsibilities; and	NFPA 805 Section 3.2.2 NEI 04-02 Table B-1
(iv) Outline the plans for fire protection, fire detection and suppression capability, and limitation of fire damage.	NFPA 805 Section 2.7 and Chapters 3 and 4 NEI 04-02 B-1 and B-3 Tables
(2) The plan must also describe specific features necessary to implement the program described in paragraph (a)(1) of this section such as:	See below
(i) Administrative controls and personnel requirements for fire prevention and manual fire suppression activities;	NFPA 805 Sections 3.3.1 and 3.4 NEI 04-02 Table B-1
(ii) Automatic and manually operated fire detection and suppression systems; and	NFPA 805 Sections 3.5 through 3.10 and Chapter 4 NEI 04-02 B-1 and B-3 Tables
(iii) The means to limit fire damage to structures, systems, or components important to safety so that the capability to shut down the plant safely is ensured.	NFPA 805 Section 3.3 and Chapter 4 NEI 04-02 B-3 Table
(3) The licensee shall retain the fire protection plan, and each change to the plan as a record until the Commission terminates the reactor license. The licensee shall retain each superseded revision of the procedures for 3 years from the date it was superseded.	NFPA 805 Section 2.7.1.1 requires that documentation (Analyses, as defined by NFPA 805 2.4, performed to demonstrate compliance with this standard) be maintained for the life of the plant. 1/2-ADM-1900, "Fire Protection Program" and 1/2-ADM-1903, "Fire Protection Program Change Process" procedures provide directions for retention of records to the fire protection plan.

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

10 CFR 50.48(a) Section(s)	Applicability/Compliance Reference
(4) Each applicant for a design approval, design certification, or manufacturing license under part 52 of this chapter must have a description and analysis of the fire protection design features for the standard plant necessary to demonstrate compliance with Criterion 3 of Appendix A to this part.	Not applicable. BVPS-1 and BVPS-2 are licensed under 10 CFR 50.

**General Design Criterion 3****Table 5-2 GDC 3 – Applicability/Compliance Reference**

GDC 3, Fire Protection, Statement	Applicability/Compliance Reference
Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions.	NFPA 805 Chapters 3 and 4 NEI 04-02 B-1 and B-3 Tables
Non-combustible and heat-resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room.	NFPA 805 Sections 3.3.2, 3.3.3, 3.3.4, 3.11.4 NEI 04-02 B-1 Table
Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety.	NFPA 805 Chapters 3 and 4 NEI 04-02 B-1 and B-3 Tables
Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components	NFPA 805 Sections 3.4 through 3.10 and 4.2.1 NEI 04-02 Table B-3

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

10 CFR 50.48(c) Section(s)	Applicability/Compliance Reference
(1) <i>Approval of incorporation by reference.</i> National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition" (NFPA 805), which is referenced in this section, was approved for incorporation by reference by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR Part 51.	General Information. NFPA 805 (2001 Edition) is the edition used.
(2) Exceptions, modifications, and supplementation to NFPA 805. As used in this section, references to NFPA 805 are to the 2001 Edition, with the following exceptions, modifications, and supplementation:	General Information. NFPA 805 (2001 edition) is the edition used.
(i) <i>Life Safety Goal, Objectives, and Criteria.</i> The Life Safety Goal, Objectives, and Criteria of Chapter 1 are not endorsed.	The Life Safety Goal, Objectives, and Criteria of Chapter 1 of NFPA 805 are not part of the LAR.

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

10 CFR 50.48(c) Section(s)	Applicability/Compliance Reference
(ii) <i>Plant Damage/Business Interruption Goal, Objectives, and Criteria.</i> The Plant Damage/Business Interruption Goal, Objectives, and Criteria of Chapter 1 are not endorsed.	The Plant Damage/Business Interruption Goal, Objectives, and Criteria of Chapter 1 of NFPA 805 are not part of the LAR.
(iii) <i>Use of feed-and-bleed.</i> In demonstrating compliance with the performance criteria of Sections 1.5.1(b) and (c), a high-pressure charging/injection pump coupled with the pressurizer power-operated relief valves (PORVs) as the sole fire-protected safe shutdown path for maintaining reactor coolant inventory, pressure control, and decay heat removal capability (i.e., feed-and-bleed) for pressurized-water reactors (PWRs) is not permitted.	Feed and bleed is not utilized as the sole fire-protected safe shutdown methodology.
(iv) Uncertainty analysis. An uncertainty analysis performed in accordance with Section 2.7.3.5 is not required to support deterministic approach calculations.	Uncertainty analysis was not performed for deterministic methodology.
(v) Existing cables. In lieu of installing cables meeting flame propagation tests as required by Section 3.3.5.3, a flame-retardant coating may be applied to the electric cables, or an automatic fixed fire suppression system may be installed to provide an equivalent level of protection. In addition, the italicized exception to Section 3.3.5.3 is not endorsed.	Electrical cable construction complies with a flame propagation test that was found acceptable to the NRC as documented in NEI 04-02 Table B-1.
(vi) Water supply and distribution. The italicized exception to Section 3.6.4 is not endorsed. Licensees who wish to use the exception to Section 3.6.4 must submit a request for a license amendment in accordance with paragraph (c)(2)(vii) of this section.	BVPS-1 and BVPS-2 comply via previous approval. See NEI 04-02 Table B-1.
(vii) Performance-based methods. Notwithstanding the prohibition in Section 3.1 against the use of performance-based methods, the fire protection program elements and minimum design requirements of Chapter 3 may be subject to the performance-based methods permitted elsewhere in the standard. Licensees who wish to use performance-based methods for these fire protection program elements and minimum design requirements shall submit a request in the form of an application for license amendment under § 50.90. The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the performance-based approach; (A) Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release; (B) Maintains safety margins; and (C) Maintains fire protection defense in depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).	The use of performance-based methods for NFPA 805 Chapter 3 is requested. See Attachment L.
(3) <i>Compliance with NFPA 805.</i>	See below

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

10 CFR 50.48(c) Section(s)	Applicability/Compliance Reference
(i) A licensee may maintain a fire protection program that complies with NFPA 805 as an alternative to complying with paragraph (b) of this section for plants licensed to operate before January 1, 1979, or the fire protection license conditions for plants licensed to operate after January 1, 1979. The licensee shall submit a request to comply with NFPA 805 in the form of an application for license amendment under § 50.90. The application must identify any orders and license conditions that must be revised or superseded, and contain any necessary revisions to the plant's technical specifications and the bases thereof. The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the licensee has identified orders, license conditions, and the technical specifications that must be revised or superseded, and that any necessary revisions are adequate. Any approval by the Director or the designee must be in the form of a license amendment approving the use of NFPA 805 together with any necessary revisions to the technical specifications.	The LAR was submitted in accordance with 10 CFR 50.90. The LAR included applicable license conditions, orders, technical specifications/bases that needed to be revised and/or superseded.
(ii) The licensee shall complete its implementation of the methodology in Chapter 2 of NFPA 805 (including all required evaluations and analyses) and, upon completion, modify the fire protection plan required by paragraph (a) of this section to reflect the licensee's decision to comply with NFPA 805 before changing its fire protection program or nuclear power plant as permitted by NFPA 805.	The LAR and transition report summarize the evaluations and analyses performed in accordance with Chapter 2 of NFPA 805.
(4) Risk-informed or performance-based alternatives to compliance with NFPA 805. A licensee may submit a request to use risk-informed or performance-based alternatives to compliance with NFPA 805. The request must be in the form of an application for license amendment under § 50.90 of this chapter. The Director of the Office of Nuclear Reactor Regulation, or designee of the Director, may approve the application if the Director or designee determines that the proposed alternatives: (i) Satisfy the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release; (ii) Maintain safety margins; and (iii) Maintain fire protection defense in depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).	No risk-informed or performance-based alternatives to compliance with NFPA 805 (per 10 CFR 50.48(c)(4)) were utilized. See Attachment P.

## 5.2 Regulatory Topics

### 5.2.1 License Condition Changes

The current BVPS-1 fire protection license condition 2.C(5) and BVPS-2 fire protection license condition 2.F are being replaced with the standard license condition based upon Regulatory Position 3.1 of RG 1.205, as shown in Attachment M.

### 5.2.2 Technical Specifications

BVPS-1 and BVPS-2 conducted a review of the Technical Specifications to determine which Technical Specifications are required to be revised, deleted, or superseded. As stated in Attachment N, it was determined that no changes to the Technical Specifications are needed for the proposed BVPS-1 and BVPS-2 adoption of the new fire protection licensing basis.

### 5.2.3 Orders and Exemptions

A review was conducted of the BVPS-1 and BVPS-2 docketed correspondence to determine if there were any orders or exemptions that needed to be superseded or revised. A review was also performed to ensure that compliance with the physical protection requirements, security orders, and adherence to those commitments applicable to the plant are maintained. A discussion of affected orders and exemptions is included in Attachment O.

## 5.3 Regulatory Evaluations

### 5.3.1 No Significant Hazards Consideration

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

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

This evaluation is contained in Attachment Q.

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

### 5.3.2 Environmental Consideration

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

## 5.4 Revision to the UFSAR

After the approval of the LAR, in accordance with 10 CFR 50.71(e), the BVPS-1 and BVPS-2 UFSAR will be revised. The format and content will be consistent with FAQ 12-0062.

## 5.5 Transition Implementation Schedule

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

- Implementation of new NFPA 805 fire protection program to include procedure changes, process updates, and training to affected plant personnel. Implementation will occur 180 days after NRC approval. See Attachment S, Table S-3.

- Attachment S, Table S-1 and S-2, provides a listing of plant modifications associated with the transition to NFPA 805 and their implementation status (open or complete). Modifications will be completed by the startup of the second refueling outage (for each unit) after the issuance of the SER. Appropriate compensatory measures will be maintained until modifications are complete.

## 6.0 REFERENCES

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

### Federal Regulations and NRC Guidance:

- 1) 10 CFR Part 50.48, "Fire Protection."
- 2) "Fire Protection Program - Post-Fire Operator Manual Actions," March 6, 2006, Federal Register, Vol. 71, No. 43, pp. 11169-11172.
- 3) Generic Letter 2006-03, April 10, 2006, "Potentially Nonconforming Hemyc and MT Fire Barrier Configurations," (not applicable to BVPS-1).
- 4) NFPA 805, 2001 Edition, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants."
- 5) NRC letter to NEI (ML061660105), July 12, 2006, "Process for Frequently Asked Questions for Title 10 of the Code of Federal Regulations, Part 50.48(c) Transitions."
- 6) "NRC Enforcement Policy," June 16, 2004, Federal Register, Vol. 69, No. 115, pp. 33684-33685.
- 7) "NRC Enforcement Policy: Extension of Discretion Period of Interim Enforcement Policy," April 18, 2006, Federal Register, Vol. 71, No. 74, pp. 19905-19907.
- 8) "NRC Enforcement Policy; Extension of Enforcement Discretion of Interim Policy," January 14, 2005, Federal Register, Vol. 70, No. 10, pp. 2662-2664.
- 9) NUREG/CR-6850, September 2005, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities."
- 10) RG 1.205, Revision 1, December 2009, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants."
- 11) RIS 2007-19, August 20, 2007, "Process For Communicating Clarifications of Staff Positions Provided in Regulatory Guide 1.205 Concerning Issues Identified During the Pilot Application of National Fire Protection Association Standard 805."

### NEI and Industry Guidance and Standards:

- 12) ANSI/ANS-58.23-2007, November 20, 2007, "American National Standard - Fire PRA Methodology."
- 13) ASME/ANS-RA-S-2007, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Application, Combined PRA Standard."
- 14) ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" (and 2007 addenda ASME RA-Sc-2007, Appendix A).
- 15) NEI 00-01, Revision 1, January 2005, "Guidance for Post-Fire Safe Shutdown Circuit Analysis."
- 16) NEI 00-02, Revision 1, May 2006, "Probabilistic Risk Assessment (PRA) Peer Review Process Guidance."



- 17) NEI 04-02, Revision 2, April 2008, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48(c)."
- 18) "Nuclear Mutual Limited (NML) Property Loss Prevention Standards for Nuclear Generating Stations."
- 19) NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management."
- 20) NUMARC 93-01, Revision 3, July 2000, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

#### Beaver Valley Reports

- 21) 2701.620-000-004, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA Applications."
- 22) 2701.620-000-005, "Multiple Spurious Operation (MSO) Expert Panel Review Report."
- 23) 2701.620-000-012, "Beaver Valley Power Station (BVPS) Units 1 and 2 - Power Block Definition."
- 24) 2701.620-000-013, "Results Report for Beaver Valley Power Station 1 and 2, Task 4.0 - Radioactive Release Transition Review During Fire Suppression Activities."
- 25) 2701.620-000-014, "Nuclear Safety Capability Assessment Methodology Review (Table B-2)."
- 26) 2701.620-000-022, "BV-2 Multi-Compartment Fire Model Analysis."
- 27) 2701.620-000-025, "Current Transformer Investigation For Beaver Valley Power Station."
- 28) 2701.620-000-049, "BVPS Unit 2 Fire Protection Safe Shutdown Operator Manual Action Feasibility Study."
- 29) 2701.620-000-084, "BV2 NFPA 805 MSO-to-SAFE Cross- Reference Report."
- 30) 2701.620-000-085, "Fundamental Fire Protection Program and Design Element Transition Review (Task 1.1) and Review of Fire Area Specific Fire Protection Features (Task 1.2)."
- 31) 2701.620-000-088, "Transition Report Attachment H - NFPA 805 FAQ Summary Table."
- 32) 2701.620-000-091, "Transition Report Attachment K, Existing Licensing Action Review."
- 33) 2701.620-000-092, "Transition Report Attachment L, NFPA 805 Chapter 3 Requirements for Approval."
- 34) 2701.620-000-093, "BV Transition Report Att. T - Clarification of Prior NRC Approvals."
- 35) 2701.620-000-094, "Transition Report Att. F, Fire-Induced Multiple Spurious Operations Resolution."
- 36) 2701.620-000-096, "Fire Area Transition Review."
- 37) 2701.620-000-101, "Non-Power Operational Modes Transition Report."

- 38) 2701.620-000-102, "Transition Report - Partial Package of Non-Associated TR Sections."
- 39) 2701.620-000-103, "Review Recovery Actions for LAR Attachment G."
- 40) 2701.620-000-108, "Transition Report - Orders and Exemptions (Attachment O) and RI-PB Alternatives to NFPA 805 10 CFR 50.48(c)(4) (Attachment P)."
- 41) 2701.620-000-110, "Review of Existing Engineering Equivalency Evaluations Report."
- 42) 2701.620-000-111, "NFPA 805 LAR Table 4-3 Report."
- 43) 2701.620-000-112, "BV Transition Report Att. S – Plant Modifications and Items to be Completed During Implementation."
- 44) 2701.620-000-122, "Attachment V - Fire PRA Quality."
- 45) 2701.620-000-124, "Attachment W - Fire PRA Insights."
- 46) 8700-01.062-0002, "Multiple Spurious Operation (MSO) Expert Panel Review Report."
- 47) 8700-01.062-0005, "NFPA 805 - Thermoset and Thermoplastic Cable Types at BVPS-1 and BVPS-2."
- 48) 8700-01.062-0006, "Associated Circuits Review."
- 49) 8700-01.062-0013, "BV-1 Multi-Compartment Fire Model Analysis."
- 50) 8700-01.062-0043, "BVPS Unit 1 Fire Protection Safe Shutdown Operator Manual Action Feasibility Study."
- 51) 8700.01.062-0044, "BV1 NFPA 805 MSO-to-SAFE Cross-Reference Report."
- 52) 8700-01.062-0049, "Review of Existing Engineering Equivalency Evaluations Report."
- 53) 8700-01.062-0084, "Non-Power Operational Modes Transition Report."
- 54) 8700-01.062-0086, "NFPA 805 LAR Table 4-3 Report."

## ATTACHMENTS

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

985 Pages Attached

**Beaver Valley Power Station, Attachment A1 Records**

141 Pages Attached

## **Transition Report Attachment**

**Beaver Valley Power Station**

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

Transition Report Section: - **Attachments**

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

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

**Beaver Valley Power Station**

**3.1 General**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - N/A

**None**

General. This chapter contains the fundamental elements of the fire protection program and specifies the minimum design requirements for fire protection systems and features. These fire protection program elements and minimum design requirements shall not be subject to the performance-based methods permitted elsewhere in this standard. Previously approved alternatives from the fundamental protection program attributes of this chapter by the AHJ take precedence over the requirements contained herein.

**Compliance Basis:**

This subsection is general explanatory material only and a specific compliance statement is not applicable. For the following sections and subsections where previously approved alternatives are being credited, those specific details are discussed in the compliance statement for each applicable subsection.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- None

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.1**

Intent. A site-wide fire protection plan shall be established. This plan shall document management policy and program direction and shall define the responsibilities of those individuals responsible for the plan's implementation. This section establishes the criteria for an integrated combination of components, procedures, and personnel to implement all fire protection program activities.

**Compliance Basis:**

A site-wide fire protection plan has been established. The Fire Protection Program Procedure defines the administrative authorities, responsibilities, and requirements of BVPS.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.2**

Management Policy Direction and Responsibility. A policy document shall be prepared that defines management authority and responsibilities and establishes the general policy for the site fire protection program.

**Compliance Basis:**

The Fire Protection Program Procedure defines the administrative authorities, responsibilities, and requirements of BVPS.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.2.1**

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

**Compliance Basis:**

The Site Vice President has management control over all organizations involved in fire protection process activities, and has overall responsibility for the Fire Protection Program. The Plant Manager has responsibility for directing the Fire Protection Program and being the management position with authority and available staff personnel knowledgeable in both fire protection and nuclear safety. The Site Fire Marshal has management responsibility for the overall administration, formulation, implementation, and assessment of the effectiveness of the Fire Protection Program. All site positions who have any authority or responsibilities within the Fire Protection Program report either directly or indirectly through the Site Vice President position.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.2.2**

The policy document shall designate a position responsible for the daily administration and coordination of the fire protection program and its implementation.

**Compliance Basis:**

The Fire Protection Program Procedure establishes the Site Fire Marshal as having management responsibility for the overall administration, formulation, implementation, and assessment of the effectiveness of the Fire Protection Program and provides for a single point of contact for all Fire Protection contingencies. The procedure also specifies individual responsibilities for this position.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.2.3**

The policy document shall define the fire protection interfaces with other organizations and assign responsibilities for the coordination of activities. In addition, this policy document shall identify the various plant positions having the authority for implementing the various areas of the fire protection program.

**Compliance Basis:**

The Site Fire Marshal directs and coordinates the efforts associated with the implementation of the Fire Protection Program and is a single point of contact for all Fire Protection contingencies and also assigns specific fire protection program responsibilities of managers of other departments.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

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

**3.2.2.4**

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

**Compliance Basis:**

The administrative procedure does not identify the Authority Having Jurisdiction (AHJ) as the NRC. The procedure is to be updated to define the AHJ as the NRC.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

**Item Number**

BV1-2908

**Item Title:** Procedure Update 1/2-ADM-1900

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.3**

Procedures shall be established for implementation of the fire protection program. In addition to procedures that could be required by other sections of the standard, the procedures to accomplish the following shall be established:

**Compliance Basis:**

Administrative procedures have been established for implementation of the site Fire Protection Program. These procedures accomplish the requirements outlined in the sub-sections of this element.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.3(1)**

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

**Compliance Basis:**

The Fire Protection Program Procedure identifies all fire protection systems and fire protection features surveillances for inspection and testing including fire barriers, fire barrier penetration seals, fire dampers, fire doors, and emergency lights and includes guidance on the maintenance of the fire protection system.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.2.3(2)**

Compensatory actions implemented when fire protection systems and other systems credited by the fire protection program and this standard cannot perform their intended function and limits on impairment duration

**Compliance Basis:**

Complies

The Fire Protection Program Procedure identifies the operability requirements for all parts/components of the fire protection program. It also lists the corresponding required compensatory actions and time requirement when the operability requirements cannot be met.

Will Comply with use of Commitment

An Open Item has been created to review the Fire PRA component/system list to ensure compensatory actions are appropriate with the level of risk created by the unavailable equipment.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2908	<b>Item Title:</b> Procedure Update 1/2-ADM-1900
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.2.3(3)**

Reviews of fire protection program - related performance and trends

**Compliance Basis:**

Complies

The Fire Protection Program Procedure specifies required reviews of the fire protection program.

Will Comply with the Use of Commitment

The Monitoring Program required by NFPA 805 Section 2.6 and described LAR Section 4.6 will include a process that reviews the fire protection program performance and identify trends in performance based on specific performance goals established to measure the effectiveness of the fire protection program. See LAR Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- FENOC QAPM, Rev. 18, "Quality Assurance Program Manual"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

Item Number	Item Title
BV1-2989	Fire Protection Program Monitoring Program

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

**Beaver Valley Power Station**  
**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.3(4)**

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

**Compliance Basis:**

The Fire Protection Program Procedure provides instructions on reviewing modifications and procedure changes for impact on the fire protection program.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1903, Rev. 3, "Fire Protection Program Change Process"
- NOP-SS-3001, Rev. 19, "Procedure Review and Approval"

- NOP-CC-2004, Rev. 10, "Design Interface Reviews and Evaluations"
- NOP-CC-2003, Rev. 18, "Engineering Changes"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.3(5)**

Long-term maintenance and configuration of the fire protection program

**Compliance Basis:**

Administrative procedures assure the long-term maintenance and configuration of the Fire Protection Program.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1903, Rev. 3, "Fire Protection Program Change Process"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.2 Fire Protection Plan**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.2.3(6)**

Emergency response procedures for the plant industrial fire brigade

**Compliance Basis:**

The administration and operation procedures establish and maintain a fire brigade at BV. This includes the regulatory requirements and commitments, responsibilities for fire brigade members as well as other personnel who support the brigade, guidance for fire drills, and qualification and training requirements.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"
- 1/2OM-56B.4A.B, Rev. 6, "Fire Brigade and Fire Fighting Procedure"

- 1/2-ADM-1901, Rev. 3, "FIRE PROTECTION PRE-FIRE PLAN ADMINISTRATIVE CONTROL "
- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3**

A fire prevention program with the goal of preventing a fire from starting shall be established, documented, and implemented as part of the fire protection program. The two basic components of the fire prevention program shall consist of both of the following: (1) Prevention of fires and fire spread by controls on operational activities (2) Design control that restrict the use of combustible materials

**Compliance Basis:**

(1) The Fire Protection Program Procedure illustrates that the fire protection program has controls in place for the prevention of fires and fire spread through the Hot Work Permit process and the control of combustible and flammable materials.

(2) Procedures establish guidelines, requirements, and administrative controls for handling, storage, and use of transient combustible and flammable materials at Beaver Valley Power Station. Plant modifications and permanent plant changes are evaluated for their affect on the Fire Protection Program.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1904, Rev. 3, "Control of Ignition Sources (Hot Work) and Fire Watches"
- NOP-CC-2004, Rev. 10, "Design Interface Reviews and Evaluations"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"
- NOP-CC-2003, Rev. 18, "Engineering Changes"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.1**

The fire prevention program activities shall consist of the necessary elements to address the control of ignition sources and the use of transient combustible materials during all aspects of plant operations. The fire prevention program shall focus on the human and programmatic elements necessary to prevent fires from starting or, should a fire start, to keep the fire as small as possible.

**Compliance Basis:**

The BV fire protection program has implemented programs and procedures to control and address ignition sources and the uses of transient combustible materials during all aspects of plant operations. These subjects are further discussed in related sub-sections of the compliance statements for NFPA 805 Section 3.3.1.2 and 3.3.1.3.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-OM-56B.4A.A, Rev. 2, "Plant Fire Prevention Procedure"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

- 1/2-ADM-1904, Rev. 3, "Control of Ignition Sources (Hot Work) and Fire Watches"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - N/A

**3.3.1.1**

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

**Compliance Basis:**

This is a general introductory statement section. Please refer to the following subsections for the specific NFPA 805 requirements. Upon review of the following subsections, the NFPA 805 code requirements are satisfied and no other additional elements were evaluated.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- None

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.1.1(1)**

Training on fire safety information for all employees and contractors including, as a minimum, familiarization with plant fire prevention procedures, fire reporting, and plant emergency alarms

**Compliance Basis:**

Fire Protection is part of the initial and refresher general employee plant access section of training. Individuals are familiarized with fire prevention procedures, fire reporting, and plant emergency alarms.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-1333 , Rev. 4, "General Employee Training"

- FEN-PAT, Rev. 9, "Plant Access Training"

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.1.1(2)**

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

**Compliance Basis:**

The Fire Protection procedure establishes requirements, administrative controls, and guidelines for handling, storage, and use of transient combustibles and flammable materials. The procedure is applicable to all station employees and contractors.

The Fire Protection Program Procedure states the Fire Marshal is responsible for implementing periodic inspections to minimize the amount of combustibles in plant areas important to safety. A corrective action program is established and implemented that includes prompt identification, documentation, significance evaluation, and correction of conditions adverse to quality.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- FENOC QAPM, Rev. 18, "Quality Assurance Program Manual"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.1.1(3)**

Administrative controls addressing the review of plant modifications and maintenance to ensure that both fire hazards and the impact on plant fire protection systems and features are minimized.

**Compliance Basis:**

Modifications are developed in accordance with procedures requiring the responsible engineer to determine which interfacing organizations need to review the change.

The Fire Protection Program Procedure states the Site Fire Marshal is responsible for ensuring review of proposed work activities to identify potential transient fire hazards and specifying required additional fire protection in the work scope, and for ensuring fire prevention practices are applied in plant activities to limit fires related to ignition sources and/or transient combustibles within established limits.

As discussed in other subsections of this NFPA 805 review, procedures also exist for control of ignition sources and transient combustibles to assist planners, supervisors, and other personnel in the review and conduct of maintenance work orders.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-0816, Rev. 0, "Maintenance Organization and Responsibilities"
- NOP-CC-2004, Rev. 10, "Design Interface Reviews and Evaluations"
- NOP-CC-2003, Rev. 18, "Engineering Changes"

- 1/2-ADM-1903, Rev. 3, "Fire Protection Program Change Process"
- 1/2-ADM-0810, Rev. 15, "Scaffold Erection and Tagging"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.1.2**

Control of Combustible Materials. Procedures for the control of general housekeeping practices and the control of transient combustibles shall be developed and implemented. These procedures shall include but not be limited to the following program elements:

**Compliance Basis:**

Procedures for the control of general housekeeping practices and control of transient combustibles have been developed and implemented. Upon review of the following subsections, the NFPA 805 code requirements are satisfied and no other additional elements were evaluated.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.1.2(1)**

Wood used within the power block shall be listed pressure-impregnated or coated with a listed fire-retardant application.

Exception: Cribbing timbers 6 in. by 6 in. (15.2 cm by 15.2 cm) or larger shall not be required to be fire retardant treated.

**Compliance Basis:**

Complies

The administrative procedure establishes the control of wood and lumber in the protected area.

Will Comply with the Use of Commitment

Admin Procedure to be revised to more closely reflect the subject NFPA 805 requirements for 3.3.1.2(1) - Wood.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

**Item Number**

BV1-2907

**Item Title:** Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

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

**3.3.1.2(2)**

Plastic sheeting materials used in the power block shall be fire-retardant types that have passed NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films, large-scale tests, or equivalent.

**Compliance Basis:**

Will Comply with the Use of Commitment

The administrative procedure establishes "plastic sheeting material shall be fire retardant in accordance with NFPA 701, "Standard Methods of Fire Tests for Flame-Resistant Textiles and Films," with exceptions noted by the Fire Protection System Engineer or Site Fire Marshal."

A procedure update is required to adequately meet the NFPA 805 requirement.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

**Open Items and VFDRs**

Item Number	Item Title:
BV1-2907	Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.1.2(3)**

Waste, debris, scrap, packing materials, or other combustibles shall be removed from an area immediately following the completion of work or at the end of the shift, whichever comes first.

**Compliance Basis:**

Complies

The administrative procedure establishes, "All waste, debris, scrap, rags, oil spills, or other unnecessary Combustible Material resulting from work activity in all plant Fire Areas SHALL be removed/and or cleaned up as soon as possible."

Will Comply with the Use of Commitment

Admin Procedure to be revised to more closely reflect the subject NFPA 805 requirements for 3.3.1.2(3) - Waste.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-OM-56B.4A.A, Rev. 2, "Plant Fire Prevention Procedure"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

**Open Items and VFDRs**

**Item Number**

BV1-2907

**Item Title:** Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.1.2(4)**

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

**Compliance Basis:**

Complies

(1) The Fire Protection Program Procedure states that designated areas have been established in various safety related areas for permanent storage of Transient Combustibles, and that the Fire Hazard Analysis includes a fire load for each of these areas.

(2) The procedure further states that the maximum allowable amount of combustible material in a designated location for permanent storage of Transient Combustibles SHALL be maintained below the fire load allotted to the storage area and that the relative amount of each type of combustible material stored in a permanent storage area may vary as long as the total fire load remains below the fire load specified in the procedure.

Will Comply with the Use of Commitment

Admin Procedure to be revised to more closely reflect the subject NFPA 805 requirements for 3.3.1.2(4) - Designation of Storage Areas.

**Licensing Actions**

- None

**Supporting EEEEs**

- 10080-DMC-0054, Eval#IV-3 R2 A4

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

<b>Item Number</b>	<b>Item Title:</b>
BV1-2907	Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.1.2(5)**

Controls on use and storage of flammable and combustible liquids shall be in accordance with NFPA 30, Flammable and Combustible Liquids Code, or other applicable NFPA standards.

**Compliance Basis:**

Complies

Administrative procedures place controls on the use and storage of flammable and combustible liquids to be in accordance with NFPA 30.

Will Comply with Use of Commitment

NFPA 30 was used in the development of these procedures, and an NFPA 30 code compliance evaluation was completed detailing required Post-LAR procedural updates, as stated in LAR Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-OM-56B.4A.A, Rev. 2, "Plant Fire Prevention Procedure"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2907	<b>Item Title:</b> Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program
<b>Item Number</b>	BV1-2908	<b>Item Title:</b> Procedure Update 1/2-ADM-1900
<b>Item Number</b>	BV1-2909	<b>Item Title:</b> Procedure Update 1/2OM-56B.4A.A to enhance controls of combustibles



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

**Beaver Valley Power Station**  
**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

<b>Item Number</b>	BV1-3018	<b>Item Title:</b> NFPA 30 Procedure Update
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.1.2(6)**

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

**Compliance Basis:**

Complies

Several administrative procedures include requirements for use and control of flammable gases. These procedures have some requirements similar to NFPA 50 and NFPA 50A, which were superseded by NFPA 55.

Will Comply with use of Commitment

NFPA 55, Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks, is the code that incorporated NFPA 50 and NFPA 50A. NFPA 55 would be considered an applicable standard per FAQ 06-0020. Neither this standard nor any other NFPA standard has been referenced in any of the applicable procedures discussed above. Therefore, a commitment was created to incorporate those additional NFPA 55 applicable requirements not already in procedures after confirming that the present controls on use and storage of flammable gases in those procedures as necessary to achieve compliance. The NFPA 55 compliance report identified two noncompliances. Open Items have been created and are included in LAR Attachment S as BV1-2907, BV1-2909, BV2-1570, and BV2-1571.

**Licensing Actions**

- None

**References**

- 1/2-OM-56B.4A.A, Rev. 2, "Plant Fire Prevention Procedure"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Supporting EEEEs**

- No Evaluations

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"
- ARS-BV3-12-144, Rev. 0, "Bulk Hydrogen Storage Code Review"

**Open Items and VFDRs**

<b>Item Number</b>	<b>Item Title:</b>
BV1-2907	Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

<b>Item Number</b>	BV1-2909	<b>Item Title:</b> Procedure Update 1/2OM-56B.4A.A to enhance controls of combustibles
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.1.3.1**

A hot work safety procedure shall be developed, implemented, and periodically updated as necessary in accordance with NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, and NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.

**Compliance Basis:**

Complies

Hot work is controlled through administrative procedures.

Will Comply with the Use of Commitment

An Open Item has been created to review 1/2-ADM-1904 for compliance with NFPA 241, to revise the subject procedure if required, and revise the procedure Section 1.0, Purpose, or Section 3.2, Commitments, to state that the hot work safety procedure is required to be in accordance with NFPA 51B and NFPA 241 as required by NFPA 805 section 3.3.1.3.1.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1904, Rev. 3, "Control of Ignition Sources (Hot Work) and Fire Watches"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

**Item Number**

BV1-2905

**Item Title:** Procedure Update 1/2-ADM-1904 to enhance combustible controls program

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

**Beaver Valley Power Station**  
**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.1.3.2**

Smoking and other possible sources of ignition shall be restricted to properly designated and supervised safe areas of the plant.

**Compliance Basis:**

The Fire Protection Program procedure states station personnel shall not smoke except in designated areas and that smoking areas have been specifically designated and identified with signs.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1904, Rev. 3, "Control of Ignition Sources (Hot Work) and Fire Watches"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.1.3.3**

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

**Compliance Basis:**

The Fire Protection Program procedure states that station personnel shall not use open flame or combustion generated smoke for leak testing purposes. The Control of Ignition Sources and Fire Watches procedure states that all station personnel shall not burn candles on any portion of the Owner Controlled Area or the Protected Area.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-OM-56B.4A.A, Rev. 2, "Plant Fire Prevention Procedure"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1904, Rev. 3, "Control of Ignition Sources (Hot Work) and Fire Watches"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

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

**3.3.1.3.4**

Plant administrative procedure shall control the use of portable electric heaters in the plant. Portable fuel fired heaters shall not be permitted in plant areas containing equipment important to nuclear safety or where there is a potential for radiological releases resulting from a fire.

**Compliance Basis:**

Administrative Procedure to be revised to more closely reflect the subject NFPA 805 requirements 3.3.1.3.4 - Portable Heaters.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1904, Rev. 3, "Control of Ignition Sources (Hot Work) and Fire Watches"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2905	<b>Item Title:</b> Procedure Update 1/2-ADM-1904 to enhance combustible controls program
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.2**

Structural. Walls, floors, and components required to maintain structural integrity shall be of noncombustible construction, as defined in NFPA 220, Standard on Types of Building Construction.

**Compliance Basis:**

Administrative procedures state walls, floors, and components required to maintain structural integrity shall be of noncombustible construction.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-1904, Rev. 3, "Control of Ignition Sources (Hot Work) and Fire Watches"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies with Clarification
- Will Comply with the Use of Commitment

**3.3.3**

Interior Finishes. Interior wall or ceiling finish classification shall be in accordance with NFPA 101, Life Safety Code, requirements for Class A materials. Interior floor finishes shall be in accordance with NFPA 101 requirements for Class I interior floor finishes.

**Compliance Basis:**

Complies with Clarification

An administrative procedure states interior finishes shall have a flame spread rating of less than 25 per ASTM E-84 or equivalent. The insurance requirements are the same as the NFPA 805 standards. The existing original interior wall, ceiling, and floor finish is considered to be compliant with NFPA 805 standards.

Will Comply with the Use of Commitment

Plant Procedures and Procurement Specifications to be revised to more closely reflect the subject NFPA 805 requirements for 3.3.3 - Interior Finishes for future installations.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-PIP-S15, Rev. 4, "Procurement, Receipt, Storage, and Handling of Coating Materials-BVPS#1 and #2"  
- 1/2-PIP-S11, Rev. 9, "PAINTING FOR CONTAINMENT INTERIOR"  
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-PIP-S14, Rev. 4, "Painting for Areas Outside Containment"  
- NEIL, "Nuclear Electric Insurance Limited Loss Control Manual"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2908	<b>Item Title:</b> Procedure Update 1/2-ADM-1900
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.4**

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

**Compliance Basis:**

Complies

The Fire Protection Program procedure and specifications have requirements that thermal insulation materials, radiation shielding materials, ventilation duct materials, and sound proofing materials shall be noncombustible or limited combustible.

Will Comply with the Use of Commitment

Plant Procedures and Procurement Specifications to be revised to more closely reflect the subject NFPA 805 requirements for 3.3.4 - Insulation Materials.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"  
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

**Open Items and VFDRs**

Item Number	Item Title
BV1-2908	Procedure Update 1/2-ADM-1900

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Submit for NRC Approval
- Will Comply with the Use of Commitment

**3.3.5.1**

Wiring above suspended ceiling shall be kept to a minimum. Where installed, electrical wiring shall be listed for plenum use, routed in armored cable, routed in metallic conduit, or routed in cable trays with solid metal top and bottom covers.

**Compliance Basis:**

Submit for NRC Approval

Based on plant walkdowns and specifications/drawings, areas with suspended ceilings exists at Beaver Valley Power Station. The Duquesne Light letter dated October 27, 1976 and BV2 UFSAR document areas above suspended ceilings are free of combustibles.

See Attachment L of the Transition Report for further details on the request for NRC approval of small amounts of potentially non-rated cables above suspended ceilings.

Will Comply with the Use of Commitment

Plant Procedures to be revised to more closely reflect the NFPA 805 requirements for 3.3.5.1 - Suspended Wiring, for future intallation.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 76-10-27, "BVPS-1 Compliance with APCSB 9.5-1"

- BVS-0499, Rev. 1, "Spec. for Suspended Acoustical Ceilings"

- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"

- 2BVS-944, Rev. 0, Add. 4, "Spec. for Suspended Acoustical Ceilings"

- 8700-RA-0001H, Rev. 13, "GENERAL ARRANGEMENT SH 1 - SERVICE BUILDING "

- 8700-RA-0009C, Rev. 8, "Misc. Det's Sh. 3, Turb. & Serv. Bldg"

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

**Item Number**

BV1-2823

**Item Title:** Update Administrative process/engineering controls to address future installation of wiring above a suspended ceiling in accordance with NFPA 805.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.5.2**

Only metal tray and metal conduits shall be used for electrical raceways. Thin wall metallic tubing shall not be used for power, instrumentation, or control cables. Flexible metallic conduits shall only be used in short lengths to connect components.

**Compliance Basis:**

Procedures require only metal to be used for cable trays and conduits, thin wall metallic tubing cannot be used for cables other than lighting or communication unless specifically authorized by the engineers, and constraints are placed on the length of flexible metallic conduit that can be used.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- PIPS E05.3, Rev. 1, "Non-Seismic Conduits and Supports"  
- 1/2-PIP-E04, Rev. 8, "Seismic Conduits and Supports"

- PIPS E02.3, Rev. 2, "Cable Tray and Supports"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies with Clarification
- Complies with use of EEEE
- Submit for NRC Approval

**3.3.5.3**

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

**Compliance Basis:**

Complies with Clarification

Safety-related cables are considered to be compliant due to being constructed to pass the vertical cable tray flame test with oil/burlap flame source or, later, the IEEE 383-1974 flame test. See Attachment T for additional justification.

Complies with use of EEEE

The configuration of non-fire-retardant cables wrapped with fire-retardant material within CV-3 are considered to be compliant based on an engineering evaluation.

Submit for NRC Approval

The unknown cable identified in the cable types report 8700-01.062-0005 has been analyzed by Fire PRA and Detailed Fire Modeling to address a fire initiating from non-qualified fire resistive cable.

**Licensing Actions**

- BV2-27 Cable Construction - Lack of  
Compliance with IEEE-383-1974 Flame  
Test

**Supporting EEEEs**

- 8700-DMC-2653 Eval.#12 R2 A1
- 8700-DMC-2653 Eval. #11 R2 A1
- 10080-DMC-0054, Eval#IV-3 R2 A4
- FPPCE 11-027 Rev.0
- FPPCE 11-026 Rev.0
- FPPCE 11-025 Rev.1
- FPPCE 11-024 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**References**

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"
- 8700-01.062-0005, Rev. C, "NFPA 805 Thermoset and Thermoplastic Cable Types at BVPS Unit #1 and Unit #2"
- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies with Clarification

**3.3.6**

Metal roof deck construction shall be designed and installed so the roofing system will not sustain a self-propagating fire on the underside of the deck when the deck is heated by a fire inside the building. Roof coverings shall be Class A as determined by tests described in NFPA 256, Standard Methods of Fire Tests of Roof Coverings.

**Compliance Basis:**

Complies

The roofing systems on both BV units complies to Class A or Class I roofing systems as described by Factory Mutual Engineering Corporation Bulletin 1-28s

BV Unit 1 uses the installation specification BVS-930, In addition, the BV Unit 1 Unit 1 response to BTP APCSB 9.5-1 Section B.1.(e) stated that "Metal roof deck construction is FM-listed Class 1,".

BV Unit 2 uses the installation specifications 2BVS-930 and 2BVS-400. In addition, the BV Unit 2 SER of Oct. 1985 section 9.5.1.4 stated that "Metal roof deck construction is FM-listed Class 1,". In addition for BV2 the NRC also stated that "This meets Section C.5.a(10) of BTP CMEB 9.5-1, and is, therefore, acceptable."

Complies with Clarification

Technical Evaluation Report (TER) 12157 evaluated the new roofing system for the Intake Structure. This TER compares the heat conductance (C) of the insulation; fire protection rating and wind uplift rating of the new system and the existing roof system and concluded it is equal to the original or existing roofing system being replaced. It states that the new roofing system has an UL Class A fire rating and a Factory Mutual (FM) Class 1-90 wind uplift rating. It also states that the new roofing system specified in 8700-DSS-0100 is acceptable.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- BVS-0416, Rev. 1, "Asphalt and Gravel Roofing and Flashing"
- TER 12157, Rev. 0, "BV-1 Permanent Plant Roofing System Replacement "
- 2BVS-400, Rev. 3, "Steel Roof Deck and Steel Floor Forms"
- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"

- 8700-DSS-0100, Rev. 1, "Procurement Specification for Replacement of BV-1 Permanent Plant Roofing System"
- BTP-CMEB-9.5-1, Rev. 3, "Standard Review Plan"
- 2BVS-930, Add. 5, "Asphalt and Gravel Roofing and Flashing"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.7**

Bulk Flammable Gas Storage. Bulk compressed or cryogenic flammable gas storage shall not be permitted inside structures housing systems, equipment, or components important to nuclear safety.

**Compliance Basis:**

There is no bulk storage of compressed or cryogenic flammable gas within structures housing safety related components. Bulk storage of compressed gases exists outside only. The administrative procedure does not permit bulk storage of flammable gases inside structures containing systems, equipment, or components important to nuclear safety. Flammable gas cylinders are also controlled by administrative procedures.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.7.1**

Storage of flammable gas shall be located outdoors, or in separate detached buildings, so that a fire or explosion will not adversely impact systems, equipment, or components important to nuclear safety. NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites, shall be followed for hydrogen storage.

**Compliance Basis:**

Complies

No bulk compressed or cryogenic flammable gas storage is located within structures housing safety related components. Administrative procedures require bulk storage of flammable gases shall not be permitted inside structures containing systems, equipment, or components important to nuclear safety. Bulk hydrogen and flammable gas storage facilities shall be separated from site buildings or structures by rated fire barriers or spatial separation that complies with applicable NFPA standards; however, not less than 30 feet.

Will Comply with Use of Commitment

Open Items were written because the procedures do not specifically require storage of flammable gas to be outdoors or in separate detached buildings, and NFPA 55 is not referenced in the procedures. The NFPA 55 compliance report identified two noncompliances. Open Items have been created and are included in LAR Attachment S Action Items BV1-2907 and BV1-2908.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"
- ARS-BV3-12-144, Rev. 0, "Bulk Hydrogen Storage Code Review"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

**Item Number**

BV1-2907

**Item Title:** Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**  
**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

<b>Item Number</b>	BV1-2908	<b>Item Title:</b> Procedure Update 1/2-ADM-1900
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies with Clarification

**3.3.7.2**

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

**Compliance Basis:**

Unit 1 - Complies

Plant drawings shows hydrogen storage tanks are positioned so the long axis is not pointed at buildings. This complies with the NFPA 805 requirement.

Unit 2 - Complies with Clarification

Plant drawings show hydrogen storage tanks are positioned so the long axis is pointed at buildings; however, the distance separating the hydrogen tanks and the Turbine building is greater than 100 feet. The existing hydrogen storage tanks satisfy the distance requirements of NFPA codes specifically addressing bulk hydrogen storage. The hydrogen storage tanks comply with clarification.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 8700-RX-0019A, Rev. 2, "Topographic and Surface Features"  
- NFPA 55, Rev. 2010, "Compressed Gases and Cryogenic Fluids Code"

- 8700-RX-0011C, Rev. 2, "Surface Features and Underground Utilities"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.7.3**

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

**Compliance Basis:**

Procedures limit the aligned hydrogen cylinders to only those in use; all others are to be isolated from the system when not in use.

**Licensing Actions**

- None

**References**

- 2OM-35.1.C, Rev. 5, "main Generator and Transformer Description"
- 2OM-35.4.P, Rev. 8, "Filling the Bulk Hyd Stg Bottles from a Hyd Tube Truck"
- 1OM-35.1.C, Rev. 3, "Major Components"
- 1OM-7.4.F, Rev. 9, "Hydrogen Concentration Control"

**Supporting EEEs**

- No Evaluations

- 2OM-35.4.O, Rev. 9, "No 2 Main Generator Hyd Makeup"
- 1OM-35.4.Q, Rev. 8, "Filling the Bulk Hydrogen Storage Bottles from a Hydrogen Tube Truck"
- 1OM-35.4.G, Rev. 7, "Generator Hydrogen Cooling System Startup"
- 2OM-35.4.G, Rev. 12, "No. 2 Main Generator Hydrogen Cooling System Startup"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.8**

Bulk Storage of Flammable and Combustible Liquids. Bulk storage of flammable and combustible liquids shall not be permitted inside structures containing systems, equipment, or components important to nuclear safety. As a minimum, storage and use shall comply with NFPA 30, Flammable and Combustible Liquids Code.

**Compliance Basis:**

Complies

Administrative procedures state bulk storage of flammable and combustible liquids shall not be permitted inside structures containing systems, equipment, or components important to nuclear safety. When this is not possible, the procedures call for evaluation of additional fire prevention controls.

Will Comply with the Use of Commitment

Procedural updates need to be implemented detailing controls required by NFPA 30.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2907	<b>Item Title:</b> Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program
<b>Item Number</b>	BV1-2908	<b>Item Title:</b> Procedure Update 1/2-ADM-1900
<b>Item Number</b>	BV1-2909	<b>Item Title:</b> Procedure Update 1/2OM-56B.4A.A to enhance controls of combustibles

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.9**

Where provided, transformer oil collection basins and drain paths shall be periodically inspected to ensure that they are free of debris and capable of performing their design function.

**Compliance Basis:**

The Deluge Valve Test Procedures state the station service transformer deluge systems are tested on an 18 month frequency, and this wet test will verify that the gravel beds are clear and drain properly (do not overflow).

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 2OST-33.10E, Rev. 3, "System Station Service Transformer 2A Deluge Valve Test"
- 2OST-33.10C, Rev. 4, "System Station Service TFMR 2C Deluge Valve Test"
- 1OST-33.10I, Rev. 6, "1C US Transformer Deluge Valve Test"
- 1OST-33.10G, Rev. 8, "1A Service Station Transformer and ERFs Transformer 3A Deluge Valve Test"
- 1OST-33.10H, Rev. 8, "1B Service Station Transformer and ERFs Transformer 3B Deluge Valve Test"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 2OST-33.10B, Rev. 3, "Main TFMR Deluge Valve Test"
- 2OST-33.10D, Rev. 4, "System Station Service TFMR 2D Deluge Valve Test"
- 1OST-33.10J, Rev. 5, "1D US Transformer Deluge Valve Test"
- 1OST-33.10F, Rev. 6, "Main Transformer Deluge Valve Test"
- 2OST-33.10F, Rev. 5, "System Station Service Transformer 2B Deluge Valve Test"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.10**

Hot Pipes and Surfaces. Combustible liquids, including high flashpoint lubricating oils, shall be kept from coming in contact with hot pipes and surfaces, including insulated pipes and surfaces. Administrative controls shall require the prompt cleanup of oil on insulation.

**Compliance Basis:**

Complies

The administrative procedures state that all waste, debris, scrap, rags, oil spills, or other unnecessary Combustible Material resulting from work activity in all plant Fire Areas shall be removed and/or cleaned up as soon as possible and all transient combustibles shall be protected from ignition sources including hot components or other hot piping.

Will Comply with the Use of Commitment

Plant Procedures to be revised to more closely reflect the subject NFPA 805 requirements for 3.3.10 - Hot Pipes and Surfaces.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-OM-56B.4A.A, Rev. 2, "Plant Fire Prevention Procedure"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2907	<b>Item Title:</b> Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program
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<b>Item Number</b>	BV1-2909	<b>Item Title:</b> Procedure Update 1/2OM-56B.4A.A to enhance controls of combustibles
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.3.11**

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

**Compliance Basis:**

Complies

Procedures require operators to have low tolerance for material condition which includes housekeeping/cleanliness issues and improperly stored combustible material. Procedures are in place to control transient combustible and flammable materials.

Will Comply with the Use of Commitment

Plant Procedures to be revised to more closely reflect the subject NFPA 805 requirements for 3.3.11 - Electrical Equipment.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1906, Rev. 7, "Control of Transient Combustible and Flammable Materials"

- NOP-OP-1002, Rev. 7, "Conduct of Operations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2907	<b>Item Title:</b> Procedure Update 1/2-ADM-1906, PIPS-M16 to enhance combustible controls program
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.12**

Reactor Coolant Pumps. For facilities with non-inerted containments, reactor coolant pumps with an external lubrication system shall be provided with an oil collection system. The oil collection system shall be designed and installed such that leakage from the oil system is safely contained for off normal conditions such as accident conditions or earthquakes. All of the following shall apply.

**Compliance Basis:**

Unit 1 and 2

The requirements of Section 3.3.12 to demonstrate compliance are discussed in the sub-sections (1) through (5) for each unit.

The RCP Oil Collection is seismically evaluated in calculations. The oil collection system is designed and installed such that leakage from the oil system is safely contained for off normal conditions such as accident conditions or earthquakes.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**References**

- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- RS-0016BB, Rev. 3, "RS-0016BB, Oil Lift Motor Oil Collection Assembly"
  
- 11700.34-NP(B)-1402-X-001-1, Rev. 1, "Stress Anal. of Oil Coll. Piping for RCP to Oil Tank RC-TK-4C, Cubicle C"
- 2561.567.000-001, Rev. B, "RCP Oil Collection System Flex Hose, Instruction Manual"
- 12241-NP(T)-XZ870H, Rev. 2, "Seismic Cat II Stress Anal. for Class 4 Small Bore Pipe and Supports Reports"
- 2806.257-920-072, Sht. 1, Rev. C, "RCP OCS Isometrics (Schneider Iso.CI-110-A14) "
- 2806.257-920-074, Sht. 1, Rev. E, "RCP OCS Isometrics (Schneider Iso. CI-110-A16)"
- 2806.257-920-106, Sht. 1, Rev. C, "RCP OCS Isometrics (Schneider Iso. CI-110-A22)"
- 2806.257-920-095, Sht. 1, Rev. D, "RCP OCS Isometrics (Schneider Iso. CI-110-A24)"
- 2806.257-920-090, Sht. 1, Rev. D, "RCP OCS Isometrics (Schneider Iso. CI-110-A30)"
- 2806.257-920-082, Sht. 1, Rev. C, "RCP OCS Isometrics (Schneider Iso. CI-110-A32)"
- 12241-45-S50.13, Rev. 0, "Reactor Cooling Pump Oil Drip Pans Seismic Support"
  
- DCP-194, "RCP Oil Spill Protection"
  
- 10/85, "BV2 SSER, "
  
- RS-0016BA, Rev. 3, "RS-0016BA, Oil Lift Motor Oil Collection Assembly"
- 13387.75-S-120, Rev. 0, "Analysis of Reactor Coolant Pump Motors Oil Retention System for Structural Adequacy"
- 2560.707-000-001, Rev. C, "Flame Arrestor"
  
- 12241-NP(T)-XZ870I , Rev. 2, Add. 1, "Seismic Ca II Stress Anal. for Class 4 Small Bore Pipe and Supports Reports"
- 12241-NP(T)-Xz870F, Rev. 3, "Seismic Cat II Stress Anal. for Class 4 Small Bore Pipe and Supports"
- 2806.257-920-073, Sht. 1, Rev. D, "RCP OCS Isometrics (Schneider Iso. CI-110-A15)"
- 2806.257-920-078, Sht. 1, Rev. D, "RCP OCS Isometrics (Schneider Iso. CI-110-A17)"
- 2806.257-920-106, Sht. 1, Rev. F, "RCP OCS Isometrics (Schneider Iso. CI-110-A23)"
- 2806.257-920-094, Sht. 1, Rev. C, "RCP OCS Isometrics (Schneider Iso. CI-110-A25)"
- 2806.257-920-092, Sht. 1, Rev. D, "RCP OCS Isometrics (Schneider Iso. CI-110-A31)"
- 2806.257-920-083, Sht. 1, Rev. E, "RCP OCS Isometrics (Schneider Iso. CI-110-A33)"
- 2DBD-06, Rev. 14, "Design Basis Document for Reactor Coolant System"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Submit for NRC Approval

**3.3.12(1)**

Reactor Coolant Pumps. For facilities with non-inerted containments, reactor coolant pumps with an external lubrication system shall be provided with an oil collection system. The oil collection system shall be designed and installed such that leakage from the oil system is safely contained for off normal conditions such as accident conditions or earthquakes. All of the following shall apply.

(1) The oil collection system for each reactor coolant pump shall be capable of collecting lubricating oil from all potential pressurized and nonpressurized leakage sites in each reactor coolant pump oil system.

**Compliance Basis:**

Unit 1 and 2

Complies

An oil collection system is installed for each reactor coolant pump (RCP) lubricating oil system. Potential locations of leakage in the RCP lube oil system have shroud enclosures or drip pans. The oil will be collected within these shrouds or drip pans and then be gravity-drained to three oil collection tanks, one for each RCP lube oil system. This oil spillage collection system precludes the possibility of oil making contact with hot piping and catching fire by collecting and draining it to vented closed containers that can hold the entire lube oil system inventory.

Submit for NRC Approval

The collection system is not designed to collect the oil mist escaping the motor in vapor form. A request for NRC approval is being requested in Attachment L to recognize that oil misting from the RCP is a normal expected leakage and cannot be contained.

**Licensing Actions**

- None

**References**

- DCP-194, "RCP Oil Spill Protection"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 1DBD-06, Rev. 9, "Reactor Coolant System"
- 2DBD-06, Rev. 14, "Design Basis Document for Reactor Coolant System"

**Supporting EEEEs**

- No Evaluations

- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"
- UFSAR, Rev. 26, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**  
**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.12(2)**

(2) Leakage shall be collected and drained to a vented closed container that can hold the inventory of the reactor coolant pump lubricating oil system.

**Compliance Basis:**

Unit 1 and 2

The Reactor Coolant System design bases documents state the oil collection tanks can accommodate the entire oil capacity of its associated reactor coolant pump. The tanks are closed, with a vent at the top. The RCP Oil Collection System complies with the NFPA 805 Section 3.3.12(2) requirements for volume and a vented tank.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- DCP-194, "RCP Oil Spill Protection"
- 2DBD-06, Rev. 14, "Design Basis Document for Reactor Coolant System"

- 1DBD-06, Rev. 9, "Reactor Coolant System"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.12(3)**

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

**Compliance Basis:**

Unit 1 and 2

A flame arrestor is located on each of the 3 RCP Oil Collection Tanks.

**Licensing Actions**

- None

**References**

- 06.024-0704 (CI-19402), Rev. 1, "OIL COLLECTION SYSTEM FOR REACTOR COOLANT PUMP 1C "
- 06.024-0707 (CI-19406), Rev. 1, "OIL COLLECTION SYSTEM FOR REACTOR COOLANT PUMP TANK A"
- 10080-RP-0070F, Rev. 4, "Reactor Coolant Pump Oil Collection System"
- 2560.707-000-001, Rev. C, "Flame Arrestor"
- 2DBD-06, Rev. 14, "Design Basis Document for Reactor Coolant System"

**Supporting EEEs**

- No Evaluations

- 06.024-0706 (CI-19404), Rev. 1, "OIL COLLECTION SYSTEM FOR REACTOR COOLANT PUMP 1B "
- 8700-RM-0406-003, Rev. 9, "Valve OPER NO Diagram - Reactor Coolant System"
- 10080-RP-0070G , Rev. 1, "Reactor Coolant Pump Oil Collection System"
- 1DBD-06, Rev. 9, "Reactor Coolant System"
- 8700-RM-34A, Sht. 1, Rev. 38, "Flow Diagram Vent and Drain System"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Submit for NRC Approval

**3.3.12(4)**

(4) Leakage points on a reactor coolant pump motor to be protected shall include but not be limited to the lift pump and piping, overflow lines, oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and the oil reservoirs, where such features exist on the reactor coolant pumps.

**Compliance Basis:**

Complies

Design documents depict that potential leakage points have protective enclosures or collection drip pans to capture and drain the oil into the RCP Oil Collection System collection tank.

Submit for NRC Approval

See Attachment L of the Transition Report for further details on the request for NRC approval for evaluations of oil misting from the reactor coolant pumps/motors.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 8700-RS-0016AK, Rev. 2, "RCP Oil Collection Assemblies"
- 10080-RS-0050M , Rev. 2, "Reactor Coolant Pump Oil Collection System General Assembly"
- 2DBD-06, Rev. 14, "Design Basis Document for Reactor Coolant System"
- 8700-RM-34A, Sht. 1, Rev. 38, "Flow Diagram Vent and Drain System"

- 8700-DMC-0319 (13387.75-NM(B)-233-ID), Rev. 0, "Reactor Coolant Pump Oil Overflow Storage Tanks"
- 1DBD-06, Rev. 9, "Reactor Coolant System"
- 10080-RM-0075C, Sht. 3, Rev. 8, "Flow Diagram Reactor Coolant Piping"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Beaver Valley Power Station**

**3.3 Prevention**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.3.12(5)**

(5) The collection basin drain line to the collection tank shall be large enough to accommodate the largest potential oil leak such that oil leakage does not overflow the basin.

**Compliance Basis:**

Unit 1 and 2

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

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 8700-DMC-3790, Rev. 0, "BV-1 RCP Lube Oil Collection Piping Calculation to Ensure No Overflow Concern Exists"
- 10080-N-0543, Rev. 0, "RCP Lift Pump Oil Enclosure Volume Calculation"

- 10080-DMC-0816, Rev. 0, "RCP Oil Collection System Tank Volume Calculation"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - N/A

**3.4.1**

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

**Compliance Basis:**

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

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- None

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies with Clarification
- Will Comply with the Use of Commitment

**3.4.1(a)**

A fully staffed, trained, and equipped fire-fighting force shall be available at all times to control and extinguish all fires on site. This force shall have a minimum complement of five persons on duty and shall conform with the following NFPA standards as applicable:

- (1) NFPA 600, Standard on Industrial Fire Brigades (interior structural fire fighting).
- (2) NFPA 1500, Standard on Fire Department Occupational Safety and Health Program.
- (3) NFPA 1582, Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians.

**Compliance Basis:**

Complies

The fire brigade Procedure states a fire brigade is established, trained, and equipped to execute the necessary actions during an emergency to alleviate or minimize consequences. A minimum of five (5) qualified brigade members per shift will be available onsite at BVPS to respond to either unit at all times.

NFPA 1500 and NFPA 1582 are not applicable to BVPS as defined within their respective scope statements.

Comply with Clarification

The station meets the intent of several sections of NFPA 600, as justified within the code compliance report.

Will Comply with Use of a Commitment

Code compliance report identified two open items which require future action and which are identified in LAR Attachment S (procedure changes and review of NFPA 1081).

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**References**

- |  |  |
|--|--|
| - 1/2-ADM-1902, Rev. 10, "Fire Brigade"  | - 1/2-OM-48.1.B, Rev. 7, "Operations Shift Complement and Functions" |
| - 07-11-13, "Close-out of NFPA 805 FAQ 06-0007, Specific Clarification Concerning Plant Fire Brigades (ML072560733)" | - ARS-BV3-13-175, Rev. 0, "NFPA 600 Code Compliance Report"          |

**Open Items and VFDRs**

<b>Item Number</b>	BV1-3019	<b>Item Title:</b> NFPA 1081 Requirement
<b>Item Number</b>	BV1-3020	<b>Item Title:</b> Fire Brigade Procedure Changes

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.1(b)**

Industrial fire brigade members shall have no other assigned normal plant duties that would prevent immediate response to a fire or other emergency as required.

**Compliance Basis:**

The administrative procedure requires the site fire brigade members shall have no other duties preventing immediate response to a fire or emergency.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.1(c)**

During every shift, the brigade leader and at least two brigade members shall have sufficient training and knowledge of nuclear safety systems to understand the effects of fire and fire suppressants on nuclear safety performance criteria. Exception to (c): Sufficient training and knowledge shall be permitted to be provided by an operations advisor dedicated to industrial fire brigade support.

**Compliance Basis:**

Procedures state the Fire Brigade Chief and at least two brigade members shall be operations personnel who have sufficient knowledge of safety-related systems to understand the effects of a fire and fire suppressants on the safe shutdown of the unit.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

- 1/2-ADM-1336, Rev. 3, "Fire Protection Training"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
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**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.1(d)**

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

**Compliance Basis:**

Procedures require station personnel to report a fire immediately; the Fire Brigade is immediately activated if a fire is reported over the radio, GAI-Tronics, or telephone and is in the judgment of the person receiving the report, a valid report. It also requires immediate fire brigade activation if multiple confirming alarms or a Honeywell Early Warning area alarm are/is received.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2OM-56B.4A.B, Rev. 6, "Fire Brigade and Fire Fighting Procedure"  
- FEN-PAT, Rev. 9, "Plant Access Training"

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.4.1(e)**

Each industrial fire brigade member shall pass an annual physical examination to determine that he or she can perform the strenuous activity required during manual firefighting operations. The physical examination shall determine the ability of each member to use respiratory protection equipment.

**Compliance Basis:**

Complies

Procedures require that the BVPS Health Services SHALL conduct annual physical examinations, to determine the ability of fire brigade members to perform strenuous vigorous activity.

Will Comply with the Use of Commitment

Administrative procedures do not specifically include the requirement for determining the ability of each member to use respiratory protection equipment. Administrative procedures will be updated to include wording from NFPA 805.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

- "OSHA Standard 29 CFR 1910.134"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2903	<b>Item Title:</b> Procedure Update 1/2-ADM-1902 to meet requirements of NFPA 805
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.4.2**

Current and detailed pre-fire plans shall be available to the industrial fire brigade for all areas in which a fire could jeopardize the ability to meet the performance criteria described in Section 1.5.

**Compliance Basis:**

Complies

Administrative procedures ensure that Pre-Fire Plans are detailed, kept current, and are accessible to the fire brigade.

Will Comply with the Use of Commitment

Pre-fire-plans to be created for areas determined to have potential to jeopardize the ability of the plant to meet performance criteria as described in Section 1.5. All Pre-fire-plans to be reviewed and updated as determined to be necessary to meet the intent of this NFPA 805 requirement 3.4.2 - Pre-Fire Plans. Refer to Attachment S for Commitment to perform or to provide justification for why action not required.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1901, Rev. 3, "FIRE PROTECTION PRE-FIRE PLAN  
ADMINISTRATIVE CONTROL "

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2371	<b>Item Title:</b> Update fire brigade pre-fire plans and training materials
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.4.2.1**

The plans shall detail the fire area configuration and fire hazards to be encountered in the fire area, along with any nuclear safety components and fire protection systems and features that are present.

**Compliance Basis:**

Complies

Pre-fire Plans are controlled by procedure and include details on potential hazards, nuclear safety components, and fire protection features in the area.

Will Comply with the Use of Commitment

An Attachment S item is committed to either create pre-fire plans for transitioning compartments that do not have established Pre-Fire Plans or to provide justification why a given compartment does not require a Pre-Fire Plan.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1901, Rev. 3, "FIRE PROTECTION PRE-FIRE PLAN  
ADMINISTRATIVE CONTROL "

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2371	<b>Item Title:</b> Update fire brigade pre-fire plans and training materials
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.2.2**

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

**Compliance Basis:**

Administrative procedure for Units 1 and 2 defines one of the responsibilities of the Site Fire Marshal position as being the individual who is responsible for ensuring that Pre-Fire Plans (PFPs) are properly prepared, revised, reviewed and approved, and is responsible for the overall ownership of the PFPs.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1901, Rev. 3, "FIRE PROTECTION PRE-FIRE PLAN  
ADMINISTRATIVE CONTROL "

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.2.3**

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

**Compliance Basis:**

The administrative procedure states that the Pre-Fire Plans shall be assembled in a Pre-Fire Plan Manual, and that Pre-Fire Plan Manuals shall be located in the Control Rooms, Fire Brigade Room, and Fire Van. A laminated, single page, condensed version of the Pre-Fire Plan shall be included in addition to the full procedure. The condensed version can be supplied to the entry team if desired.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1901, Rev. 3, "FIRE PROTECTION PRE-FIRE PLAN  
ADMINISTRATIVE CONTROL "

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies with Clarification

**3.4.2.4**

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

**Compliance Basis:**

The pre-fire plans do contain information on what the Fire Brigade will encounter in a location but do not specifically address coordination with other plant groups.  
Site procedures address coordination with other plant groups during fire emergencies.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"
- 1/2-EPP-IP-8.1, Rev. 13, "Fires in Radiologically Controlled Areas"
- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

- 1/2-ADM-1901, Rev. 3, "FIRE PROTECTION PRE-FIRE PLAN  
ADMINISTRATIVE CONTROL "
- 1/2OM-56B.4A.B, Rev. 6, "Fire Brigade and Fire Fighting Procedure"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.3**

Industrial fire brigade members and other plant personnel who would respond to a fire in conjunction with the brigade shall be provided with training commensurate with their emergency responsibilities.

**Compliance Basis:**

Administrative procedures outline a training program for fire brigade members and other plant personnel which enables them to safely and effectively respond to site emergencies.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

- 1/2-ADM-1336, Rev. 3, "Fire Protection Training"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.4.3(a)**

Plant Industrial Fire Brigade Training. All of the following requirements shall apply.

(1) Plant industrial fire brigade members shall receive training consistent with the requirements contained in NFPA 600, Standard on Industrial Fire Brigades, or NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, as appropriate.

(2) Industrial fire brigade members shall be given quarterly training and practice in fire fighting, including radioactivity and health physics considerations, to ensure that each member is thoroughly familiar with the steps to be taken in the event of a fire.

(3) A written program shall detail the industrial fire brigade training program.

(4) Written records that include but are not limited to initial industrial fire brigade classroom and hands-on training, refresher training, special training schools attended, drill attendance records, and leadership training for industrial fire brigades shall be maintained for each industrial fire brigade member.

**Compliance Basis:**

Complies

(1) Fire Brigade training is performed, and the administrative procedure states that it meets the requirements of OSHA Standard 29 CFR 1910.156(C), 29 CFR 1910.134(g)(4), 10 CFR 50.48, NFPA 27-1976, and the guidelines established in BTP CMEB 9.5-1.

(2) Fire Brigade members annually participate in training sessions in actual fire extinguishment, and each operating shift fire brigade participates quarterly in preplanned fire drills to check the fire brigade's familiarity with the anticipated conditions and hazards. Fire Brigade members also participate in classroom type instruction that requires the entire program to be repeated every two years. Quarterly, Fire Brigade meetings are held to review changes in the fire protection program and other subjects as necessary.

(3) Site Training is responsible for the development, implementation, and revision of the fire training program, and is responsible for the coordinating, tracking, scheduling, and providing class room and practical Fire Brigade training. It is documented in a written fire brigade training program.

(4) Fire Brigade training and qualification records are maintained for the duration of the Facility Operating License.

Will Comply with Use of Commitment

An open item, BV1-2371, was created and added to Attachment S to follow up procedural changes based on the conclusion of the NFPA 600 Code Compliance

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

report.

**Licensing Actions**

- None

**References**

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"
- ARS-BV3-13-175, Rev. 0, "NFPA 600 Code Compliance Report"

**Supporting EEEEs**

- No Evaluations

- 1/2-ADM-1336, Rev. 3, "Fire Protection Training"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2371	<b>Item Title:</b> Update fire brigade pre-fire plans and training materials
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.3(b)**

Training for Non-Industrial Fire Brigade Personnel. Plant personnel who respond with the industrial fire brigade shall be trained as to their responsibilities, potential hazards to be encountered, and interfacing with the industrial fire brigade.

**Compliance Basis:**

The Administrative procedure states Radiation Protection personnel are to assist the Fire Brigade in search and rescue, perform radiation monitoring, perform or assist in first aid/CPR, and assist the brigade as directed by the Fire Brigade Chief. Personnel receive classroom and practical training commensurate with those identified duties as part of their job specific training programs.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

- 1/2-ADM-1336, Rev. 3, "Fire Protection Training"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.3(c)**

Drills. All of the following requirements shall apply.

- (1) Drills shall be conducted quarterly for each shift to test the response capability of the industrial fire brigade.
- (2) Industrial fire brigade drills shall be developed to test and challenge industrial fire brigade response, including brigade performance as a team, proper use of equipment, effective use of pre-fire plans, and coordination with other groups. These drills shall evaluate the industrial fire brigade's abilities to react, respond, and demonstrate proper fire-fighting techniques to control and extinguish the fire and smoke conditions being simulated by the drill scenario.
- (3) Industrial fire brigade drills shall be conducted in various plant areas, especially in those areas identified to be essential to plant operation and to contain significant fire hazards.
- (4) Drill records shall be maintained detailing the drill scenario, industrial fire brigade member response, and ability of the industrial fire brigade to perform as a team.
- (5) A critique shall be held and documented after each drill.

**Compliance Basis:**

The administrative procedures include the following requirements:

- (1) The Fire Brigade participates in fire drills at least once a quarter to test their ability to respond and extinguish fires.
- (2) The fire drills include use of personal protective equipment, use of firefighting equipment, proper fire fighting tactics, and search and rescue techniques. The drills test the ability of the fire brigade to respond and extinguish fires.
- (3) Personnel conducting fire drills shall select an area for the drill based on PRA ranking, fire potential, a perceived need for additional training in a given area, and the potential consequences of a fire in a given area.
- (4) Fire drill documentation consists of a Fire Brigade Drill Evaluation Form, a copy of the training roster, and the drill scenario; documentation is submitted to the station records.
- (5) A critique is required for each drill.

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Licensing Actions**

- None

**References**

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

**Open Items and VFDRs**

-None

**Supporting EEEEs**

- No Evaluations

- 1/2-ADM-1336, Rev. 3, "Fire Protection Training"

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.4**

Protective clothing, respiratory protective equipment, radiation monitoring equipment, personal dosimeters, and fire suppression equipment such as hoses, nozzles, fire extinguishers, and other needed equipment shall be provided for the industrial fire brigade. This equipment shall conform with the applicable NFPA standards.

**Compliance Basis:**

Complies

Operating procedures state that protective clothing, respiratory protective equipment, radiation monitoring, and fire suppression equipment shall be provided for the industrial fire brigade. The equipment is surveyed on a regular basis to ensure equipment is stocked and in working condition.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- NFPA 600, "Industrial Fire Brigades"
- 1/2-ADM-1902, Rev. 10, "Fire Brigade"
- 1/2OST-33.31, Rev. 16, "Fire Brigade Equipment Test"

- 1/2OM-56B.4A.B, Rev. 6, "Fire Brigade and Fire Fighting Procedure"
- 1/2OST-33.33, Rev. 8, "Fire Protection Equipment Inventory Verification"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.5.1**

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

**Compliance Basis:**

The administrative procedure describes the interaction between the power station and outside emergency responders, and the distribution of the plan is restricted to the county emergency management services and fire departments located in the immediate vicinity of the plant.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.5.2**

Fire fighters from the off-site fire authorities who are expected to respond to a fire at the plant shall be offered site-specific training and shall be invited to participate in a drill at least annually.

**Compliance Basis:**

The Emergency Preparedness Plan states representatives of local fire companies participating in the Mutual Aid Program will be provided training material and invited to participate in a drill annually.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-EPP-PLAN-SECTION-8, Rev. 22, "EPP PLAN SECTION 8 - MAINTAINING PREPAREDNESS"

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.5.3**

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

**Compliance Basis:**

Procedures for plant security and radiation protection address off-site fire authority response.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- BVBP-RP-0027, Rev. 1, "Guidelines for Firefighter Dosimetry Issue"
- SP-18.2, Rev. 12, "Emergency Preparedness Plan Traffic and Access Control"

- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.4 Industrial Fire Brigade**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.4.6**

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

**Compliance Basis:**

The Beaver Valley radio system and additional communication systems provide effective communication capabilities for the Fire Brigade.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 1/2OM-56B.4A.B, Rev. 6, "Fire Brigade and Fire Fighting Procedure"

- 1/2-EPP-PLAN-SECTION-8, Rev. 22, "EPP PLAN SECTION 8 - MAINTAINING PREPAREDNESS"

- 1/2-EPP-IP-1.2, Rev. 28, "Communications and Dissemination of Information"

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.1**

A fire protection water supply of adequate reliability, quantity, and duration shall be provided by one of the two following methods.

(a) Provide a fire protection water supply of not less than two separate 300,000-gal (1,135,500-L) supplies.

(b) Calculate the fire flow rate for 2 hours. This fire flow rate shall be based on 500 gpm (1892.5 L/min) for manual hose streams plus the largest design demand of any sprinkler or fixed water spray system(s) in the power block as determined in accordance with NFPA 13, Standard for the installation of Sprinkler Systems, or NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection. The fire water supply shall be capable of delivering this design demand with the hydraulically least demanding portion of fire main loop out of service.

**Compliance Basis:**

Unit 1 and 2 share common fire pumps.

The source of the water for the fire protection system is the Ohio River. Separation suction lines are provided for each pump. Therefore, its supply capabilities are in excess of two (2) hour required volume for sprinkler system activation and adequate hose stream allowance when using either of the separated fire pumps as allowed in Exception 1 on subsection 3.5.2.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 8700-RB-0016B, Rev. 16, "Unit 1 Flow Diagram, Fire Protection"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.2**

The tanks shall be interconnected such that fire pumps can take suction from either or both. A failure in one tank or its piping shall not allow both tanks to drain. The tanks shall be designed in accordance with NFPA 22, Standard for Water Tanks for Private Fire Protection.

Exception No. 1: Water storage tanks shall not be required when fire pumps are able to take suction from a large body of water (such as a lake), provided each fire pump has its own suction and both suctions and pumps are adequately separated.

Exception No. 2: Cooling tower basins shall be an acceptable water source for fire pumps when the volume is sufficient for both purposes and water quality is consistent with the demands of the fire service.

**Compliance Basis:**

Unit 1 and 2

This section requirement is not applicable because the source of water is the Ohio River and there are no storage tanks. The two main fire pumps are arranged so that either fire pump can be isolated with valves for maintenance purposes and the other fire pump can still supply the Units 1 and 2 fire protection systems. This arrangement meets Exception No. 1.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"

- 8700-RB-0016B, Rev. 16, "Unit 1 Flow Diagram, Fire Protection"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.5.3**

Fire pumps, designed and installed in accordance with NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, shall be provided to ensure that 100 percent of the required flow rate and pressure are available assuming failure of the largest pump or pump power source.

**Compliance Basis:**

Complies

*The Intake Structure building is where the two fire pumps reside and they are shared between Unit 1 and Unit 2. The BV fire protection specification of 1970 specified and purchased two vertical turbine-type fire pumps, one motor-driven and one engine-driven, as well as auxiliary equipment, and a pressure maintenance system. It required that "all equipment and tests shall comply with the requirements of the National Fire Code No. 20 – Standard for the Installation of Centrifugal Fire Pumps (latest edition). BV1 and BV2 comply with the requirements of 3.5.3 since the water supply system can deliver the required water demand with one pump out of service.*

Will Comply

Revise the fire pump test procedure to clarify the pump conditions of water level, condition of the pump, and that the suction pipe is not obstructed.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 8700-DMC-3079, Rev. 1, "Fire Pump Minimum Operating Curve"  
- 1/2OST-33.12, Rev. 11, "Fire Protection System Loop Flow Test"

- BVS-0366, Rev. 1, "Specification for Fire Pumps and Drivers"  
- 10080-B-0438, Rev. 0, Add. 1, "Turbine Bldg., Under Operating Floor Sprinkler System, Conformance with NFPA-850 "

**Open Items and VFDRs**

<b>Item Number</b>	BV1-3026	<b>Item Title:</b> Fire Pump 150% Procedure Statement
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.4**

At least one diesel engine driven fire pump or two more seismic Category I Class IE electric motor driven fire pumps connected to redundant Class IE emergency power buses capable of providing 100 percent of the required flow rate and pressure shall be provided.

**Compliance Basis:**

The BV water supply system consists of two fire pumps shared between Unit 1 and 2: one electronically driven and the other diesel driven. These are two 100-percent capacity vertical turbine type fire pumps.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 8700-RB-0016B, Rev. 16, "Unit 1 Flow Diagram, Fire Protection"

- UFSAR, Rev. 26, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies with Clarification

**3.5.5**

Each pump and its driver and controls shall be separated from the remaining fire pumps and from the rest of the plant by rated fire barriers.

**Compliance Basis:**

Unit 1 and 2 share common fire pumps.

Complies

The fire pumps, one diesel and one electric, are located in the intake structure in separate seismic Class I cubicles with 3-hour fire rated separation. The intake structure compartments that house the river water, raw water, and fire pumps are all separated from each adjacent compartment by concrete walls.

Complies with Clarification.

An assessment of the fire pump control circuits was completed and the report concluded for a postulated fire rendering both fire pumps unavailable and considering prompt detection and the availability of alternate water supplies for manual firefighting, the existing configuration of the fire pump control circuits is acceptable.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- 8700-RB-26B, Rev. 11, "Building Intake Structure SH-2"
- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"
- ARS-BV3-13-178, Rev. 0, "Assessment of Separation of Fire Pump Control Circuits"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.6**

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

**Compliance Basis:**

The Unit 1 and 2 shared fire pumps are automatically started in sequence from pressure switch signals and are manually shut down at the local control panels. A drop in the fire main header pressure will actuate the motor-driven fire pump, and a further drop in pressure will actuate the engine-driven fire pump. The pumps can be started remotely from the control room or from local control panels.

**Licensing Actions**

- None

**References**

- 10M-33.4.ACL, Rev. 1, "BV1 Motor Driven Fire Pump Running"
- 10M-33.4.A, Rev. 2, "Water System Startup"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 11700-LSK-20-4B, Sht. 1, Rev. 8, "Logic Diagram Engine Driven Fire Pump"
- 10M-33.4.X, Rev. 6, "FPS Pressure Maintenance Using Filtered Water"
  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 10ST-33.8, Rev. 22, "Diesel Engine Driven Fire Pump Operation Test"

**Supporting EEEEs**

- No Evaluations

- 10M-33.4.ACB, Rev. 1, "Engine Driven Fire Pump"
- 76-10-27, "BVPS-1 Compliance with APCSB 9.5-1"
- 11700-LSK-20-4C, Sht. 2, Rev. 7, "Logic Diagram Engine Driven Fire Pump"
  
- 11700-LSK-20-4A, Rev. 7, "Logic Diagram Motor Driven Fire Pump"
- UFSAR, Rev. 26, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"
- 10ST-33.7, Rev. 17, "Motor Driven Fire Pump Operation Test"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.7**

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

**Compliance Basis:**

The source of water for fire protection is the Ohio River. Separate supply headers from the fire pumps to the Unit 1 yard fire main loop are provided. There are two connections from the Unit 1 yard fire main loop to the BVPS Unit 2 yard fire main loop and sectionalizing valves are provided throughout the system as well as between the pump connections to the loop to allow either fire pump to be isolated for maintenance without affecting the ability of the other pump from supplying the Unit 2 yard fire main loop.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 8700-RM-0433-002, Rev. 19, "Valve Oper No Diagram Fire Protection Water"

- 8700-RM-0433-001, Rev. 20, "Valve Oper No Diagram Fire Protection Water"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.8**

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

**Compliance Basis:**

The fire protection water system pressure maintenance is provided normally by a cross-connection to the Unit 1 Filtered Water System, and available for use is a jockey pump and hydropneumatic tank.

**Licensing Actions**

- None

**References**

- 1OM-33.4.A, Rev. 2, "Water System Startup"
- 8700-RB-0016B, Rev. 16, "Unit 1 Flow Diagram, Fire Protection"
- 8700-DMC-3446, Rev. 0, "Flow Calculation For DCP-2199"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 8700-RM-0433-001, Rev. 20, "Valve Oper No Diagram Fire Protection Water"

**Supporting EEEEs**

- No Evaluations

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- 1OM-33.4.X, Rev. 6, "FPS Pressure Maintenance Using Filtered Water"
- UFSAR, Rev. 26, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"
- 8700-RM-0432-009, Rev. 19, "Valve Oper No Diagram, Filtered Water System"

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.9**

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

**Compliance Basis:**

Pump running alarms are provided for each of the fire pumps and are displayed on the Unit 1 annunciators.

The Unit 1 Alarm Response Procedures direct the operator to also check the Unit 2 "AREA FIRE" annunciators as well as the Unit 1 "AREA FIRE" annunciators in order to determine if any monitored water type suppression systems are flowing water.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 10M-33.4.ACL, Rev. 1, "BV1 Motor Driven Fire Pump Running"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- UFSAR, Rev. 26, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"

- 10M-33.4.ACB, Rev. 1, "Engine Driven Fire Pump"
- 10M-33.1.E, Rev. 11, "Specific Instrumentation & Controls"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies with Clarification
- Will Comply with the Use of Commitment

**3.5.10**

An underground yard fire main loop, designed and installed in accordance with NFPA 24, Standard for the Installation of private Fire Service Mains and Their Appurtenances, shall be installed to furnish anticipated water requirements.

**Compliance Basis:**

Unit 1 and 2

Complies

The underground yard fire main loop is connected and extends around both Unit 1 and Unit 2 structures. The loop is furnished, installed, and tested utilizing NFPA 24-1973.

Complies with Clarification

There are procedures available that flows water back through the fire hydrants or the fire test manifold to pressurize the fire water system using the portable pump (i.e. fire trucks) when the fire pumps are not available in lieu of using building fire department connections.

Will Comply with the Use of Commitment

New hydraulic calculations are to be performed verifying that the appropriate supply requirements of the fire hose stations and water based sprinkler systems can be delivered by the underground loop as documented in Action Item BV1-2833.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**References**

- 76-10-27, "BVPS-1 Compliance with APCSB 9.5-1"
- 8700-RB-0002S, Sht. 2, Rev. 6, "General Arrangement Fire Protection System"
- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"
- UFSAR, Rev. 26, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"
- 8700-RB-0002V, Sht. 5, Rev. 4, "General Arrangement Fire Protection"
- 1OM-33.4.S, Rev. 4, "Portable Fire Pump Operating While 1FP-P-1 and/or 2 are O.O.S"
- BVS-330, Rev. 0, "Yard Sewers, Fire, Oil and Domestic Water Lines"
- 2BVS-912, Rev. 4, "Specification for Yard Sewers, Fire and Domestic Water Systems"
- CR 06-11700, "NFPA 805 - FIRE DEPT CONNECTION IS NOT PROVIDED IN ACCORDANCE WITH NFPA 24"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 2B-14, Rev. 0, "Yard Pipe Sizing"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2833	<b>Item Title:</b> Hydraulic Calculations - Water Supply
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Submit for NRC Approval

**3.5.11**

Means shall be provided to isolate portions of the yard fire main loop for maintenance or repair without simultaneously shutting off the supply to both fixed fire suppression systems and fire hose stations provided for manual backup. Sprinkler systems and manual hose station standpipes shall be connected to the plant fire protection water main so that a single active failure or a crack to the water supply piping to these systems can be isolated so as not to impair both the primary and backup fire suppression systems.

**Compliance Basis:**

Unit 1 - Submit for NRC Approval

There are locations where a single active failure or a crack in the interior fire protection water supply piping could not be isolated without impairing both the primary fixed suppression and the backup manual hose stations. See Attachment L for justification on the water supply system.

Unit 2 - Complies

Cross connections through the Unit 2 buildings ensure no single failure in the water supply system will impair both primary and backup fire protection. A single active failure or a crack in a moderate energy line in any fire suppression system does not impair the primary and/or backup fire suppression capability.

**Licensing Actions**

- None

**References**

- 76-10-27, "BVPS-1 Compliance with APCSB 9.5-1"
- 10080-RB-0091A, Sht. 1, Rev. 27, "Flow Diagram Fire Protection"
- 8700-RM-0433-002, Rev. 19, "Valve Oper No Diagram Fire Protection Water"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 10080-RB-0091B, Sht. 2, Rev. 13, "Flow Diagram Fire Protection"
- 10080-RB-0091G, Sht. 7, Rev. 19, "Flow Diagram Fire Protection"

**Supporting EEEEs**

- No Evaluations

- 8700-RB-0030E, Rev. 2, "BLDG SERV SH 5 CABLE VAULT & SAFEGUARD AREA"
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 10080-RB-0091C, Sht. 3, Rev. 17, "Flow Diagram Fire Protection"
- 1DBD-33B, Rev. 14, "Fire Protection System"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.12**

Threads compatible with those used by local fire departments shall be provided on all hydrants, hose couplings, and standpipe risers.

Exception: Fire departments shall be permitted to be provided with adapters that allow interconnection between plant equipment and the fire department equipment if adequate training and procedures are provided.

**Compliance Basis:**

*Specifications state that hydrants, hose couplings, and standpipe rises are provided with threads compatible with local fire departments.*

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- BVS-330, Rev. 0, "Yard Sewers, Fire, Oil and Domestic Water Lines"  
- 2BVS-912, Rev. 4, "Specification for Yard Sewers, Fire and Domestic Water Systems"

- 2BVS-0914, Rev. 4, "Specification for Interior Fire Protection System"  
- BVS-0435, Rev. 0, Add. 1, "Hot Water - Chilled Water and Interior Fire Lines"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.5.13**

Headers fed from each end shall be permitted inside buildings to supply both sprinkler and standpipe systems, provided steel piping and fittings meeting the requirements of ANSI B31.1, Code for Power Piping, are used for the headers (up to and including the first valve) supplying the sprinkler systems where such headers are part of the seismically analyzed hose standpipe system. Where provided, such headers shall be considered an extension of the yard main system. Each sprinkler and standpipe system shall be equipped with an outside screw and yoke (OS&Y) gate valve or other approved shutoff valve.

**Compliance Basis:**

Unit 1 - Complies

BV1 headers were installed to a piping specification that utilized only steel piping, but permitted the use of steel, malleable iron, or cast iron fittings, and cast iron, bronze, brass, or steel valves. Gate valves for systems and standpipes are specified as OS&Y type or other approved indicating type. At the time of construction and commercial operation the BV1 fire protection piping was not required to be designed to B31.1 or remain functional after a seismic event.

Unit 2 - Complies

Piping and fittings of all internal piping in safety-related areas is in compliance with the requirements of ANSI B31.1, Power Piping and is seismically-analyzed and seismically supported for SSE. Each sprinkler header and hose rack header is supplied with monitored outside screw and yoke isolation valves.

**Licensing Actions**

- None

**References**

- 2BVS-0914, Rev. 4, "Specification for Interior Fire Protection System"

- BVS-0435, Rev. 0, Add. 1, "Hot Water - Chilled Water and Interior Fire Lines"

- 8700-RM-0433-002, Rev. 19, "Valve Oper No Diagram Fire Protection Water"

- 1/2-PIP-M14, Rev. 10, "Pipe Classes For Use On BV-1 And BV-2"

- 10080-RB-0091B, Sht. 2, Rev. 13, "Flow Diagram Fire Protection"

- 10080-RM-0433-001A, Rev. 22, "Valve Oper No Diagram Fire Prot Wtr-Distribution Network"

**Supporting EEEEs**

- No Evaluations

- 1-2-PIPS-M17.3, Rev. 1, "FIRE PROTECTION SYSTEM PIPING INSTALLATION"

- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 10080-RB-0091C, Sht. 3, Rev. 17, "Flow Diagram Fire Protection"

- 10080-RB-0091G, Sht. 7, Rev. 19, "Flow Diagram Fire Protection"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Submit for NRC Approval

**3.5.14**

All fire protection water supply and fire suppression system control valves shall be under a periodic inspection program and shall be supervised by one of the following methods.

3.5.14(a)

Electrical supervision with audible and visual signals in the main control room or other suitable constantly attended location.

3.5.14(b)

Locking valves in their normal position. Keys shall be made available only to authorized personnel.

3.5.14(c)

Sealing valves in their normal positions. This option shall be utilized only where valves are located within fenced areas or under the direct control of the owner/operator.

**Compliance Basis:**

Complies

All fire protection water supply and fire suppression system control valves are under a periodic inspection program and are supervised by option 3.5.14(a) or (c).

Submit for NRC Approval

The only exceptions to monitoring by one of these two methods are the underground control valves supplying each outdoor fire hydrant which are used for maintenance only. These curb box type valves are inspected monthly to confirm that they are in the required open position, but are not monitored by one of the three methods identified in NFPA 805. See LAR Attachment L.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 10ST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"

- 20ST-33.1, Rev. 21, "Fire Protection System Valve Inspection Test"

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

**Beaver Valley Power Station**  
**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies by Previous NRC Approval
- Complies with Clarification

**3.5.15**

Hydrants shall be installed approximately every 250 ft (76 m) apart on the yard main system. A hose house equipped with hose and combination nozzle and other auxiliary equipment specified in NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances, shall be provided at intervals of not more than 1000 ft (305 m) along the yard main system.

Exception: Mobile means of providing hose and associated equipment, such as hose carts or trucks, shall be permitted in lieu of hose houses. Where provided, such mobile equipment shall be equivalent to the equipment supplied by three hose houses.

**Compliance Basis:**

Complies

Hydrants for Unit 1 and 2 are installed approximately every 250 ft (76 m) apart on the yard main system except for Unit 1 hydrant 10 and Unit 2 hydrants 15 and 16.

Complies with Clarification

The distance from yard fire hydrant 10 to the Intake Structure exceeds the allowable distance. It is estimated that fire hydrant number 10 is approximately 350 feet away. The interval between hydrants 15 and 16 on the south side of the Unit 2 Turbine Building exceed the 250 ft distance. Fire hydrant 16, located at the southwest corner of the Turbine Building, was relocated thus providing 370 foot spacing between hydrants 15 and 16.

Hose reel cabinets contain 3 sections x 50 feet of hose. This, in addition to the 200 feet of hose available to the Fire Brigade, will provide approximately 350 feet of hose. This arrangement meets the intent of NFPA 24 requirement that there shall be sufficient hydrants to concentrate the required fire flow about any important building with no hose line exceeding 500 feet in length. Hose houses are equipped with hose and combination nozzle and other auxiliary equipment that is considered to meet the intent of NFPA 24.

Complies by Previous NRC Approval

Fire hydrant 16, located at the southwest corner of the Turbine Building, was relocated, thus providing a 370 foot spacing. Coverage for nearby hazards appeared adequate and considered an acceptable deviation per the Unit 2 SER.

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Licensing Actions**

- BV2-18 Fire Hydrant - Deviation in Spacing - BTP C.6.b(7)

**References**

- NFPA Standard 24, Rev. 1970, "Outside Protection"
- 10080-RB-0002A, Sht. 1, Rev. 13, "Yard Piping Underground"
- 82-06-30-1, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12"
- 8700-RB-3B, Rev. 16, "Water and Fire Protection Lines"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 2OST-33.1, Rev. 21, "Fire Protection System Valve Inspection Test"

**Supporting EEEs**

- No Evaluations

- 10080-RB-0002C, Rev. 6, "Vent & A/C Secondary Plant"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- 2BVS-912, Rev. 4, "Specification for Yard Sewers, Fire and Domestic Water Systems"
- 87-05-05, "BV2 SSER "
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"

**Open Items and VFDRs**

- None

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

**Beaver Valley Power Station**

**3.5 Water Supply**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies with Clarification

**3.5.16**

The fire protection water supply system shall be dedicated for fire protection use only.

Exception No. 1 : Fire protection water supply systems shall be permitted to be used to provide backup to nuclear safety systems, provided the fire protection water supply systems are designed and maintained to deliver the combined fire and nuclear safety flow demands for the duration specified by the applicable analysis.

Exception No. 2: Fire protection water storage can be provided by plant systems serving other functions, provided the storage has a dedicated capacity capable of providing the maximum fire protection demand for the specified duration as determined in this section.

**Compliance Basis:**

The station fire protection procedure states that "Station personnel SHALL NOT use permanent and installed portable fire protection equipment for purposes other than fire protection without the approval of the Plant Manager, Site Fire Marshal AND the Fire Protection System Engineer" and require an assessment of the impact on plant safety and the ability to achieve safe shutdown in the event of a fire.

In addition, NFPA 805 Section 2.3 Assumptions (2): "No abnormal system transients, behavior, or design basis accidents precede the onset of the fire, nor do any of these events, which are not a direct consequence of fire damage, occur during or following the fire." Therefore, since the diesel fire pump water supply cross connect is not credited in the fire PRA, there is no need to determine combined flow requirements for the use of the fire protection system (FPS) water and for supply to the AFW emergency during a fire event.

**Licensing Actions**

- None

**References**

- IOM-33.4.L, Rev. 2, "Cross Connecting to River Water"
- UFSAR, Rev. 26, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

**Open Items and VFDRs**

-None

**Supporting EEEEs**

- No Evaluations

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

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

**Beaver Valley Power Station**  
**3.6 Standpipe and Hose Stations**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

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

**3.6.1**

For all power block buildings, Class III standpipe and hose systems shall be installed in accordance with NFPA 14, "Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems".

**Compliance Basis:**

Complies by Prior Approval

Unit 1 and Unit 2 standpipe and hose systems are equivalent to NFPA 14 Class II systems, which have 1-1/2 inch hose connections, in lieu of the required Class III system, which has both 1-1/2 inch and 2-1/2 inch hose connections. This was previously approved by the NRC specifying hose sizes.

Complies with Clarification

The interior standpipe and hose systems for Units 1 and 2 were evaluated for compliance with NFPA 14. The code review was conducted for Class II standpipes because this design was approved by the NRC specifying hose size. This code review identified several issues that are not in compliance with NFPA 14. Among these issues, non-compliances were justified based on analysis of plant conditions, procedures, and licensing documents; because of the increased controls in a nuclear plant as compared to commercial buildings, and that only trained fire brigade members will be using the hoses. Other non-compliances are provided with recommended actions to establish compliance.

Complies with use of EEEE

An evaluation was performed to allow more than 100 ft of hose at 3 hose stations. The evaluation allows the addition of 50 ft to fire hose in the Service Building and in two locations of the Safeguards Building for a hose lengths of 150 ft. This evaluation will be updated upon completion of plant hydraulic calculations.

Will Comply with Use of Commitment

The EEEE mentioned above will be updated upon completion of plant hydraulic calculations and the NFPA 14 requirement for pressure and flow at the topmost outlet of each standpipe will be verified upon completion of plant hydraulic calculations.

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

**Beaver Valley Power Station**  
**3.6 Standpipe and Hose Stations**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Licensing Actions**

- BV2-29 Standpipe and Hose Systems
- Class II versus Class III Requirement
- BTP C.6.c

**References**

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- 2DBD-33B, Rev. 10, "Fire Protection System"

**Open Items and VFDRs**

**Supporting EEEs**

- FPPCE 08-001 Rev.0
- 87-05-05, "BV2 SSER "
- 1DBD-33B, Rev. 14, "Fire Protection System"

<b>Item Number</b>	BV1-2833	<b>Item Title:</b> Hydraulic Calculations - Water Supply
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.6 Standpipe and Hose Stations**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies with Clarification
- Will Comply with the Use of Commitment

**3.6.2**

A capability shall be provided to ensure an adequate water flow rate and nozzle pressure for all hose stations. This capability includes the provision of hose station pressure reducers where necessary for the safety of plant industrial fire brigade members and off-site fire department personnel.

**Compliance Basis:**

Complies with Clarification

Pressure reducers are not provided at hose stations for both Units 1 and 2, even though the available pressure can exceed 100 psi at some hose stations. The fire brigade members are trained and drilled using the expected pressures available at Beaver Valley and thus the existing installation is considered adequate.

Will Comply with Use of Commitment

The capability to ensure an adequate water flow rate and nozzle pressure for all hose stations will be verified upon completion of hydraulic calculations.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2 ADM-1336, Rev. 3, "Fire Protection Training"  
- 211-B-41A, Rev. 0, "Auxiliary Building FP Sizing Piping and Hose Racks"

- 1/2-ADM-1902, Rev. 10, "Fire Brigade"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2833	<b>Item Title:</b> Hydraulic Calculations - Water Supply
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**  
**3.6 Standpipe and Hose Stations**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Will Comply with the Use of Commitment

**3.6.3**

The proper type of hose nozzle to be supplied to each power block area shall be based on the area fire hazards. The usual combination spray/straight stream nozzle shall not be used in areas where the straight stream can cause unacceptable damage or present an electrical hazard to fire-fighting personnel. Listed electrically safe fixed fog nozzles shall be provided at locations where high-voltage shock hazards exist. All hose nozzles shall have shutoff capability and be able to control water flow from full open to full closed.

**Compliance Basis:**

Unit 1

Will Comply with the Use of Commitment

Locations with high-voltage shock hazards within the Service Building do not have fixed fog nozzles installed. LAR Att. S includes a commitment for plant modification to replace the current nozzles with fixed fog nozzles.

Unit 2

Complies

Locations with high voltage shock hazards have fixed fog nozzles, and are identified by plant procedure.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 2OST-33.2A, Rev. 8, "Fire Protection Sstem Monthly Hose Stations Test"

- 1OST-33.2A, Rev. 6, "Fire Protection System Monthly Hose Stations Test"

**Open Items and VFDRs**

**Item Number**

BV1-3016

**Item Title:** Hose nozzles in high-voltage electrical areas

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

**Beaver Valley Power Station**  
**3.6 Standpipe and Hose Stations**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies with Clarification

**3.6.4**

Provisions shall be made to supply water at least to standpipes and hose stations for manual fire suppression in all areas containing systems and components needed to perform the nuclear safety functions in the event of a safe shutdown earthquake (SSE).

Exception: For existing plants that are not capable of meeting this requirement, provisions to restore a water supply and distribution system for manual firefighting purposes shall be made. This provisional manual fire-fighting standpipe/hose station system shall be capable of providing manual fire-fighting protection to the various plant locations important to supporting and maintaining the nuclear safety function. The provisions for establishing this provisional system shall be preplanned and be capable of being implemented in a timely manner following an SSE.

Note: This exception is not endorsed by the NRC. See 10CFR50.48(c)(2)(v)

**Compliance Basis:**

Unit 1 – Complies with Clarification

BV1 header installation specification did not require at the time of construction standpipes to be designed to remain functional after a seismic event. BV1 complies with the intent of NFPA 805, section 3.6.4 by having the ability to isolate piping sections and provide for the ability to pressurize the system by reversing flow through a fire hydrant from a portable pump (i.e. fire truck) using plant procedures.

Unit 2 - Complies

Piping and fittings of all internal piping in safety-related areas is in compliance with the requirements of ANSI B31.1, Power Piping and is seismically-analyzed and seismically supported for SSE.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations



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

**Beaver Valley Power Station**  
**3.6 Standpipe and Hose Stations**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**References**

- 2BVS-0914, Rev. 4, "Specification for Interior Fire Protection System"
- BVS-0435, Rev. 0, Add. 1, "Hot Water - Chilled Water and Interior Fire Lines"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 10080-RB-0091B, Sht. 2, Rev. 13, "Flow Diagram Fire Protection"
- 10080-RB-0091G, Sht. 7, Rev. 19, "Flow Diagram Fire Protection"
- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"
- 8700-RM-0433-002, Rev. 19, "Valve Oper No Diagram Fire Protection Water"
- 10080-RB-0091C, Sht. 3, Rev. 17, "Flow Diagram Fire Protection"
- 1OM-33.4.S, Rev. 4, "Portable Fire Pump Operating While 1FP-P-1 and/or 2 are O.O.S"
- 10080-RM-0433-001A, Rev. 22, "Valve Oper No Diagram Fire Prot Wtr-Distribution Network"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.6 Standpipe and Hose Stations**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.6.5**

Where the seismic required hose stations are cross-connected to essential seismic non-fire protection water supply systems, the fire flow shall not degrade the essential water system requirement.

**Compliance Basis:**

The fire protection systems will not degrade the essential water system requirement of the essential non-fire protection water supply systems.

**Licensing Actions**

- None

**References**

- 8700-RM-0433-002, Rev. 19, "Valve Oper No Diagram Fire Protection Water"
- 1DBD-30, Rev. 17, "River Water, Auxiliary River Water, and Raw Water Systems"
- 8700-RM-0433-001, Rev. 20, "Valve Oper No Diagram Fire Protection Water"
- 10080-RB-0091G, Sht. 7, Rev. 19, "Flow Diagram Fire Protection"

**Supporting EEEEs**

- No Evaluations

- 2DBD-30, Rev. 17, "Service Water System"
- 1/2OM-53C.4A.75.3, Rev. 16, "Acts of Nature - Earthquake"
- 10080-RM-0047D, Rev. 67, "Flow Diagram - Circulating and Service Water Piping SH 4"
- 10080-RM-0433-001A, Rev. 22, "Valve Oper No Diagram Fire Prot Wtr-Distribution Network"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.7 Fire Extinguishers**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies with Clarification
- Will Comply with the Use of Commitment

**3.7**

Where provided, fire extinguishers of the appropriate number, size, and type shall be provided in accordance with NFPA 10, Standard for Portable Fire Extinguishers. Extinguishers shall be permitted to be positioned outside of fire areas due to radiological conditions.

**Compliance Basis:**

Complies

The fire extinguishers at Beaver Valley Units 1 and 2 are periodically inspected by procedures.

Complies with Clarification

The fire extinguishers at Beaver Valley Units 1 and 2 were evaluated for compliance with NFPA 10-1981 requirements regarding type, spacing, and location. [ref. ARS-BV3-12-141, Rev. 1, "Fire Extinguisher Evaluation."] The fire extinguishers either comply, or comply with the intent of these requirements by clarification in the following areas: B:C extinguishers are provided in plant areas that also contain small amounts of ordinary combustibles, but these are acceptable because they are less corrosive than A:B:C dry chemical extinguishers; some plant areas contain additional extinguishers; the normally unoccupied Unit 1 Cable Spreading Mezzanine is not provided with extinguishers, but instead has hose racks located at each entrance to provide sufficient reach to the area; in the Unit 2 Fuel Building on elevation 735' there are a few small ignition sources exceeding the 75' travel distance, but are outside normal travel paths. Areas of non-compliance are provided with actions required to achieve compliance.

Will Comply with the Use of Commitment

The Unit 2 Waste Handling Building requires an extinguisher rated for electrical hazards, and the ERF Substation Emergency Diesel Generator Building extinguishers need to be replaced with larger extinguishers. These are required actions for compliance with NFPA 10 requirements for spacing, type, and location.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

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

**Beaver Valley Power Station**

**3.7 Fire Extinguishers**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**References**

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"

- 2OST-33.15A, Rev. 8, "Fire Extinguisher Inspection"

- 1/2PMP-33FP-FIRE EXT-1M, Rev. 8, "Maintenance of Portable Fire Extinguishers"

- ARS-BV3-12-141, Rev. 1, "Fire Extinguisher Evaluation"
- 85/10, "BV 2 UFSAR SER"

- 1OST-33.15A, Rev. 19, "Fire Extinguisher Monthly Inspection"

- 1OST-33.15C, Rev. 3, "Outbuilding Fire Extinguisher Inspection"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-3017	<b>Item Title:</b> Modify Portable Fire Extinguisher Installations
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

**Beaver Valley Power Station**

**3.8 Fire Alarm and Detection Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies by Previous NRC Approval
- Complies with Clarification

**3.8.1**

Fire Alarm. Alarm initiating devices shall be installed in accordance with NFPA 72, National Fire Alarm Code. Alarm annunciation shall allow the proprietary alarm system to transmit fire-related alarms, supervisory signals, and trouble signals to the control room or other constantly attended location from which required notifications and response can be initiated. Personnel assigned to the proprietary alarm station shall be permitted to have other duties. The following fire-related signals shall be transmitted:

- (1) Actuation of any fire detection device
- (2) Actuation of any fixed fire suppression system
- (3) Actuation of any manual fire alarm station
- (4) Starting of any fire pump
- (5) Actuation of any fire protection supervisory device
- (6) Indication of alarm system trouble condition

**Compliance Basis:**

Unit 1 & Unit 2 - Complies

Activation of all fire detection, automatic suppression, manual pull stations, fire pumps, fire protection supervisory devices, and alarm system trouble conditions send a signal to the control room.

Unit 1 - Complies with Clarification

The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a diesel generator. There is no 4 hour secondary battery supply. The switchover capability is an automatic function. The diesel generator supplies the 120-V ac uninterruptible power supply system required for the detection system and the 125-V dc panels for the fire detection and suppression systems. The primary and secondary power supplies are considered highly reliable and diverse. This arrangement is similar to the power supply circuits for BVPS-2 in which the NRC concluded in the BV2 SER that the primary and secondary source of power meets Section C.6.a of BTP CMEB 9.5-1 and is acceptable.

Unit 2 - Complies by Previous NRC Approval

The Unit 2 fire detection power supply system was previously approved in the BV2 SER (NUREG 1057) to be compliant with NFPA 72D for a Class A system with detectors installed in accordance with NFPA 72E.

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

**Beaver Valley Power Station**  
**3.8 Fire Alarm and Detection Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Licensing Actions**

- BV2-26 Fire Detection System  
Secondary Power Supplies - Use of  
Plant Emergency Power Supply - BTP  
C.6.a(6)

**References**

- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"  
- 2DBD-33B, Rev. 10, "Fire Protection System"  
- 84-05-23 SER, "BVPS-2 Fire Protection - Draft SER"

**Open Items and VFDRs**

-None

**Supporting EEEs**

- No Evaluations

- 1OM-33.1.E, Rev. 11, "Specific Instrumentation & Controls"  
- 2OM-33.1.E, Rev. 10, "Specific Instrument and Control"  
- 1DBD-33B, Rev. 14, "Fire Protection System"

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

**Beaver Valley Power Station**  
**3.8 Fire Alarm and Detection Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.8.1.1**

Means shall be provided to allow a person observing a fire at any location in the plant to quickly and reliably communicate to the control room or other suitably attended location.

**Compliance Basis:**

Procedure states that the communications systems (page party system and telephones) provide reliable, effective communications during normal operating and emergency conditions between essential areas to communicate a fire to the Control Room.

**Licensing Actions**

- None

**Supporting EEEEs**

- No Evaluations

**References**

- 1/2-EPP-IP-1.2, Rev. 28, "Communications and Dissemination of Information"

- FEN-PAT, Rev. 9, "Plant Access Training"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.8 Fire Alarm and Detection Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies

**3.8.1.2**

Means shall be provided to promptly notify the following of any fire emergency in such a way as to allow them to determine an appropriate course of action:

- (1) General site population in all occupied areas
- (2) Members of the industrial fire brigade and other groups supporting fire emergency response.
- (3) Off-site fire emergency response agencies. Two independent means shall be available (e.g., telephone and radio) for notification of off-site emergency services.

**Compliance Basis:**

- (1) Plant Access Training establishes guidelines to notify the general site population in all occupied areas by activating the Station Fire Alarm, to announce the location of the fire to warn all personnel, and to have all personnel follow the directions given over the GAI-Tronics (Party Page) System.
- (2) The Fire Brigade and supporting groups are notified of a fire by Control Room personnel sounding the Standby Alarm and announcing that a fire exists.
- (3) Off-Site fire emergency response agencies can be notified of a fire by the commercial telephone land line, the PAX system, the Emergency Telecommunications System, satellite phones, and the industrial radio system. These multiple systems and redundancies ensure the performance of vital functions in transmitting and receiving information throughout the course of the emergency.

**Licensing Actions**

- None

**References**

- 1/2OM-56B.4A.B, Rev. 6, "Fire Brigade and Fire Fighting Procedure"
- FEN-PAT, Rev. 9, "Plant Access Training"

**Supporting EEEEs**

- No Evaluations

- 1/2-EPP-IP-1.2, Rev. 28, "Communications and Dissemination of Information"

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**  
**3.8 Fire Alarm and Detection Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.8.2**

If automatic fire detection is required to meet the performance or deterministic requirements of Chapter 4, then these devices shall be installed in accordance with NFPA 72, National Fire Alarm Code, and its applicable appendixes.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.9 Automatic and Manual Water-Based Fire  
Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.9.1**

If an automatic or manual water-based fire suppression system is required to meet the performance or deterministic requirements of Chapter 4, then the system shall be installed in accordance with the appropriate NFPA standards including the following:

- (1) NFPA 13, Standard for the Installation of Sprinkler Systems
- (2) NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection
- (3) NFPA 750, Standard on Water Mist Fire Protection Systems
- (4) NFPA 16, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.9 Automatic and Manual Water-Based Fire**  
**Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.9.2**

Each system shall be equipped with a water flow alarm.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:  
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.9 Automatic and Manual Water-Based Fire**  
**Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.9.3**

All alarms from fire suppression systems shall annunciate in the control room or other suitable constantly attended location.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.9 Automatic and Manual Water-Based Fire  
Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - Complies with Clarification

**3.9.4**

Diesel-driven fire pumps shall be protected by automatic sprinklers.

**Compliance Basis:**

Complies by Clarification

The 6-6-79 SER approved the absence of suppression for the Intake Structure (of which the diesel-driven fire pump cubicle is included) based on control of transient combustibles, addition of smoke detection devices, and sufficient fire barriers. See Attachment T for additional discussion.

**Licensing Actions**

- BV2-30 Intake Structure - Detection  
and Three-Hour Barriers versus  
Sprinklers

**Supporting EEEEs**

- No Evaluations

**References**

- 76-10-27, "BVPS-1 Compliance with APCSB 9.5-1"  
  
- 10ST-33.16C, Rev. 1, "Early Warning Smoke Det Instr Test Main Intake  
Structure"  
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A,  
DGP-1B, & DGP-7"

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to  
Ammendment No. 18 to Facility Operating License No DPR-66"  
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.9 Automatic and Manual Water-Based Fire**  
**Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.9.5**

Each system shall be equipped with an OS&Y gate valve or other approved shutoff valve.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.9 Automatic and Manual Water-Based Fire**  
**Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.9.6**

All valves controlling water-based fire suppression systems required to meet the performance or deterministic requirements of Chapter 4 shall be supervised as described in 3.5.14.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.1**

If an automatic total flooding and local application gaseous fire suppression system is required to meet the performance or deterministic requirements of Chapter 4, then the system shall be designed and installed in accordance with the following applicable NFPA codes:

- (1) NFPA 12, Standard on Carbon Dioxide Extinguishing Systems
- (2) NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems
- (3) NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**

**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.2**

Operation of gaseous fire suppression systems shall annunciate and alarm in the control room or other constantly attended location identified.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.3**

Ventilation system design shall take into account prevention from over-pressurization during agent injection, adequate sealing to prevent loss of agent, and confinement of radioactive contaminants.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.4**

In any area required to be protected by both primary and backup gaseous fire suppression systems, a single active failure or a crack in any pipe in the fire suppression system shall not impair both the primary and backup fire suppression capability.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.5**

Provisions for locally disarming automatic gaseous suppression systems shall be secured and under strict administrative control.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.6**

Total flooding carbon dioxide systems shall not be used in normally occupied areas.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.7**

Automatic total flooding carbon dioxide systems shall be equipped with an audible pre-discharge alarm and discharge delay sufficient to permit egress of personnel.  
The carbon dioxide system shall be provided with an odorizer.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:  
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.8**

Positive mechanical means shall be provided to lockout total flooding carbon dioxide systems during work in the protected space.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.9**

The possibility of secondary thermal shock (cooling) damage shall be considered during the design of any gaseous fire suppression system, but particularly with carbon dioxide.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None



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

**Beaver Valley Power Station**

**3.10 Gaseous Fire Suppression Systems**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.10.10**

Particular attention shall be given to corrosive characteristics of agent decomposition products on safety systems.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:** - N/A

**3.11**

Passive Fire Protection Features. This section shall be used to determine the design and installation requirements for passive protection features. Passive fire protection features include wall, ceiling, and floor assemblies, fire doors, fire dampers, and through fire barrier penetration seals. Passive fire protection features also include electrical raceway fire barrier systems (ERFBS) that are provided to protect cables and electrical components and equipment from the effects of fire.

**Compliance Basis:**

This is a general statement section with no specific requirements. Refer to the following NFPA subsections 3.11.1 through 3.11.5 for the specific requirements. Compliance for each of the subsections is evaluated for each compartment in the fire protection features section and/or in this Chapter 3 review.

**Licensing Actions**

- None

**Supporting EEEs**

- No Evaluations

**References**

- None

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies by Previous NRC Approval
- Complies with Clarification
- Complies with use of EEEE

**3.11.1**

Building Separation. Each major building within the power block shall be separated from the others by barriers having a designated fire resistance rating of 3 hours or by open space of at least 50 ft (15.2 m) or space that meets the requirements of NFPA 80A, Recommended Practice for Protection of Buildings from Exterior Fire Exposures.

Exception: Where a performance-based analysis determines the adequacy of building separation, the requirements of 3.11.1 shall not apply.

**Compliance Basis:**

Unit 2

Complies by Previous NRC Approval

From Supplement 5 of the SSER, "The method for sealing penetrations as identified in Amendment 14 to the FSAR is an acceptable deviation from Section C.5.a(3) of BTP CMEB 9.5-1 when installation difficulties do not allow for sealing at the barrier." Prior Approval is further described in the Attachment K records.

Unit 1 & 2

Complies

Buildings are designated as having a 3 hour fire rating or are spatially separated.

Complies with use of EEEE

Where there is a lack of a 3 hour fire barrier, Generic Letter 86-10 has been used to evaluate the barrier for equivalency or adequate for the hazard. EEEEs associated with a compartment to demonstrate building separation are identified in the compartment specific 3.11.2 records.

Complies with Clarification

Compliance with this subsection of NFPA 805 is also achieved by meeting the Exception that permits a performance-based analysis. The Fire Risk Evaluation process reviews those fire protection features, such as barriers that do not meet the 3 hour criteria, which credit performance-based analysis as a means of acceptability.

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

**Beaver Valley Power Station**  
**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Licensing Actions**

- BV2-03 Conduits Seals & Penetration  
Seals -Deviation in Internal Conduit  
Seals and Method for Sealing Ventilation  
Ductwork- BTP C.5.a(3)

**References**

- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"  
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

**Open Items and VFDRs**

-None

**Supporting EEEEs**

- 10080-DMC-3443 R0 A2  
- TER 008976 R0

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"  
- 2701.620-000-022, Rev. C, "NFPA 805 Fire PRA Task 5.11c Multi Compartment Fire Analysis"

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

**Beaver Valley Power Station**  
**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.11.2**

Fire barriers required by Chapter 4 shall include a specific fire resistance rating. Fire barriers shall be designed and installed to meet the specific fire resistance rating using assemblies qualified by fire tests. The qualification fire tests shall be in accordance with NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials, or ASTM E 119, Standard Test Methods for Fire Tests of Building Construction and Materials.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**

**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.11.3**

Penetrations in fire barriers shall be provided with listed fire-rated door assemblies or listed rated fire dampers having a fire resistance rating consistent with the designated fire resistance rating of the barrier as determined by the performance requirements established by Chapter 4. (See 3.11.3.4 for penetration seals for through penetration fire stops.) Passive fire protection devices such as doors and dampers shall conform with the following NFPA standards, as applicable:

- (1) NFPA 80, Standard for Fire Doors and Fire Windows
- (2) NFPA 90A, Standard for the Installation of Air-conditioning and Ventilating System
- (3) NFPA 101, Life Safety Code

Exception: Where fire area boundaries are not wall-to-wall, floor-to ceiling boundaries with all penetrations sealed to the fire rating required of the boundaries, a performance-based analysis shall be required to assess the adequacy of fire barrier forming the fire boundary to determine if the barrier will withstand the fire effects of the hazards in the area. Openings in fire barriers shall be permitted to be protected by other means as acceptable to the AHJ.

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEEs**

**References**

**Open Items and VFDRs**

-None

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

**Beaver Valley Power Station**  
**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Compliance Statement:**

- Complies
- Complies by Previous NRC Approval
- Complies with use of EEEE
- Will Comply with the Use of Commitment

**3.11.4**

Through Penetration Fire Stops. Through penetration fire stops for penetrations such as pipes, conduits, bus ducts, cables, wires, pneumatic tubes and ducts, and similar building service equipment that pass through fire barriers shall be protected as follows.

(a) The annular space between the penetrating item and the through opening in the fire barrier shall be filled with a qualified fire-resistive penetration seal assembly capable of maintaining the fire resistance of the fire barrier. The assembly shall be qualified by tests in accordance with a fire test protocol acceptable to the AHJ or be protected by a listed fire rated device for the specified fire resistive period.

(b) Conduits shall be provided with an internal fire seal that has an equivalent fire resistive rating to that of the fire barrier through opening fire stop and shall be permitted to be installed on either side of the barrier in a location that is as close to the barrier as possible.

Exception: Openings inside conduit 4 in. (10.2 cm) or less in diameter shall be sealed at the fire barrier with a fire rated internal seal unless the conduit extends greater than 5 ft (1.5 m) on each side of the fire barrier. In this case the conduit opening shall be provided with noncombustible material to prevent the passage of smoke and hot gases. The fill depth of the material packed to a depth of 2 in. (5.1 cm) shall constitute an acceptable smoke and hot gas seal in this application.

**Compliance Basis:**

Unit 1 & 2

Complies

Through penetration fire stops and internal conduit seals are installed by procedure. Seals are to meet the applicable requirements of the corresponding typical detail/tested configuration.

Complies with use of EEEE

Where penetration seals do not meet the typical designs, an evaluation is performed per the guidance in NRC Generic Letter 86-10 to demonstrate the acceptability of the barrier relative to the hazards of the area. EEEEs associated with a compartment to demonstrate an acceptable configuration are identified in the compartment specific 3.11.4 records.

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

**Beaver Valley Power Station**  
**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

Unit 1

Will Comply with Use of Commitment

The Penetration Seal Database is currently being developed. See Attachment S for more details.

Unit 2

Complies by Previous NRC Approval

The BV2 SER also states that 18 penetration conduit seals could not be sealed to meet the criteria of the SRP at the plane of the fire barrier. Seventeen of these seals have fire detection and suppression on both sides of the barrier. The remaining seal has fire detection on both sides and automatic suppression only on one side. As accepted by the NRC, the conduit greater than 4 inches were sealed at the first opening and fire wrapped back to the barrier. For seals less than 4 inches in diameter and less than 5 feet from the barrier, the NRC accepted sealing the first opening of the conduit with fire-seal material. Prior Approval is further described in the Attachment K records.

**Licensing Actions**

- BV2-03 Conduits Seals & Penetration  
Seals -Deviation in Internal Conduit  
Seals and Method for Sealing Ventilation  
Ductwork- BTP C.5.a(3)

**Supporting EEEEs**

- FPPCE 13-011 Rev.0  
- FPPCE 13-010 Rev.0  
- FPPCE 13-009 Rev.0  
- FPPCE 13-008 Rev.0  
- FPPCE 12-124 Rev.0  
- FPPCE 12-095 Rev.0  
- FPPCE 12-086 Rev.0  
- 10080-DEC-0188  
- 10080-DMC-0054 Rev.2 A4  
- 8700-DMC-2912 R0 A2



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

**Beaver Valley Power Station**  
**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**References**

- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"
- IEEE Std. 634-1978, Rev. 0, "Cable Penetration Fire Stop Qualification Test"
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0956, Rev. B, "Typicals EC-1, EC-2, EC-3, EC-4, EC-5, and EC-6"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Non-Fire Compartment Specific**  
**Transition Report**

Beaver Valley Power Station

**3.11 Passive Fire Protection Features**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**3.11.5**

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

Exception No. 1: When the temperatures inside the fire barrier system exceed the maximum temperature allowed by the acceptance criteria of Generic Letter 86-10, "Fire Endurance Acceptance Test Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Training Within the Same Fire Area," Supplement 1, functionality of the cable at these elevated temperatures shall be demonstrated. Qualification demonstration of these cables shall be performed in accordance with the electrical testing requirements of Generic Letter 86-10, Supplement 1, Attachment 1, "Attachment Methods for Demonstrating Functionality of Cables Protected by Raceway Fire Barrier Systems During and After Fire Endurance Test Exposure."

Exception No. 2: ERFBS systems employed prior to the issuance of Generic Letter 86-10, Supplement 1, are acceptable providing that the system successfully met the limiting endpoint temperature requirements as specified by the AHJ at the time of acceptance."

**Compliance Basis:**

The assessment of this subsection is documented, as required, in a separate report titled:

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

**Licensing Actions**

**Supporting EEEs**

**References**

**Open Items and VFDRs**

-None

**Beaver Valley Power Station, Unit 1, Attachment A2 Records**

446 Pages Attached

## **Transition Report Attachment**

**Beaver Valley Unit 1**

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

Transition Report Section: - **Attachments**

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

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-CO-2

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

#### **Compliance Basis:**

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 3 hour fire rating. Barriers for this fire compartment area minimum of 24 inches of concrete on the 735'-6" elevation and a minimum of 12 inches of concrete on the 721'-6" elevation.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

#### References

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"  
- 8700-RC-0040C, Rev. 7, "Sects & Dets - Decay Tks Fuel Oil Tks Prim Water Stg Tks & Pump House Sh. 2"

- 8700-RC-0040A, Rev. 7, "Fdn. Plan & Sects- Decay Tks, Fuel Oil Tks, LI Prim Water Stg. Tks. & Pump House"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CO-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

Drawings identified two exterior doors to 1-CO-2. As exterior doors they are not required to be fire rated and are considered adequate for the hazard.

Fire Dampers:

Motor operated damper VS-D-44-1 on the 735'-6" elevation and VS-D-44-2 on the 721'-6" elevation with no fire ratings have been identified. As exterior dampers they are considered adequate for the hazard and do not require a fire rating.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 8700-RB-0008K, Rev. 9, "Htg & Vent Solid Waste Disposal & Miscellaneous Areas Sh. 10"
- 8700-RC-0040B, Rev. 9, "Sects & Decay Tks, Fuel Oil Tks, LI Prim Water Stg. Tks. & Pump House SH. 1"

- 8700-RC-0040A, Rev. 7, "Fdn. Plan & Sects- Decay Tks, Fuel Oil Tks, LI Prim Water Stg. Tks. & Pump House"
- 8700-RC-0040C, Rev. 7, "Sects & Dets - Decay Tks Fuel Oil Tks Prim Water Stg Tks & Pump House Sh. 2"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CO-2**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies

Penetrations in the west wall of 1-CO-2 have been visually inspected to confirm they have acceptable penetration seals between adjacent compartments.

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"  
- 8700-10.001-0711, Rev. B, "CO2 Storage EI 735'-6" PG Pump Room EI 721'-6" 3 HR Fire Rated Floors and Walls"  
- 8700-RC-0040A, Rev. 7, "Fdn. Plan & Sects- Decay Tks, Fuel Oil Tks, LI Prim Water Stg. Tks. & Pump House"  
- 8700-RC-0040C, Rev. 7, "Sects & Dets - Decay Tks Fuel Oil Tks Prim Water Stg Tks & Pump House Sh. 2"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"  
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"  
- 8700-RC-0040B, Rev. 9, "Sects & Decay Tks, Fuel Oil Tks, LI Prim Water Stg. Tks. & Pump House SH. 1"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CR-2**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

The Control Room HVAC Fire Area 1-CR-2 fire detection has area ionization coverage.

Complies

The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10 with the exception of item 3.

1. Confirmed detectors are mounted to the ceiling.
2. Confirmed there are no significant platforms in this fire compartment as described in the standard.
4. Confirmed the fire detectors are periodically tested by procedure.
5. The BVPS-1 control room intakes are not supplied with smoke detectors. If smoke is observed entering the control room from an external source, the operator can isolate the outdoor air intake valves. The operator would then manually align the system dampers to maximum recirculation by use of the manual-positioning switch in the air conditioning equipment room. Manual smoke venting of the control room area could then be accomplished, if required, by manually opening the outdoor air exhaust butterfly valves, closing the ductwork recirculation dampers, and running the return air fans only.
6. Confirmed there are no detectors used for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

Will Comply with the Use of Commitment

3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage for most of the area; however 1-CR-2 will require one additional detector and the relocation of D-32 closer to the ceiling in the HVAC area. This modification is included in Attachment S.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

FPPCE 12-124 Rev.0  
FPPCE 13-011 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"  
- 8700-RC-0008D, Rev. 11, "Slab Plan at El. 735'-6"-Reinf, Service Building"  
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"  
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"  
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"  
- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10ST-33.16F, Rev. 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room"  
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."  
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"  
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"  
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"  
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"  
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2840	<b>Item Title:</b> Add/move detectors to make them code compliant in BV1 CR-2
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CR-2**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies:

It was confirmed on drawings that the north and west walls and Stairwell S-4 are 12 inch thick concrete; the east wall and south wall and floor is 24 inch thick concrete; and ceiling are 5 1/2 and 8 inches thick concrete. The concrete floor is 36 inches thick. The equivalent fire resistance of these walls is greater than 3 hours, except for the ceiling of the pump room that has a fire resistance rating of 1 1/2 hours.

The fire barriers were confirmed to be periodically inspected for this fire area.

Complies by Previous Approval

NRC letter dated August 30, 1984 granted several exemptions for the 1 1/2-hour fire barrier floor that is the ceiling of the pump room section of 1-CR-2. The basis for the exemption included light combustible loading, alternate shutdown capability is provided independent of the fire area, and detection and manual suppression equipment is available. A clarification of compliance is provided to include the existing exemption, LA 11.17 (NRC letter dated August 30, 1984), for the floor of 1-CS-1 to the ceiling of the pump room in 1-CR-2.

Complies with Clarification:

PRA and MCA fire modeling analysis, has determined that the HVAC ductwork separating the 1-CR-2 and 3-CR-1 does not require a fire damper. Both a DFM and MCA were conducted for the Unit 1 section of the Main Control Room that took into account the effects of the Unit 2 section. A DFM was also performed for the Unit 2 section that took into account the effects of the Unit 1 section. These reports evaluated 3-CR-1 with no wall separating the two units and found it acceptable to have no wall between them.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

#### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-B-084, Rev. 12, Add. 1, "Fire Hazards Analysis"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735-6 Outline Service Bldg."
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### Open Items and VFDRs

<b>VFDR Number</b>	BV1-2719	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

#### **Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CR-2**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

There are 2 fire doors for this area. Drawings depict general door locations and their respective fire rating.

Fire door S13-4 is 3 hour fire rated.

Fire doors were confirmed to be inspected periodically by administrative procedures.

Fire Dampers:

Drawings identify ductwork and their associated fire dampers between CR-2 and the CR-4 and CS-1 areas. These dampers are 1VS-D-92A, 1VS-D-92B, 1VS-D-94A, 1VS-D-94B, 1VS-D-97A, 1VS-D-97B, 1VS-D-97C, 1VS-D-97D, and 1VS-D-119A.

All dampers for this area are identified as having 3-hour UL labels.

An administrative procedure and preventative maintenance tasks periodically perform inspections of fire dampers.

Complies by Clarification

The ventilation shaft between CR-2 and 3-CR-1 does not have a fire damper in it. This was evaluated as acceptable in the PRA and MCA analysis.

Complies by Previous Approval

Fire door S13-12 is 1 1/2 hour fire rated. The fire loading determined that a fire barrier of less than 1 1/2 hr is required. The existing walls, floor slab, ceiling, and doors exceed this required rating. The NRC letter dated August 30, 1984 was granted an exemption from the 3 hour fire rating requirement due to the low fire severity rating calculated for the area.

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

### **Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

### **Supporting EEEEs**

- None

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OM-54.3.TURBINE1, Rev. 36, "Turbine Log Readings"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RB-0017J, Sht. 9, Rev. 16, "Air Conditioning- Plan- Control Room- Service Bldg."
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0015, Rev. A, "Detail Fire Modeling Report - Fire Compartment 1-CR-2"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0017H, Rev. 10, "Vent & Air Cond El. 725'-6" Service Building Sh. 8"
- 8700-RB-0017K, Sht. 10, Rev. 15, "Air Conditioning- Sections- Control Room- Service BLDG."

### **Open Items and VFDRs**

<b>VFDR Number</b>	BV1-2719	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

#### **Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-CR-2

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

8700-DMC-2653 Eval.#15 R2 A0  
FPPCE 12-124 Rev.0  
FPPCE 13-011 Rev.0  
TER 009081 R0  
TER 11987 R0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0669, Rev. M, "Control Room EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0671, Rev. C, "Relay Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0673, Rev. C, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0668, Rev. H, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0670, Rev. K, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Wall"
- 8700-10.001-0672, Rev. E, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0674, Rev. D, "Process Rack Room EL. 713'-6" 3HR. Fire Rated Floor and Walls"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-0675, Rev. F, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0685, Rev. F, "P.A.B North Wall Data Sheet All Elevations"
- 8700-10.001-0722 , Rev. E, "Cable Tunnel EL. 720'-0" Data Sheet"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-10.001-0763, Rev. F, "HVAC Room El. 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0684, Rev. F, "PAB North Wall Penetrations All Elevations"
- 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"
- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"
- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

The Communication Equipment and Relay Panel Room (1-CR-3) detection consists of area coverage by ionization type detectors. The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10.

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage. Spacing is reduced because the ceiling has exposed beams.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEs**

FPPCE 12-124 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- FPPCE 13-008 Rev.0
- FPPCE 13-011 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RS-0005D, Rev. 10, "Mezzanine Floor Framing Service Building"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"
- 10ST-33.16F, Rev. 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064D, Sht. 4, Rev. 15, "Plan-Fire Alarm & Security Alarm System"
- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA 72D, Rev. 1973, "Proprietary Protective Signaling Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-3

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

Fire compartment barriers are 5.5 to 36 inches of reinforced concrete. Fire barriers are periodically inspected by procedure.

Complies by Previous Approval

NRC letter dated August 30, 1984 granted several exemptions for the 1 1/2-hour fire barrier floor of 1-CS-1 that is the ceiling of 1-CR-3. The basis for the exemption included light combustible loading, alternate shutdown capability is provided independent of the fire area, and detection and manual suppression equipment is available.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"  
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"  
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-CR-3

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

##### Fire Doors:

There are 2 fire doors for this area. Doors S13-2 and S13-3 between 1-CR-3 and 1-CR-4 are identified on the door schedule as 1.5-hour fire doors. NRC letter dated August 30, 1984 granted exemptions including one for 1-CR-3 from III.G.2, since the area is not enclosed by a 3-hour barrier due to the fire doors mentioned above and the construction of the ceiling. Justification for the exemption included the fact that the combustible loading in CR-3, if totally consumed, would correspond to an equivalent fire severity of approximately 50 minutes on the ASTM E-119 Standard Time-Temperature Curve. The justification also included the fact that smoke detection and manual fire suppression equipment are provided in the area, and alternate shutdown capability independent of the area is provided.

##### Fire Dampers:

The fire dampers for the 1-CR-3 area have the functional locations of 1VS-D-93, 1VS-D-95A, 1VS-D-95B, 1VS-D-96, 1VS-D-331, 1VS-D-332 and each have a UL 3 hour fire label.

##### Licensing Actions

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

- None

##### References

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-10-31, "BVPS-1 Special Report"
- 8700-10.001-0673, Rev. C, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"
- 8700-10.001-0746, Rev. A, "Zero Clearance Fire Damper Model #'s FD-100V/H, 200V/H, 400/V "
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0017H, Rev. 10, "Vent & Air Cond El. 725'-6" Service Building Sh. 8"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- EM 30318, "NRC Inspection #83-69: Fire Dampers"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OM-54.3.TURBINE1, Rev. 36, "Turbine Log Readings"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 8700-10.001-0671, Rev. C, "Relay Room El. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0675, Rev. F, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0722 , Rev. E, "Cable Tunnel EL. 720'-0" Data Sheet"
- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- EM 30494, "Inoperable Fire Barrier Between CR-3 and CR-4"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-3

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

FPPCE 12-124 Rev.0

FPPCE 13-008 Rev.0

FPPCE 13-011 Rev.0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0673, Rev. C, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"

- 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"

- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0671, Rev. C, "Relay Room EL. 713'-6 3HR Fire Rated Floor and Walls"

- 8700-10.001-0675, Rev. F, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"

- 8700-10.001-0722 , Rev. E, "Cable Tunnel EL. 720'-0" Data Sheet"

- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CR-4**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**       3.8.2 - Detection

**Compliance Basis:**

Complies

Fire Area 1-CR-4 detection consists of ceiling ionization detectors and under floor ionization smoke detection. The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10 with the exception of 3.

1. Confirmed the location of the smoke detectors. Out of the 12 ceiling smoke detectors 3 detectors are mounted to the underside of 14-inch deep steel beams, one detector is mounted to the bottom of a cable tray approximately 40 inches below the ceiling and one detector is mounted adjacent to a cable tray approximately 20 inches below the ceiling.
2. Confirmed the detection under the raised floor per NFPA 72E, paragraph 2-6.6 is also required.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Complies with Use of EEEE

3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage. The three detectors are mounted below beams and two detectors are mounted on or near cable trays are a non-compliance with NFPA 72E-1978; however, an engineering evaluation found this configuration to be adequate for the hazard.

Will Comply with the Use of Commitment

3. See Attachment S for details on the incipient fire detection modification.

#### Licensing Actions

- 11.10 Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA 72D, Rev. 1973, "Proprietary Protective Signaling Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### Supporting EEEs

- 8700-DMC-2840 Eval.#3 R0 A2
- FPPCE 12-122 Rev.0
- FPPCE 12-124 Rev.0

- 10ST-33.16F, Rev. 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room"
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RS-0005D, Rev. 10, "Mezzanine Floor Framing Service Building"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

#### Open Items and VFDRs

Item Number	Item Title:
BV1-1875	Add Incipient Fire Detection to 1-CR-4 Process Racks

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-CR-4

**Compliance Statement:** *Complies*

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.1 - NFPA Standards

#### **Compliance Basis:**

*Complies*

Fire compartment 1-CR-4 is a total flood Halon 1301 suppression system in the under-floor cable trench area only. NFPA 12A-1980 applies as the code of record. The under-floor cable trench area of fire area 1-CR-4 includes two separate Halon 1301 systems. The systems are designated as system 12A (in the south section) and system 12B (located in the north). The following critical attributes of the code were evaluated to ensure functionality and reliability;

Item 1 through 11 below;

1. The available quantity and flow calculations were confirmed to provide adequate concentration to meet NFPA 12A-1980.
2. The initial post installation tests were reviewed and confirmed that both Halon system provide acceptable levels of concentration.
3. The fire detection actuation devices in Zone 12A and 12B were confirmed to be spaced appropriately.
4. Each system was verified to be instrumented to indicate detection and actuation in the control room and it is tested periodically.
5. Each of the two Halon 1301 suppression systems was verified to have an emergency manual control station.
6. The Halon cylinder pressure and weights are inspected periodically months using procedure 1OST—33.22.
7. For both of the Halon systems, 12A and 12B all pipes and fittings were confirmed to be acceptable per NFPA 12A-1980. There is some flexible hose used at the storage cylinders and confirmed to be of approved materials and pressure ratings.
8. The sub-floor Halon 1301 suppression systems in CR-4 are tested in 1OST-33.23. This OST provides verification of manual, manual-electric, and automatic actuation and to verify the integrity of the header piping and discharge nozzles. Procedure 1OST-33.20 verifies Halon system valves and switches are in their required positions; all status lights indicate the proper system lineup/condition on a monthly frequency.
9. This is an under floor Halon system. There are no doors or dampers to actuate.
10. The Halon control panel was confirmed to have primary and secondary power supplies.
11. If the Halon system becomes inoperable, the administrative requirement is to establish the appropriate fire compensatory measures.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- None

**Supporting EEEs**

8700-DMC-2840 Eval.#3 R0 A2  
 FPPCE 11-023 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 1OST-33.2A, Rev. 6, "Fire Protection System Monthly Hose Stations Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RE-0001H, Rev. 23, "480V One Line Diagram"
- 8700-RE-0011F, Rev. 37, "120VAC Dist Pnl 7 through 13 SH2"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 1OM-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 1OST-33.22, Rev. 8, "Halon Storage Cylinder Operability Test for Cable Tunnel CV-3 and Process Equipment Area"
- 1OST-33.23A, Rev. 4, "Process Equipment Area and Cable Tunnel CV-3 Halon Instrumentation Test"
- 1PFP-SRVB-713-Process, Rev. 2, "Process Rack Room Fire Area CR-4"
- 8700-06.024-3748, Rev. 1, "Halon System Relay Pnl. and Process Instrm Rm."
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RE-0001D, Rev. 18, "480V One Line Diagram Sh. 1"
- 8700-RE-0009EW, Rev. 8, "480V MCC 1-11 Vent & Equip RM SH1"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- NFPA 72D-1975, Rev. 1975, "Proprietary Protective Signaling Systems"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-4

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

The fire suppression for the sub-floor of CR-4 is total flooding Halon 1301, consisting of two sub-systems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A).

The gaseous fire suppression systems are controlled by local control panels with a local alarm and that also alarms to the main control room.

**Licensing Actions**

- None

**References**

- "SFPE Handbook of Fire Protection Engineering, Second Edition"
- 10ST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"

**Supporting EEEEs**

- None

- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-CR-4

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

The sub-floor of Fire Area CR-4 is provided with a total flooding Halon 1301 extinguishing system, consisting of two sub-systems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A).

The bottom of these protected sub-floor areas are concrete, and the tops are floor panels, with cabinets extending above the floor panels. There are some openings around cables from the protected sub-floor space into the cabinets and this would provide more than enough venting area during the discharge. Since the Halon and air mixture in the sub-floor will then be considerably more dense than the air in the room above, the continued loss rate to the above room area would not be significantly high.

This compartment is not located in the radiologically controlled area so it is not necessary to consider confinement of radioactive contaminants.

**Licensing Actions**

- None

**References**

- "SFPE Handbook of Fire Protection Engineering, Second Edition"
- 10ST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"

**Supporting EEEEs**

- None

- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713'-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"
- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-CR-4

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

The sub-floor of Fire Area CR-4 is provided with a total flooding Halon 1301 extinguishing system, for the cable trench area in the sub-floor and does not have a backup gaseous suppression system. Backup fire suppression is provided by fire hose stations and extinguishers. The two Halon suppression sub-systems each have a reserve supply cylinder but this is not required to be single failure proof because it does not represent the backup capability for the area.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- "SFPE Handbook of Fire Protection Engineering, Second Edition"  
- 10ST-33.15A, Rev. 19, "Fire Extinguisher Monthly Inspection"  
- 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No DPR-66"  
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "  
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"  
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"  
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"  
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713-6"  
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"  
- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"

- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
- 10ST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"  
- 10ST-33.2A, Rev. 6, "Fire Protection System Monthly Hose Stations Test"  
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"  
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"  
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"  
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"  
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"  
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"  
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"  
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-CR-4

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

#### **Compliance Basis:**

The fire suppression for the sub-floor of CR-4 are two total flooding Halon 1301 systems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A). Access to the sub-floor area is accomplished by lifting up the floor tiles. This confined space sub-floor area is not sized for normal human occupancy, and is just for running and accessing cables, no special or simple means for disarming, such as lockout switches, were provided for these two Halon systems. During maintenance work when the sub-floor access panels are removed, and during periodic system testing, the pilot hoses to the discharge head valves on the Halon storage cylinders can be disconnected to prevent any automatic discharge of Halon, and this is controlled by plant procedures. The systems are inspected monthly to confirm they are in the ready condition.

#### Licensing Actions

- None

#### References

- 1OM-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"

#### Supporting EEEs

- None

- 1OST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-4

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

The fire suppression for the sub-floor of CR-4 is a total flooding Halon 1301 system, consisting of two sub-systems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A). This area is not for normal human occupancy, and is just for running and accessing cables. The height of the raised floor is between 6 and 7 1/2 inches from the concrete floor. The Halon discharge concentration levels from the calculations are: for subsystem 12A is approximately 6.82 to 6.87% and for 12B is 16.67%. Even if the Halon gas were to leak into the room above the sub-floor, it would only result in a very low concentration of Halon due to the larger floor area and volume and still results in less than the 10 percent NFPA 12A requirement. Therefore the subject Halon 1301 system does not represent a personnel concern or cause an immediate threat-to-life concern.

**Licensing Actions**

- None

**References**

- "SFPE Handbook of Fire Protection Engineering, Second Edition"
- 10ST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"

**Supporting EEEs**

- None

- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-4

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

The fire suppression for the sub-floor of CR-4 is a total flooding Halon 1301 system, consisting of two subsystems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A). There is an approximate 20-second discharge delay with audible pre-discharge alarms for each Halon subsystem for any personnel to exit the area or vicinity of the sub-floor. Due to the sub-floor configuration preventing human occupancy per NFPA 12A-1980, the 20 second delay is acceptable.

**Licensing Actions**

- None

**References**

- "SFPE Handbook of Fire Protection Engineering, Second Edition"
- 10ST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"
- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"

**Supporting EEEs**

- None

- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond EI. 713'-6" Service Building"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-CR-4

**Compliance Statement:** Complies with Clarification

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

#### **Compliance Basis:**

The fire suppression for the sub-floor of CR-4 is a total flooding Halon 1301 system, consisting of two subsystems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A). There is no special or simple means for locking out these two Halon subsystems except to close the discharge valves on the Halon storage cylinders to prevent any discharge of Halon. Since these low concentration Halon systems only protect a very shallow space below the floor it is not specifically required to have a lockout provision as if it were a CO2 system.

#### Licensing Actions

- None

#### References

- "SFPE Handbook of Fire Protection Engineering, Second Edition"
- 10ST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70""
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713'-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"
- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"

#### Supporting EEEs

- None

- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-4

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The fire suppression for the sub-floor of CR-4 is a total flooding Halon 1301 system, consisting of two subsystems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A). NFPA 12A-1980 states that the liquid phase vaporizes rapidly when mixed with air and thus limits the hazard to the immediate vicinity of the discharge point. The SFPE Handbook of Fire Protection Engineering, states that "Since it is virtually free of electrical conductivity, Halon 1301 is highly suitable for electrical fires." The discharge nozzles for the subject Halon systems are located in the sub-floor of CR-4, and this would minimize any impingement or thermal effects on equipment in the main part of the room.

**Licensing Actions**

- None

**References**

- "SFPE Handbook of Fire Protection Engineering, Second Edition"
- 10ST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"
- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"

**Supporting EEEEs**

- None

- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

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

- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CR-4

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

### **Compliance Basis:**

The sub-floor of Fire Area CR-4 is provided with a total flooding Halon 1301 extinguishing system, consisting of two subsystems, one for the process rack room sub-floor north (12B), and one for the process rack room sub-floor south (12A). The system is automatically actuated by the fire detectors. The Halon 1301 calculation time for the subsystem 12A discharge time for Halon 1301 is 7.3 seconds, and for the subsystem 12B is 8.3 seconds. There is an approximate 20-second discharge delay for each subsystem for any personnel to exit the area or vicinity of the sub-floor. The ionization detectors and heat actuated heat detectors would sense the fire condition in its early stages and the quick application will extinguish the fire and keep the Halon decomposition to a minimum since decomposition increases over 900°F.

### **Licensing Actions**

- None

### **References**

- "SFPE Handbook of Fire Protection Engineering, Second Edition"
- 1OST-33.20, Rev. 6, "Halon Fire Protection System Inspection Test"
- 1OST-33.23A, Rev. 4, "Process Equipment Area and Cable Tunnel CV-3 Halon Instrumentation Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0482, Rev. A, "Under Floor Cable Area CR-4-N Halon Extinguishment Control Panel"
- 8700-10.001-0504, Rev. A, "Halon Fire Prot Flow Calc for CR-4 Sub Floor Service Bldg"
- 8700-10.001-0522, Rev. A, "Under Floor Cable Area Halon Extinguishment Control Panel (CR-4)"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RE-0051L, Rev. 3, "Cond Plan - Fire Prot Sys (Halon)"

### **Supporting EEEs**

- None

- 1OM-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0498, Rev. A, "Service Bldg. 713'6" (CR-4) Below Raised Floor - Halon Series "70"
- 8700-10.001-0505, Rev. A, "Fire Protection System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-10.001-0546, Rev. A, "Fire System Flow Calculation for CR-4 Sub Floor Halon"
- 8700-RC-0008Z, Rev. 2, "Raised Floor System for Cable Trenches in Service Building - Elev. 713'-6"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RM-0544A-04, Rev. 7, "Flow Diagram, Control Room Area - Air Conditioning"
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Fire Compartment - 1-CR-4**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

Drawings show fire barriers in 1-CR-4 are 3 hour rated except for the ceiling. The ceiling is approximately 1.5 hours and is concrete on metal deck supported by steel beams with fireproofing.

The fire barriers are periodically inspected.

Complies by Prior Approval

NRC letter dated August 30, 1984 granted an exemption for 1-CR-4 from III.G.2 since the ceiling and fire doors do not provide a 3-hour barrier. Justification for the exemption included the fact that the combustible loading in 1-CR-4, if totally consumed, would correspond to an equivalent fire severity of approximately 45 minutes on the ASTM E-119 Standard Time-Temperature Curve, smoke detection and manual fire suppression equipment are provided in the area, and alternate shutdown capability independent of the area is provided. Based on that, the protection provided for 1-CR-4 provides a level of fire protection equivalent to the technical requirements of Section III.G, and the exemption was granted. The exemption for the lack of three hour fire barriers included a fire severity of 45 minutes. The current fire severity is greater than 45 minutes, but less than 1.5 hours. See Attachment T for a discussion on this prior approval.

**Licensing Actions**

- 11.10 Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Supporting EEEs**

- None

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0008G, Sht. 2, Rev. 10, "Sections Service Building"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Fire Compartment - 1-CR-4**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

Complies

Drawings depict general door locations and their respective fire rating. Fire doors are either 3 hr or 1.5 hr rated.

Fire doors are inspected periodically by administrative procedures and preventative maintenance tasks.

Complies by Prior Approval

NRC letter dated December 4, 1986 concluded that the fire door assemblies, combined with the licensee's modifications, provided an acceptable level of protection in accordance with the guidelines of Section D.1 (j) of Appendix A to BTP APCSB 9.5-1.

Fire Dampers:

Complies

Drawings identify ductwork and their associated fire dampers for the 1-CR-4 area. These dampers are 1VS-D-91A, 1VS-D-91B, 1VS-D-97A, 1VS-D-97B, 1VS-D-97C, 1VS-D-97D, 1VS-D-105, 1VS-D-119A, 1VS-D-331, and 1VS-D-332.

Fire dampers are inspected periodically by administrative procedures and preventative maintenance tasks.

Complies by Clarification

Ventilation damper 1VS-D-119A, penetration between 1-CR-4 and 1-CS-1 does not have a fire damper, but is fire wrapped with 3-hour material.

Complies with use of EEEE

FPPCE 11-023 evaluates damper 1VS-D-105 separating 1-NS-1 Normal Switchgear Room from 1-CR-4 Process Rack Room, with 1½ hour rated fire damper as

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acceptable.

**Licensing Actions**

- 11.10 Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RB-0017J, Sht. 9, Rev. 16, "Air Conditioning- Plan- Control Room- Service Bldg."
- DCP-0589, "Install Access Panels in Duct"
- EM 30448, "QA Audit BV-1-84-36; Fire Barrier Finding"
- EM 30494, "Inoperable Fire Barrier Between CR-3 and CR-4"

**Supporting EEEEs**

FPPCE 11-023 Rev.0

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 85-10-31, "BVPS-1 Special Report"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0017H, Rev. 10, "Vent & Air Cond El. 725'-6" Service Building Sh. 8"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- EM 30318, "NRC Inspection #83-69: Fire Dampers"
- EM 30473, "NRC Violation on CR-4/CS-1 Duct W/O Fire Barrier"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Fire Compartment - 1-CR-4**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized. A penetration seal is to be modified.

**Licensing Actions**

- 11.10 Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- 8700-DMC-2840 Eval. #2 R0 A0
- 8700-DMC-2840 Eval.#3 R0 A2
- FPPCE 12-124 Rev.0
- TER 11797 R0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0674, Rev. D, "Process Rack Room EL. 713'-6" 3HR. Fire Rated Floor and Walls"
- 8700-10.001-0676, Rev. E, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0673, Rev. C, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0675, Rev. F, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0680, Rev. E, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire Rated Floor and Walls"

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

- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"

- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

The Cable Spreading Room, 1-CS-1, is provided with area ionization detection. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Complies

Items 1 through 10 with the exception of item 3.

1. There are 16 smoke detectors located at the ceiling of the east area and 15 additional smoke detectors provided in the west area. Two of these fire detectors are mounted to the underside of a beam that runs north-south.
2. There are no significant platforms in the compartment as described in the standard.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Will Comply with the Use of a Commitment

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

### Fire Protection Features Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

3. Confirmed most of the smoke detection spacing does meet the allowable listed spacing recommendations of the manufacturer and NFPA code. There a a couple of smoke detectors that exceed the allowable listed spacing as modified for the type of ceiling coverage on several detectors. A modification will add smoke detectors and heat detectors in BVPS-1 cable spreading area. See LAR Attachment S for commitment to perform modification.

#### Licensing Actions

- None

#### Supporting EEEs

8700-DMC-2840 Eval.#1 R0 A2  
FPPCE 06-043 Rev.0  
FPPCE 12-025 Rev.0  
FPPCE 12-124 Rev.0  
FPPCE 13-008 Rev.0  
FPPCE 13-009 Rev.0

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735-6 Outline Service Bldg."
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- NFPA 72D, Rev. 1973, "Proprietary Protective Signaling Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16B, Rev. 2, "Early Warning Smoke Det. Instr. Test Diesel Gen. Rms Cable Vaults and Cable Mezzanine"
- 8700-RC-0008D, Rev. 11, "Slab Plan at El. 735'-6"-Reinf, Service Building"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064F, Sht. 2, Rev. 10, "W/D-FIRE ALARM & SECURITY ALARM SYSTEM "
- 8700-RE-0064JN, Rev. 1, "W/D PNL-CU-39 FP SYSTEM"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

#### Open Items and VFDRs

<b>Item Number</b>	BV1-2839	<b>Item Title:</b> Add smoke detectors and heat detectors in BVPS-1 cable spreading area, Fire Area CS-1
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**Fire Compartment - 1-CS-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The total flooding CO2 system was specified to conform to the requirements of NFPA No. 12-1973. Actuation is by temperature or initiated manually. A second actuation must be performed manually to maintain concentration. The following critical attributes of the consensus code were evaluated to ensure functionality and reliability;

Items 1 through 13 below with the exception of Items 1, 4, and 11.

2. A condition report documented that the tests conducted on 6/21/75 indicated greater than 50 percent CO2 concentration was achieved at all three sample levels with retention time for concentration at/or above 50 percent being held.

3. The review concluded there is an audible pre-discharge alarm and a 60-second time delay before discharge begins.

5. It was confirmed that for emergency manual control there is a break glass station that has a mechanical lever that can be moved which will utilize CO2 pressure to open the local valve and manually discharge CO2 to the area upon a loss of power to the main control cabinet. There is a similar break glass station located near the 10-ton CO2 tank that can be operated to open the master valve.

6. It was confirmed that the pressure and level of the 10-ton CO2 tank are recorded periodically.

7. The CO2 tank level and pressure alarms were confirmed to send alarm signals to the main control room.

8. A review of the purchase specification confirmed that all piping between the master and selector valves and open end piping is steel and conforms to ASTM A53, which is acceptable to the consensus code.

9. The administrative test procedure confirms that the actual pre-discharge time is acceptable, and that the manual actuation by a pushbutton completes the entire discharge cycle in the acceptable time frame.

10. The dampers are inspected to ensure that they trip when the CO2 discharge occurs and are also confirmed operable by a visual inspection. TER 10497 documented the removal of automatic closure chains and capping of pilot piping in the CO2 system for fire doors. The basis for the removal states that administratively, station personnel shall ensure that fire doors are kept closed, unblocked, or continuously guarded except when opened for passage into and out of

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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**Beaver Valley Unit 1**

an area.

12. The CO2 panels were confirmed to have primary and secondary power supplies.

13. Fire watches are initiated if the system becomes inoperable.

Complies with Use of EEEE

1. Calculations were confirmed to ensure adequate flow rate and design concentrations for suppression of the most limiting fire hazard.

11. A calculation concludes a peak pressure well within the allowable pressure for the room were achieved by opening fire damper 1VS-D-259 which created a pressure relief path.

Will Comply with Use of Commitment

4. A review of drawings concluded the installation of fire detection devices and that upon actuation will send a signal to annunciate an alarm to the main control room. Some devices were found to exceed the allowable code spacing requirements. See LAR Attachment S for modification to resolve spacing issue.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-2653 Eval. #11 R2 A1  
8700-DMC-2840 Eval.#1 R0 A2  
8700-DMC-2840 Eval.#3 R0 A2  
FPPCE 06-043 Rev.0  
FPPCE 11-024 Rev.0  
FPPCE 11-025 Rev.1  
FPPCE 11-026 Rev.0  
FPPCE 12-025 Rev.0  
FPPCE 12-124 Rev.0  
FPPCE 13-008 Rev.0  
FPPCE 13-009 Rev.0

**References**

- "Fire Protection Handbook, Sixteenth Edition"  
- 1OM-33.4.ABD, Rev. 0, "Cable Tray Mezz Fire Prot System Trouble"  
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 1OST-44A.10, Rev. 41, "Critical Equipment Ventilation Damper Alignment Check"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"  
- 1OST-33.9, Rev. 8, "CO2 Fire Protection System Inspection Test"  
- 1PFP-SRVB-725 , Rev. 2, "Cable Tray Mezz"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1445, Rev. 0, Add. 1, "CO2 Concentration Versus Time in the Unit 1 Cable Tray Mezzanine"
- 8700-RB-0017H, Rev. 10, "Vent & Air Cond El. 725'-6" Service Building Sh. 8"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"
- 8700-RE-0021MZ, Rev. 5, "Elementary Diagram Ventilation Sys (VS) Sh. 24 of 29 Switchgear Area "
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- ARS-BV1-10-009, Rev. 1, "Addendum to Calculation 8700-DMC-1445"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-3-1, Rev. 1, "Setpoint Document For TD-1FE-3-1"
- SPD-TD-1FE-3-3, Rev. 1, "Setpoint Document For TD-1FE-3-3"
- SPD-TD-1FE-3-5, Rev. 1, "Setpoint Document For TD-1FE-3-5"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-B-084, Rev. 12, Add. 1, "Fire Hazards Analysis"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-0017L, Rev. 11, "Vent & Air Cond. El. 725'-6" Service Building Sh. 11"
- 8700-RE-0001V, Rev. 31, "25V DC One Line Diagram"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- ECP 02-0514, Rev. 1, "Damper Modification for Fire Area CS-1"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-3-2, Rev. 1, "Setpoint Document For TD-1FE-3-2"
- SPD-TD-1FE-3-4, Rev. 1, "Setpoint Document For TD-1FE-3-4"
- SPD-TD-1FE-3-6, Rev. 1, "Setpoint Document For TD-1FE-3-6"
- TER 7895, Rev. 0, "Increase Pre-Discharge Alarm Period For Fire Protection System"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2839	<b>Item Title:</b> Add smoke detectors and heat detectors in BVPS-1 cable spreading area, Fire Area CS-1
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-CS-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.2 - Control room alarm

#### Compliance Basis:

The system for the 1-CS-1 is directly controlled by a local fire protection panel. A CO2 discharge, an area fire condition, and a system trouble condition will alarm to annunciators in the main control room.

#### Licensing Actions

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

- None

#### References

- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"  
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"  
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"

#### Open Items and VFDRs

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

Complies

Radiological considerations are negligible for 1-CS-1.

Complies with use of EEEE

The damper blades and fusible links of a damper were removed to relieve any over-pressurization concern.

The Unit 1 Cable Tray Mezzanine CO2 system can achieve and maintain >50% concentration everywhere in the room for an acceptable length of time (i.e., ten minutes following the second system discharge) by having a second system discharge per an engineering evaluation.

A CO2 discharge will trip the Switchgear Area Exhaust Supply Fans further reducing the loss rate of CO2 concentration.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-1445 R0 A2

**References**

- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"

- 8700-RE-0021MZ, Rev. 5, "Elementary Diagram Ventilation Sys (VS) Sh. 24 of 29 Switchgear Area "

- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"

- ECP 02-0514, Rev. 1, "Damper Modification for Fire Area CS-1"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

Fire Compartment 1-CS-1 is provided with a total flooding CO2 extinguishing system. Backup fire suppression is provided by fire hose stations and extinguishers.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

The Lock-Out switch station (LO-FE-3) is located just outside of the CO2 protected area in the Control Room Stairwell and upon lockout of the CO2 system to the abnormal position a main control room annunciator will alarm.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 1OM-33.4.ABD, Rev. 0, "Cable Tray Mezz Fire Prot System Trouble"  
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"  
  
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"  
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

**Supporting EEEs**

- None

- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"  
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

Access to 1-CS-1 is through a locked security door accessed by a card-reader from either the Service Building Northwest Stairwell (1-S-5) or from the Control Room Stairwell (1-S-4). It is located away from any interior transient path of the station, ensuring that entry to the area is only to perform a specific task in the area and for no other reason. This area is not normally occupied by personnel.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

The presence of an odorizer, an audible pre-discharge alarm in the form of a horn, and a 60-second time delay before the discharge begins are provided and periodically inspected by procedure.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- IOST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"  
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"

- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "  
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

Fire Compartment 1-CS-1 CO2 system has a local electrical lock-out switch only. It is common to use the electrical lock-out switch when a significant amount of work is being done in the area. Positive mechanical means to lock-out the subject carbon dioxide system can be accomplished by closing the CO2 supply tank discharge manual valve. However, this valve is not normally used for this purpose because it isolates the tank from all of the carbon dioxide systems supplied from the tank, resulting in all these systems becoming inoperable. This arrangement is not in compliance with NFPA 805. LAR Att. S tracks the plant commitment to make modification to provide positive mechanical means to lockout the total flooding carbon dioxide systems during work in automatic CO2 protected space.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

- 10ST-44A.10, Rev. 41, "Critical Equipment Ventilation Damper Alignment Check"

- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"

**Open Items and VFDRs**

**VFDR Number**

BV1-0746

CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805 section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:

NA

**Disposition**

This VFDR will be corrected by a plant modification.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CS-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

Typically, cable trays are located approximately 1-3 feet below the nozzles in 1-CS-1. The only other equipment in 1-CS-1 are four ventilation fans located on the floor; however, the nozzles are not in close proximity to the fans. Therefore, there is reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"

- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Carbon dioxide suppression systems are non-corrosive, non-damaging, and leave no residue to clean up after the fire, and it will not conduct electricity and can therefore be used on live electrical hazards. In summary, carbon dioxide is a relatively inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"

- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

**Open Items and VFDRs**

-None



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-CS-1

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

##### Compliance Basis:

Complies by Prior Approval

The fire loading determined that a fire barrier of less than 1 1/2 hr is required. The existing walls, floor slab, ceiling, and doors exceed this required rating.

NRC letter dated August 30, 1984 granted several exemptions including one for CS-1 from III.G.2 since the floor and the stairtower door do not provide a 3-hour rated barrier, based on having a 1.5-hour rated floor and a 1.5-hour rated door.

Complies with Use of EEEE

FPPCE 12-025 evaluates the an electrical ductline in the west portion of the cable mezzanine. The evaluation concludes the ductline and 8 inches of concrete provide a 3 hour rating.

FPPCE 06-021 R1 evaluates the installed configuration of the untested caulk fire seal for the barrier separating 1-CS-1 and 1-ES-1. The evaluation concludes that the configuration is acceptable.

##### Licensing Actions

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### References

- 1-PIP-S19, Rev. 3, "Fireproofing Repairs on Structural Steel in Service Building, BVPS#1"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

##### Supporting EEEEs

- FPPCE 06-021 Rev.1
- FPPCE 12-025 Rev.0

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-B-084, Rev. 12, Add. 1, "Fire Hazards Analysis"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0001G, Rev. 9, "Floor Plan Elev. 725'-6" Service Building"
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735'-6 Outline Service Bldg."
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 89-12-19, "BVPS-1 (TAC 56566) – Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- EM 30318, "NRC Inspection #83-69: Fire Dampers"
- TER 00306, "Vendor Technical Information for Replacement Fire Dampers VS-D-259 and 260"
- TER 10864, Rev. 0, "Evaluation of Six Penetration Seals in the Control Room Floor"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-DSS-0029, Rev. 1, "Fireproofing Installation on Structural Steel in Service Building"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713'-6 Service Bldg."
- 8700-RC-0008D, Rev. 11, "Slab Plan at El. 735'-6"-Reinf, Service Building"
- 8700-RC-0008G, Sht. 2, Rev. 10, "Sections Service Building"
- 8700-RS-0005D, Rev. 10, "Mezzanine Floor Framing Service Building"
- 90-06-29, "BVPS-1 – Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- CERF 000569, Rev. 0, "Replacement of CAFCO 800 Fireproofing with Fendolite TG Fireproofing"
- DCP-0694, "Fire Proofing of Structural Steel Service Building El. 713"
- ECP 02-0514, Rev. 1, "Damper Modification for Fire Area CS-1"
- FPPCE 02-031, Rev. 1, "Modification to Fire Damper 1VS-D-259"
- TER 10495, Rev. 0, "Use of CAFCO 800 as a Repl. for Disc. CAFCO 560 Fireproofing on Struct. Steel in the Svc Bldg"
- TER 11561, Rev. 0, "Penetr. CR-735-259 Internal Conduit Seal Alternate Seal Arrgmt. and Temp. Seal Approval"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CS-1**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Fire Doors

Fire door S25-1 between stairwell 1-S-5 and a platform near the entrance to 1-CS-1 is not part of the fire boundary of this area, but is identified as a 1.5-hour fire door.

Fire door S25-2 is part of the boundary of the area and is a 3-hour fire door.

Fire door S25-3 between 1-CS-1 and stairwell 1-S-4 is a 1.5-hour fire door and is acceptable by NRC letter dated August 30, 1984.

Fire doors S25-4 and S25-5 are also part of the area boundary. These doors are discussed in Records 3.11.3 for 1-CV-1 and 1-CV-2 and are 3-hour fire doors.

Fire doors S25-2, S25-3, S25-4, and S25-5 were identified as having the addition of a security card reader. NRC letter dated December 4, 1986 granted exemptions based on the fire severity rating calculated for the area.

Fire Dampers

Duquesne Light memorandum ND1TPP:0219 dated September 27, 1984 transmitted the report of an internal inspection of all fire dampers. The inspection identified that while some fire dampers in this area had proper UL labeling, many did not.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Some fire dampers in this area did not have an UL label while other dampers were previously replaced with UL qualified dampers by DCP 268. Duquesne Light letter dated December 19, 1989 stated that for fire areas with combustible loading exceeding 1 hour, all fire dampers (a total of 17) would be replaced, and for fire areas with combustible loading less than one hour, an evaluation will be conducted to determine the acceptability of the existing sheet metal ductwork. The engineering evaluations pertaining to those areas were attached to this letter.

NRC letter dated June 29, 1990 stated that the Duquesne Light methodology to correct the problem was similar to one approved by the staff for the Susquehanna facility and that the staff had no objections to the corrective actions and schedule. Duquesne Light letter dated July 22, 1991 informs the NRC that all 17 fire dampers were replaced during the 8th refueling outage, they were operationally tested, and declared operable based on satisfactory testing results.

ECP-02-0514 modified 1VS-D-259 so that it doesn't close to provide a relief path for CO2 in case of a discharge to prevent over pressurization of the area. Fire Protection Program Change Evaluation 02-031 included with the package includes an 86-10 evaluation to show that this configuration of the damper will prevent the spread of a fire between CS-1 and SB-GEN.

Administrative and maintenance procedures periodically perform preventive mechanical maintenance of fire dampers and perform periodic as found trip checks.

#### Licensing Actions

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### References

- 1-PIP-S19, Rev. 3, "Fireproofing Repairs on Structural Steel in Service Building, BVPS#1"
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"

#### Supporting EEEs

FPPCE 02-031 Rev.0

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1BVT 1.33.5, Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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#### References

- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"
- 8700-10.001-0927, Rev. B, "Mullion Fabrication and Fire Damper Installation Details"
- 8700-10.001-1008, Rev. A, "Fire Damper VS-D-283 Installation & Fabrication Details"
- 8700-10.001-1019, Rev. A, "Fire Damper VS-D-268 Installation & Fabrication Details"
- 8700-10.001-1023, Rev. A, "Fire Damper VS-D-281 Installation & Fabrication Details"
- 8700-10.001-1026, Rev. A, "Fire Damper VS-D-285 Installation & Fabrication Details"
- 8700-10.001-1031, Rev. A, "Fire Damper VS-D-289 Installation & Fabrication Details"
- 8700-10.001-1099, Rev. C, "Penetration Seal Tables for Service Building EL. 735'-6"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0001G, Rev. 9, "Floor Plan Elev. 725'-6" Service Building"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RB-0017L, Rev. 11, "Vent & Air Cond. El. 725'-6" Service Building Sh. 11"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0008D, Rev. 11, "Slab Plan at El. 735'-6"-Reinf, Service Building"
- 8700-RC-0008G, Sht. 2, Rev. 10, "Sections Service Building"
- 8700-RS-0005D, Rev. 10, "Mezzanine Floor Framing Service Building"
- 90-06-29, "BVPS-1 – Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- CERF 000569, Rev. 0, "Replacement of CAFCO 800 Fireproofing with Fendolite TG Fireproofing"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1007, Rev. A, "Fire Damper VS-D-282"
- 8700-10.001-1017, Rev. A, "Fire Damper VS-D-267 Installation & Fabrication Details"
- 8700-10.001-1021, Rev. A, "Fire Dampers VS-D-269 A/B Installation & Fabrication Details"
- 8700-10.001-1025, Rev. A, "Fire Damper VS-D-284 Installation & Fabrication Details"
- 8700-10.001-1027, Rev. A, "Fire Damper VS-D-286 Installation & Fabrication Details"
- 8700-10.001-1033, Rev. A, "Fire Damper VS-D-291 Installation & Fabrication Details"
- 8700-10.001-1120, Rev. C, "Fire Area CS-1, Access to Ceiling Penetrations"
- 8700-DSS-0029, Rev. 1, "Fireproofing Installation on Structural Steel in Service Building"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017E, Sht. 5, Rev. 9, "Plans & Sections Service Building"
- 8700-RB-0017H, Rev. 10, "Vent & Air Cond El. 725'-6" Service Building Sh. 8"
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735-6 Outline Service Bldg."
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 89-12-19, "BVPS-1 (TAC 56566) – Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- DCP-0694, "Fire Proofing of Structural Steel Service Building El. 713"
- ECP 02-0514, Rev. 1, "Damper Modification for Fire Area CS-1"

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**References**

- |   |  |
|---|--|
| - EM 30318, "NRC Inspection #83-69: Fire Dampers"   | - FPPCE 02-031, Rev. 1, "Modification to Fire Damper 1VS-D-259"  |
| - TER 00306, "Vendor Technical Information for Replacement Fire Dampers VS-D-259 and 260" | - TER 10495, Rev. 0, "Use of CAFCO 800 as a Repl. for Disc. CAFCO 560 Fireproofing on Struct. Steel in the Svc Bldg" |
| - TER 10864, Rev. 0, "Evaluation of Six Penetration Seals in the Control Room Floor"      | - TER 11561, Rev. 0, "Penetr. CR-735-259 Internal Conduit Seal Alternate Seal Arrgmt. and Temp. Seal Approval"       |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                            |  |

**Open Items and VFDRs**

-None

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

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-2653 Eval. #11 R2 A1  
8700-DMC-2840 Eval. #2 R0 A0  
8700-DMC-2840 Eval.#1 R0 A2  
8700-DMC-2840 Eval.#3 R0 A2  
FPPCE 06-043 Rev.0  
FPPCE 11-024 Rev.0  
FPPCE 11-025 Rev.1  
FPPCE 11-026 Rev.0  
FPPCE 12-124 Rev.0  
FPPCE 13-008 Rev.0  
FPPCE 13-009 Rev.0

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 2701.620-000-064, Rev. A, "Fire Risk Evaluation of Main Steam Valve Area (2-MS-1)"

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

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**References**

- 8700-10.001-0668, Rev. H, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Walls"  
- 8700-10.001-0670, Rev. K, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Wall"  
- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"  
- 8700-10.001-1099, Rev. C, "Penetration Seal Tables for Service Building EL. 735'-6"

- 8700-10.001-0669, Rev. M, "Control Room EL. 735'-6" 3 HR. Fire Rated Floor and Walls"  
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"  
- 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"  
- 8700-10.001-1120, Rev. C, "Fire Area CS-1, Access to Ceiling Penetrations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Fire Compartment - 1-CV-1**

**Compliance Statement:**   Complies  
  Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

Complies

The Cable Vault, 1-CV-1, is provided with area ionization detection. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10 with the exception of item 3.

1. Confirmed the detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies with Use of EEEE

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3. An engineering evaluation determined a detector could be removed from service with no adverse affects on safe shutdown.

**Licensing Actions**

- None

**Supporting EEEEs**

8700-DMC-1575 R0 A0  
 FPPCE 07-012 Rev.0  
 FPPCE 12-088 Rev.0  
 FPPCE 13-008 Rev.0  
 FPPCE 13-011 Rev.0

**References**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"</li> <li>- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"</li> <li>- 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" &amp; 756'-0", Cable Vault Area"</li> <li>- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"</li> <li>- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"</li> <li>- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM &amp; SECURITY ALARM SYSTEM"</li> <li>- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"</li> </ul> | <ul style="list-style-type: none"> <li>- 10ST-33.16B, Rev. 2, "Early Warning Smoke Det. Instr. Test Diesel Gen. Rms Cable Vaults and Cable Mezzanine"</li> <li>- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"</li> <li>- 8700-RC-0021G, Rev. 14, "Section, Cable Vault Area"</li> <li>- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM &amp; SECURITY ALARM SYSTEM"</li> <li>- 8700-RE-0064JQ, Rev. 1, "Cable Block Diagram - Fire Detection DGP-3, 4, &amp; 5"</li> <li>- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"</li> </ul> |
|--|---|

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**Fire Compartment - 1-CV-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

The total flooding CO2 system was specified to conform to the requirements of NFPA No. 12-1973. Initial actuation is by temperature or it can be actuated manually. A second actuation can be performed manually. The following critical attributes of the code were evaluated to ensure functionality and reliability;

Items 2 through 13 comply with the exception of 1 and 4 as noted below:

Complies

2. After review of the post-installation tests, the acceptance criteria for concentration was met.

3. The review concluded there is an audible pre-discharge alarm and a 30-second time delay before discharge begins.

5. It was confirmed that for emergency manual control there is a break glass station which will utilize CO2 pressure to open the local valve and manually discharge CO2 to the area upon a loss of power to the main control cabinet. There is a similar break glass station located near the 10-ton CO2 tank that can be operated to open the master valve.

6. It was confirmed that the pressure and level of the 10-ton CO2 tank are recorded periodically.

7. The CO2 tank level and pressure alarms were confirmed to send alarm signals to the main control room.

8. A review of the purchase specification confirmed that all piping between the master and selector valves and open end piping is steel and conforms to ASTM A53, which is acceptable.

9. The administrative test procedure confirms that the actual pre-discharge time is acceptable, and that the manual actuation by a pushbutton completes the entire discharge cycle in the acceptable time frame.

10. The dampers are inspected to ensure that they trip when the CO2 discharge occurs and are also confirmed operable by a visual inspection. TER 10497 documented the removal of automatic closure chains and capping of pilot piping in the CO2 system for fire doors based on administrative controls.

11. To prevent over pressurization a ventilation duct in 1-CV-1 was installed that would route through the PCA shop and exit to the atmosphere through the PCA shop roof.

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

### Fire Protection Features Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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12. The CO2 panels were confirmed to have primary and secondary power supplies.

13. Appropriate fire watches are established by procedure when the system is discovered degraded or inoperable.

Complies with use of EEEE

1. Calculations were confirmed to ensure adequate flow rate and designed concentrations for suppression of the most limiting fire hazard. An EEEE was completed to verify the concentration calculations.

4. There are four active heat detectors in 1-CV-1. These detectors will alarm to an annunciator in the control room. A fifth detector was removed from service due to accessibility. The absence of this detector is justified with use of EEEE.

#### Licensing Actions

- None

#### Supporting EEEEs

8700-DMC-1575 R0 A0

8700-DMC-2653 Eval. #11 R2 A1

8700-DMC-2708 R0 A0

FPPCE 07-012 Rev.0

FPPCE 12-088 Rev.0

FPPCE 13-008 Rev.0

#### References

- "Fire Protection Handbook, Sixteenth Edition"

- 1OM-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"

- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"

- 1OST-33.9, Rev. 8, "CO2 Fire Protection System Inspection Test"

- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"

- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"

- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"

- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"

- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "

- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"

- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"

- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"

- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"

- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"

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### Fire Protection Features

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#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0001V, Rev. 31, "25V DC One Line Diagram"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

##### Open Items and VFDRs

-None

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

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

The fire suppression for the Cable Vault (CV-1) is a total flooding carbon dioxide (CO2) system.

The gaseous fire suppression system is controlled by a local control panel with a local alarm, and that alarms to the main control room for a fire condition or system trouble or CO2 discharge.

**Licensing Actions**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 10M-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"

**Supporting EEEEs**

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDOX System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaulation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"

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**References**

- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

**Open Items and VFDRs**

-None

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

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#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-CV-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

#### **Compliance Basis:**

1-CV-1 has an installed ventilation duct that routes through the PCA shop and exits to the atmosphere through the PCA shop roof. The duct is equipped with a spring-loaded-to-close, soft-seated, pressure relief damper to ensure minimal loss of CO2 from the area. A calculation demonstrates that the fire area will still maintain the CO2 concentrations greater than 50% in the long term. In addition, a CO2 discharge will trip the Cable Vault Area Air Handling Unit Condenser (1VS-AC-8) by the closure of PS-1FP-CDL2A and other dampers to prevent loss of the carbon dioxide.

1-CV-1 cable vault is part of the radiological Controlled Area of the station but the radiological conditions are minimal, therefore in the event of a fire and the CO2 discharge, there would essentially be no radiological release.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 10M-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"

#### Supporting EEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDOX System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaulation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

##### Open Items and VFDRs

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-1**

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

### **Compliance Basis:**

The area is not required to be protected by both primary and backup gaseous fire suppression systems. Backup fire suppression is provided by fire hose stations and extinguishers. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability.

### **Licensing Actions**

- None

### **Supporting EEEs**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 10M-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDOX System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaulation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-1**

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

The Lock-Out switch station (LO-FE-2A) is located just outside of the CO2 protected area in the radiological/security controlled area. Upon lockout of the CO2 system to the abnormal position a main control room annunciator will alarm.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDOX System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-CV-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

#### **Compliance Basis:**

1-CV-1 is in the Radiological Controlled Area and access is through either a locked door accessed by a card-reader from the PCA Shop or from an unlocked door in Stairwell S-2. This area is not normally occupied by personnel.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

#### Supporting EEEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

##### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-CV-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

#### **Compliance Basis:**

The presence of an odorizer, an audible pre-discharge alarm in the form of a horn and a 30-second time delay before the discharge begins are confirmed periodically by procedure.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

#### Supporting EEEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

#### Beaver Valley Unit 1

##### References

- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

##### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 1

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment** - 1-CV-1

**Compliance Statement:** Will Comply with the Use of Commitment

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

#### **Compliance Basis:**

A modification to provide positive mechanical means to lockout the total flooding carbon dioxide systems during work in automatic CO2 protected space is included in Attachment S.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

#### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"

- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"

#### Open Items and VFDRs

##### **VFDR Number**

BV1-0746

CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805 section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:

NA

##### **Disposition**

This VFDR will be corrected by a plant modification.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-CV-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The CO2 nozzles are in the overhead near the ceiling and the cabinets and panels are mostly located on the floor. Typically, cable trays in the main section of the room are located approximately 5 feet below the nozzles with the exception in the tunnel section of the room leading towards the cable tray mezzanine where the nozzles are located directly above the top of cable trays. These CO2 nozzles discharge horizontally instead of vertically. There are no safe shutdown cabinets in this tunnel portion of 1-CV-1, and all cable trays are enclosed in the tunnel. Therefore, there is reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

**Licensing Actions**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"

**Supporting EEEs**

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

##### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-CV-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.10 - Corrosive characteristics

#### Compliance Basis:

Carbon dioxide suppression systems are non-corrosive, non-damaging, and leave no residue to clean up after the fire, and it will not conduct electricity and can therefore be used on live electrical hazards. In summary, carbon dioxide is a relatively inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABE, Rev. 0, "West Cable Vault Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

#### Supporting EEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- CR 07-13327, "Triennial - Documentation of Code Compliance for Retired Cable Vault HAD"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2A2, Rev. 1, "Setpoint Document for TD-1FE-2A2"
- SPD-TD-1FE-2A5, Rev. 1, "Setpoint Document for TD-1FE-2A5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-18V, Sht. 2, Rev. 7, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2A"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2A1, Rev. 1, "Setpoint Document for TD-1FE-2A1"
- SPD-TD-1FE-2A4, Rev. 1, "Setpoint Document for TD-1FE-2A4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 3 hour fire rating. Fire barriers range from 8 inches to 24 inches of concrete from this fire compartment.

The fire barriers are periodically inspected.

Complies with Use of EEEE

Fire Compartments 1-CV-1 and 1-CV-2 areas are separated by a 12-in reinforced concrete wall and stair tower. Parts of the wall are constructed of 12 inch concrete masonry block and evaluated to show the equivalent thickness of a 12-inch block wall at BV1 is greater than the equivalent thickness of a block wall with a 4-hour fire rating. Additionally, part of the west wall between 1-CV-1 and 1-QP-1 is a 24" thick block wall which is similarly evaluated to have greater than a 4-hour fire rating.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-1575 R0 A0  
8700-DMC-2653 Eval. #3 & #4 R2 A1  
8700-DMC-2708 R0 A0  
EM 71592

**References**

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"</li><li>- 8700-B-084, Rev. 12, "Fire Hazards Analysis"</li><li>- 8700-RA-0008B, Rev. 3, "Plans, Sects &amp; Dets- Stairs Serv. Bldg &amp; Cable Vault"</li><li>- 8700-RA-0025EK, Rev. 1, "Block Wall CV 2-2 Cable Vault Area El. 735'-6"</li><li>- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"</li></ul> | <ul style="list-style-type: none"><li>- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"</li><li>- 8700-RA-0001G, Rev. 9, "Floor Plan Elev. 725'-6" Service Building"</li><li>- 8700-RA-0025EJ, Rev. 1, "Block Wall CV2-1 Cable Vault Area El. 735'-6"</li><li>- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"</li><li>- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."</li></ul> |
|---|---|

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |  |  |
|--|--|
| - 8700-RC-0008H, Rev. 11, "Sections, Service Building"                                   | - 8700-RC-0021A, Rev. 17, "Slab Plan El. 722'-6" & El. 725'-6" Cable Vault Area" |
| - 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"                         | - 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"                    |
| - BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry" | - EM 71592, "Fire Rating of Block Walls"   |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                           |  |

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-1**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Fire Doors:

There are 7 fire doors for this area. Drawings depict general door locations and their respective fire rating.

Fire door S25-4 between 1-CV-1 and 1-CS-1 is a 3 hour fire door and was identified as having an unlabeled structural channel frame as well as a security modification of a magnetic alarm switch on the door face and frame.

Fire door MS35-5 between 1-CV-1 and 1-QP-1 is a 3-hour fire door.

Fire door CV35-1A between 1-CV-1 and the PCA shop is not a rated fire door and does not form the boundary of the area.

Fire door CV35-1 on H column line is part of the fire barrier between 1-CV-1 and the PCA shop, and the door schedule identifies this as a 3-hour fire door; however it was also identified as having security modification of a magnetic alarm switch on the door face and frame and a conduit penetrating through the frame of the door.

Fire door CV35-2 between 1-CV-1 and the cable vault stairwell, S-2 is a 1.5-hour fire door.

Fire door CV35-3 between the stairwell and 1-CV-2 is also a 1.5-hour fire door.

Fire door CV35-2 and CV35-3 provides two 1.5-hour doors in series between the two cable vaults.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

NRC letter dated December 4, 1986 granted exemptions based on the fire severity calculated for the area.

Fire Dampers:

Drawings identify ductwork and their associated fire dampers for the 1-CV-1 area. The drawings identify 3 fire dampers in the area with functional locations of 1VS-D-177, 1VS-D-184, and 1VS-D-361. These fire dampers protect all but one of the ductwork penetrations of the fire rated perimeter boundary of 1-CV-1.

Damper 1VS-D-177 between 1-CV-1 and 1-MS-1 was an exception to the convention of replacing unqualified dampers in areas with fire loadings greater than an hour. This damper was not replaced but instead evaluated by an 86-10 evaluation. The methodology used was found acceptable in NRC letter dated June 29, 1990.

ECP 04-0063 was created to relieve an overpressurization concern in the east and west cable vaults due to a CO2 discharge. The package created a vent path through the wall of each cable vault into the PCA shop and through a duct to the roof. On the cable vault side of the wall there is a 15" by 21" opening. On the PCA side, there is 21" by 21" opening with a relief damper, which is not a fire rated damper, and leading into a duct to the roof. Fire Protection Program Change Evaluation 06-038 included with the change package performs an 86-10 evaluation to show that the ducts, as installed, will be adequate for the boundaries between the PCA shop and the west cable vault.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

8700-DMC-2708 R0 A0  
FPPCE 06-038 Rev.0

**References**

- 1-RB-0017U-E04-0063-01, Rev. 5, "IDCN for RB-0017U Rev. 0 For ECP-04-0063 - East and West Cable Vault Wall "
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OM-54.3.L3-1-2 , Rev. 1, "Non-Security Related Fire Door Check"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 1OM-54.3.L4-1 , Rev. 0, "Non-Security Related Fire Door Check"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

#### References

- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations El. 735'-6"
- 8700-10.001-0692, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-10.001-1016, Rev. A, "Fire Damper VS-D-184 Installation & Fabrication Details"
- 8700-10.001-1039, Rev. A, "Fire Damper VS-D-361 Installation & Fabrication Details"
- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault & Safeguards Areas, Adjacent to Containment"
- 8700-DMC-1575, Rev. 0, "Generic Letter 86-10 Evaluation of Shakespace Seals ECV-725-502 & ECV-725-503"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0001G, Rev. 9, "Floor Plan Elev. 725'-6" Service Building"
- 8700-RA-0025EJ, Rev. 1, "Block Wall CV2-1 Cable Vault Area El. 735'-6"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0005K, Sht. 10, Rev. 5, "Air Cooling Pipe Tunnel & Misc Areas"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0021A, Rev. 17, "Slab Plan El. 722'-6" & El. 725'-6" Cable Vault Area"
- 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.035-0170, Rev. F, "West Cable Vault El 735'-6" Wall and Floor Penetrations"
- 8700-10.001-0691, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room El. 722'-6" and El. 735'-6", 3 HR Fire Rated Walls"
- 8700-10.001-1015, Rev. A, "Fire Damper VS-D-184 Installation & Fabrication Details"
- 8700-10.001-1038, Rev. A, "Fire Damper VS-D-361 Installation & Fabrication Details"
- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-2708, Rev. 0, "Analysis of Unqualified Fire Damper VS-D-177 in the West Cable Vault"
- 8700-RA-0001D, Sht. 1, Rev. 17, "Floor Plan Service Building"
- 8700-RA-0008B, Rev. 3, "Plans. Sects & Dets- Stairs Serv. Bldg & Cable Vault"
- 8700-RA-0025EK, Rev. 1, "Block Wall CV 2-2 Cable Vault Area El. 735'-6"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room & Misc Areas"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- CR 03-08546, "Missing Shakespace Fire Boundary Seal Material"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- EM 71592, "Fire Rating of Block Walls"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-1575 R0 A0

8700-DMC-2653 Eval. #11 R2 A1

FPPCE 12-088 Rev.0

FPPCE 13-008 Rev.0

FPPCE 13-011 Rev.0

**References**

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations El. 735'-6"

- 8700-10.001-0692, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"

- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls El. 751'-0" - 756'-0"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"

- 8700-10.001-0691, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"

- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"

- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-0720, Rev. G, "Main Steam & MCC Room Data Sheet"
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room EL. 722'-6" and EL. 735'-6", 3 HR Fire Rated Walls"
- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"
- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-CV-2

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

##### Compliance Basis:

Complies

The Cable Vault, 1-CV-2, is provided with area ionization detection. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10, with the exception of item 3.

1. Confirmed the detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies with Use of EEEE

3. Confirmed most of the ceiling mounted smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage except

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

for D-97. An engineering evaluation determined the detector configuration is adequate for the hazard.

**Licensing Actions**

- None

**Supporting EEEs**

8700-DMC-1575 R0 A0  
FPPCE 12-088 Rev.0  
FPPCE 12-121 Rev.0  
FPPCE 13-008 Rev.0  
FPPCE 13-010 Rev.0  
FPPCE 13-011 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" & 756'-0", Cable Vault Area"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JQ, Rev. 1, "Cable Block Diagram - Fire Detection DGP-3, 4, & 5"
- 8700-RE-64JM, Rev. 1, "Wiring Diagram, PNL-CU-37 & PNL-CU-38, Fire Protection System"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16B, Rev. 2, "Early Warning Smoke Det. Instr. Test Diesel Gen. Rms Cable Vaults and Cable Mezzanine"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
- 8700-RC-0021L, Rev. 12, "Sections, Cable Vault Area"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-2**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

The total flooding CO2 system was specified to conform to the requirements of NFPA No. 12-1973. Initial actuation is by temperature or it can be actuated manually. A second actuation can be performed manually. The following critical attributes of the consensus code were evaluated to ensure functionality and reliability;

1. Calculations were confirmed to ensure adequate flow rate and designed concentrations for suppression of the most limiting fire hazard.
2. A condition report documented that the original post-installation concentration test for 1-CV-2 stated that the subject test determined that the middle elevation failed to achieve 50 percent concentration during the test, but this was attributed to a test anomaly associated with a bad meter reading, however readings at the higher elevations were in excess of 50 percent held for approximately 7 minutes. This demonstrates that the criteria was met for the middle levels considering CO2 is heavier than air.
3. The review concluded there is an audible pre-discharge alarm and a 30-second time delay before discharge begins.
4. There are five active heat detectors in 1-CV-2 with a design point of 190 degrees. These detectors will alarm to an annunciator in the control room.
5. It was confirmed that for emergency manual control there is a break glass station that has a mechanical lever that can be moved which will utilize CO2 pressure to open the local valve and manually discharge CO2 to the area upon a loss of power to the main control cabinet. There is a similar break glass station located near the 10-ton CO2 tank that can be operated to open the master valve.
6. It was confirmed that the pressure and level of the 10-ton CO2 tank are recorded periodically.
7. The CO2 tank level and pressure alarms were confirmed to send alarm signals to the main control room.
8. A review of the purchase specification confirmed that all piping between the master and selector valves and open end piping is steel and conforms to ASTM A53, which is acceptable to the consensus code.
9. The administrative test procedure confirms that the actual pre-discharge time is acceptable, and that the manual actuation by a pushbutton completes the entire discharge cycle in the acceptable time frame.
10. The dampers are inspected to ensure that they trip when the CO2 discharge occurs and are also confirmed operable by a visual inspection. TER 10497 documented the removal of automatic closure chains and capping of pilot piping in the CO2 system for fire doors. The basis for the removal states that

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

administratively, station personnel shall ensure that fire doors are kept closed, unblocked, or continuously guarded except when opened for passage into and out of an area

11. To prevent over pressurization a ventilation duct in 1-CV-2 was installed that would route through the PCA shop and exit to the atmosphere through the PCA shop roof.

12. The CO2 panels were confirmed to have primary and secondary power supplies.

13. Appropriate fire watches are established by procedure when the system is discovered degraded or inoperable.

### **Licensing Actions**

- None

### **Supporting EEEs**

8700-DMC-1575 R0 A0  
8700-DMC-2653 Eval. #11 R2 A1  
FPPCE 11-026 Rev.0  
FPPCE 12-088 Rev.0  
FPPCE 13-008 Rev.0  
FPPCE 13-010 Rev.0  
FPPCE 13-011 Rev.0

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"  
  
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"  
  
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"  
- 8700-RE-0001V, Rev. 31, "25V DC One Line Diagram"  
  
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"

- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"  
- 1OST-33.9, Rev. 8, "CO2 Fire Protection System Inspection Test"  
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-RB-005P, Rev. 10, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"  
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"  
  
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Document For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

##### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-CV-2

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

#### **Compliance Basis:**

The fire suppression for the Cable Vault (1-CV-2) is total flooding carbon dioxide (CO2) system.

The gaseous fire suppression system is controlled by a local control panel with a local alarm, and that alarms to the main control room for a fire condition or system trouble or CO2 discharge.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"

#### Supporting EEEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Docment For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

1-CV-2 has an installed ventilation duct that routes through the PCA shop and exits to the atmosphere through the PCA shop roof. The duct is equipped with a spring-loaded-to-close, soft-seated, pressure relief damper to ensure minimal loss of CO2 from the area. A calculation demonstrates that the fire area will still maintain the CO2 concentrations greater than 50% in the long term. In addition, a CO2 discharge will trip the Cable Vault Area Air Handling Unit Condenser (1VS-AC-8) by the closure of PS-1FP-CDL2B and other dampers to prevent loss of the carbon dioxide.

1-CV-2 cable vault is part of the radiological Controlled Area of the station but the radiological conditions are minimal, therefore in the event of a fire and the CO2 discharge, there would essentially be no radiological release.

**Licensing Actions**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"

**Supporting EEEEs**

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 1OST-33.9, Rev. 8, "CO2 Fire Protection System Inspection Test"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Document For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

##### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

The area is not required to be protected by both primary and backup gaseous fire suppression systems. Backup fire suppression is provided by fire hose stations and extinguishers. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability.

**Licensing Actions**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"  
- 10M-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "  
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "  
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"  
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"  
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

**Supporting EEEEs**

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"  
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"  
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"  
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"  
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"  
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"  
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"  
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"  
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Document For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

##### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-CV-2

**Compliance Statement:** Complies with Clarification

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

#### **Compliance Basis:**

The Lock-Out switch station (LO-FE-2B) is located just outside of the CO2 protected area in the radiological/security controlled area. Upon lockout of the CO2 system to the abnormal position a main control room annunciator will alarm.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 10M-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

#### Supporting EEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 10ST-33.9, Rev. 8, "CO2 Fire Protection System Inspection Test"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDOX System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Document For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-2**

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

### **Compliance Basis:**

Access to area CV-2 is through unlocked doors in Stairwell S-2 or from Fire Area PT-1. 1-CV-2 is located in the Radiological Controlled Area of the station, ensuring that personnel entering the area are signed onto a Radiological Work Permit, and have approval to enter the area. This area is not normally occupied by personnel.

### **Licensing Actions**

- None

### **Supporting EEEs**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Document For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-CV-2

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

#### **Compliance Basis:**

The presence of an odorizer, an audible pre-discharge alarm in the form of a horn and a 30-second time delay before the discharge begins was verified are confirmed periodically by procedure.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"  
- 1OM-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "  
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "  
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"  
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"  
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

#### Supporting EEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"  
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"  
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"  
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"  
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"  
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"  
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"  
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"  
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Docment For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-2

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

A modification to provide positive mechanical means to lockout the total flooding carbon dioxide systems during work in automatic CO2 protected space is included in Attachment S..

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-0746	CO2 Fire Suppression System Lacks Local Isolation Valves
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The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805 section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-CV-2

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.9 - Secondary thermal shock

#### Compliance Basis:

The CO2 nozzles are in the overhead near the ceiling and the cabinets and panels are mostly located on the floor. Typically, cable trays in the main section of the room are located approximately 2-5 feet below the nozzles with the exception in the tunnel section of the room leading towards the cable tray mezzanine where the nozzles are located directly above the top of cable trays. These CO2 nozzles discharge horizontally instead of vertically. There are no safe shutdown cabinets in this tunnel portion of 1-CV-2, and all cable trays are enclosed in the tunnel. Therefore, there is reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"  
- 10M-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "  
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "  
- 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"  
- 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"

#### Supporting EEEs

- None

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"  
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"  
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"  
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"  
- 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
- 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
- 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"  
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"  
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"  
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Document For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

##### Open Items and VFDRs

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-2

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

### **Compliance Basis:**

Carbon dioxide suppression systems are non-corrosive, non-damaging, and leave no residue to clean up after the fire, and it will not conduct electricity and can therefore be used on live electrical hazards. In summary, carbon dioxide is a relatively inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment.

### **Licensing Actions**

- None

### **Supporting EEEEs**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"  
 - 1OM-33.4.ABF, Rev. 0, "East Cable Vault Fire Prot System Trouble "  
 - 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
 - 8700-10.001-0383, Sht. 2, Rev. B, "CARDON System "  
 - 8700-DMC-1558, Rev. 0, Add. 0, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
 - 8700-DMC-1558, Rev. 0, Add. 2, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
 - 8700-DSC-0239, Rev. 0, Add. 0, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
 - 8700-DSC-0239, Rev. 0, Add. 2, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
 - 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"  
 - 8700-RE-0018W, Rev. 4, "CO2 Fire Protection Wiring Dia. Cabinets FE-CDL-2B, 3 & 4A Sht. 3"  
 - 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"  
 - 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"  
 - 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"  
 - 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"  
 - 8700-B-084, Rev. 12, "Fire Hazards Analysis"  
 - 8700-DMC-1558, Rev. 0, Add. 1, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
 - 8700-DMC-1558, Rev. 0, Add. 3, "Analysis of BVPS-1 East and West Cable Vault CO2 Discharge"  
 - 8700-DSC-0239, Rev. 0, Add. 1, "Evaluation of CO2 Vent Openings in Cable Vault North Wall"  
 - 8700-LSK-20-2D, Rev. 8, "Logic Diagram - CO2 Fire Protection System"  
 - 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"  
 - 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"  
 - 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"  
 - 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21MV, Rev. 5, "Elem. Diagram Ventilation System (VS) Sh. 20 of 29 Misc Main Station Areas Sh. 3 of 3"
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- CR 03-01295, "Potential CO2 Pressure Transient for the Unit 1 East and West Cable Vaults"
- FL-17727, Rev. 0, "Cardox Calculation"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-2B2, Rev. 1, "Setpoint Document for TD-1FE-2B2"
- SPD-TD-1FE-2B4, Rev. 1, "Setpoint Document For TD-1FE-2B4"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0192, "Unit 1 Cable Mezzanine Fire Suppression System Test Data"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- LER 2003-002-01, "Potential Overpress. of BV1 Cable Vaults if a CO2 Disch. Were to Occur, Results in Unanal. Cond. "
- SPD-TD-1FE-2B1, Rev. 1, "Setpoint Document For TD-1FE-2B1"
- SPD-TD-1FE-2B3, Rev. 1, "Setpoint Document for TD-1FE-2B3"
- SPD-TD-1FE-2B5, Rev. 1, "Setpoint Document For TD-1FE-2B5"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

##### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-CV-2

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

##### Compliance Basis:

Complies

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 3 hour fire rating. Barriers of this fire compartment range from 8 to 24 inches of concrete.

The fire barriers are periodically inspected.

Complies with Use of EEEE

The wall and stair tower between the two cable vaults is 12 inches of reinforced concrete. As a part of this barrier, block wall CV-2-1 is also included. The block wall is constructed of 12 inch concrete masonry block and evaluated to show the equivalent thickness of a 12-inch block wall at BV1 is greater than the equivalent thickness of a block wall with a 4-hour fire rating.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

8700-DMC-1575 R0 A0  
EM 71592

#### References

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-RA-0008B, Rev. 3, "Plans, Sects & Dets- Stairs Serv. Bldg & Cable Vault"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0021A, Rev. 17, "Slab Plan El. 722'-6" & El. 725'-6" Cable Vault Area"
- 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"
- EM 71592, "Fire Rating of Block Walls"

- 8700-RA-0001G, Rev. 9, "Floor Plan Elev. 725'-6" Service Building"
- 8700-RA-0025EJ, Rev. 1, "Block Wall CV2-1 Cable Vault Area El. 735'-6"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-2**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Fire Doors:

There are 7 fire doors for this area. Drawings depict general door locations and their respective fire rating.

Fire door S25-5 between 1-CV-2 and 1-CS-1 is a 3 hour fire door.

Fire door CV35-4 between 1-CV-2 and 1-PT-1 is a 3 hour fire door.

Fire door CV35-3 between 1-CV-2 and the cable vault stairwell, S-2 is 1.5 hour fire rated.

Fire door CV35-2 between the stairwell and 1-CV-1 is 1.5 hour fire rated.

The 1.5 hour fire doors, CV35-2 and CV35-3, are arranged in series between the two cable vaults.

In addition, door S25-5 was identified as having an unlabeled structural channel frame as well as a security modification of a magnetic alarm switch on the door face and frame. NRC letter dated December 4, 1986 granted exemptions based on the fire severity rating calculated for the area.

Fire Dampers:

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

Drawings identify ductwork and their associated fire dampers for the 1-CV-2 area. The drawings identify 4 fire dampers in the area with functional locations of 1VS-D-160, 1VS-D-161, 1VS-D-168, and 1VS-D-180. These fire dampers are all UL 3 hour fire listed

ECP 04-0063 was created to relieve an over-pressurization concern in the east and west cable vaults due to a CO2 discharge. The package created a vent path through the wall of each cable vault into the PCA shop and through a duct to the roof. On the cable vault side of the wall there is a 15" by 21" opening. On the PCA shop side, there is 21" by 21" opening with a relief damper, which is not a fire rated damper, and leading into a duct to the roof. An 86-10 evaluation concluded that the ducts as installed are adequate for the boundaries between the PCA shop and the east cable vault.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- FPPCE 06-038 Rev.0
- FPPCE 11-007 Rev.0

**References**

- 1-RB-0017U-E04-0063-01, Rev. 5, "IDCN for RB-0017U Rev. 0 For ECP-04-0063 - East and West Cable Vault Wall "
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OM-54.3.L3-1-2 , Rev. 1, "Non-Security Related Fire Door Check"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0691, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room EL. 722'-6" and EL. 735'-6", 3 HR Fire Rated Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1006, Rev. A, "Fire Damper VS-D-161 Installation and Fabrication Details"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 1OM-54.3.L4-1 , Rev. 0, "Non-Security Related Fire Door Check"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-10.001-0692, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-10.001-1005, Rev. A, "Fire Damper VS-D-160 Installation and Fabrication Details"
- 8700-10.001-1009, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-10.001-1010, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"
- 8700-10.001-1012, Rev. A, "Fire Damper VS-D-180 Installation and Fabrication Details"
- 8700-10.001-1014, Rev. A, "Fire Damper VS-D-180 Installation and Fabrication Details"
- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault & Safeguards Areas, Adjacent to Containment"
- 8700-DMC-1575, Rev. 0, "Generic Letter 86-10 Evaluation of Shakespace Seals ECV-725-502 & ECV-725-503"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RA-0025EJ, Rev. 1, "Block Wall CV2-1 Cable Vault Area El. 735'-6"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room & Misc Areas"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0021A, Rev. 17, "Slab Plan El. 722'-6" & El. 725'-6" Cable Vault Area"
- 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- EM 71592, "Fire Rating of Block Walls"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-10.001-1011, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"
- 8700-10.001-1013, Rev. A, "Fire Damper VS-D\_180 Installation and Fabrication Details"
- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"
- 8700-RA-0001G, Rev. 9, "Floor Plan Elev. 725'-6" Service Building"
- 8700-RA-0008B, Rev. 3, "Plans. Sects & Dets- Stairs Serv. Bldg & Cable Vault"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0005K, Sht. 10, Rev. 5, "Air Cooling Pipe Tunnel & Misc Areas"
- 8700-RB-2M, Rev. 12, "Fire Protection Arrangement"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- ECP-04-0063, Rev. 3, "Pressure Relief Modification for the Unit 1 East and West Cable Vaults"
- TER 12062, "East Cable Mezzanine Penetration ECM-725-213 Repair"

##### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-CV-2

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

- 8700-DMC-1575 R0 A0
- 8700-DMC-2653 Eval. #11 R2 A1
- FPPCE 11-026 Rev.0
- FPPCE 12-088 Rev.0
- FPPCE 13-008 Rev.0
- FPPCE 13-010 Rev.0
- FPPCE 13-011 Rev.0

#### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-01.035-0170, Rev. F, "West Cable Vault EI 735'-6" Wall and Floor Penetrations"
- 8700-10.001-0692, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-10.001-0691, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"</li><li>- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room El. 756'-0" 3 HR. Fire Rated Floor and Walls"</li><li>- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"</li><li>- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room El. 722'-6" and El. 735'-6", 3 HR Fire Rated Walls"</li><li>- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"</li></ul> | <ul style="list-style-type: none"><li>- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"</li><li>- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors &amp; Walls El. 751'-0" - 756'-0"</li><li>- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"</li><li>- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"</li></ul> |
|---|---|

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

#### **Compliance Basis:**

The Cable Vault, 1-CV-3, is provided with area ionization detection. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10.

1. Confirmed the detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

#### Licensing Actions

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

#### Supporting EEEEs

FPPCE 11-027 Rev.0

FPPCE 13-011 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"
- 1OST-33.16, Rev. 15, "Smoke Detector Instrumentation Test"
  
- 8700-01.080-0040, Rev. C, "Fire Alarm Exposed Cnd. Plan & Sections, DCP 268 Item 5a"
- 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"
- 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
  
- 8700-RE-0027A, Rev. 41, "Arrgt - Control and Computer Rooms"
- 8700-RE-0064D, Sht. 4, Rev. 15, "Plan-Fire Alarm & Security Alarm System"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"
- 8700-RM-0003K, Rev. 5, "Mach Loc Service Bldg Li Plan View - Control Room Addition"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
  
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"
- 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"
- 8700-RC-0008W, Rev. 7, "Elec. Cable Tunnel - Plan & Sects., Control Room Extension"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- 8700-RM-0416-001, Rev. 16, "Piping & Instrumentation Diagram - Ventilation & Air Cond Primary Plant"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-3**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies by Previous Approval:

Fire area 1-CV-3 was granted an exemption by NRC letter of 3/14/83 to include a total flood Halon 1301 suppression system in the cable tunnel area. Hence the cable tunnel area of fire area 1-CV-3 includes a Halon 1301 system installed in accordance with NFPA 12A-1980. The following critical attributes of the consensus code were evaluated to ensure functionality and reliability.

Complies:

1. The available quantity calculations were confirmed to provide adequate concentration to meet NFPA 12A-1980.
2. The initial post installation tests were reviewed and confirmed that the Halon system provides an acceptable level of concentration.
4. The system was confirmed to actuate automatically and indicate both detection and actuation in the main control room. This is tested periodically.
5. The Halon 1301 suppression system was confirmed to have an emergency manual control station.
6. It was confirmed that the procedure requires verification that the main and reserve Halon cylinders maintain at least the minimum amount of Halon required.
7. The pipes and fittings of the system were confirmed by drawings to be acceptable per NFPA 12A-1980.
8. It was confirmed that the annual periodic testing verifies manual, manual-electric, and automatic actuation. In addition, the Halon cylinders were confirmed to be tested for correct weight and pressure semi-annually.
9. The cable tunnel has no permanently installed ventilation provisions. There are no dampers to isolate. The entrance to this area is a hatch, which is normally closed unless the tunnel is being accessed by personnel.
10. The Halon control panel was confirmed to have primary and secondary power supplies.
11. Appropriate fire watches are established within 1 hour by procedure ½-ADM-1900 when the system is discovered degraded or inoperable.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Complies with Clarification

3. PRA only credits manual actuation of the system for NFPA 805, the system is acceptable.

#### Licensing Actions

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

#### References

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
- 1OM-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
- 1OST-33.22, Rev. 8, "Halon Storage Cylinder Operability Test for Cable Tunnel CV-3 and Process Equipment Area"  
- 1OST-33.23A, Rev. 4, "Process Equipment Area and Cable Tunnel CV-3 Halon Instrumentation Test"  
- 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
  
- 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
- 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
- 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
- 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
- CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

#### Supporting EEEEs

10080-DMC-0054, Eval#IV-3 R2 A4  
FPPCE 11-027 Rev.0

- 1DBD-33B, Rev. 14, "Fire Protection System"  
  
- 1OST-33.15A, Rev. 19, "Fire Extinguisher Monthly Inspection"  
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"  
  
- 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
- 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
- 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
- 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
  
- 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
- DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### Open Items and VFDRs

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

### **Compliance Basis:**

Fire Area 1-CV-3 is protected by an automatic total flooding Halon 1301 system. Fire detection is provided by ionization smoke detectors in the area. The gaseous fire suppression systems are controlled by a local control panel with a local alarm, and that alarms to the main control room for notification of a fire condition, fire panel trouble, or Halon discharge.

### **Licensing Actions**

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

### **References**

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
 - 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
 - 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
 - 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
 - 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
 - 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
 - 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
 - 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
 - CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
 - NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"  
 - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

### **Supporting EEEEs**

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"  
 - 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
 - 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
 - 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
 - 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
 - 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
 - 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
 - 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
 - DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
 - NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies with Clarification

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

#### **Compliance Basis:**

The fire suppression for this area is a total flooding Halon 1301 system. Access to 1-CV-3 is through a locking, rapid entry access hatch located in the yard, south of the BVPS-2 control room. The area is not normally occupied, and the means of access is locked during plant operation and access is controlled by control room operations personnel. Fire Area CV-3, the cable tunnel, has no permanently installed ventilation provisions. The floor is a concrete slab, and the walls have been sealed to provide fire rated construction. During the post-modification discharge test the concentration was satisfactory. The access hatch is located at the top of the cable tunnel/vault and since the Halon and air mixture tunnel will then be considerably denser than the air in the outdoor area above, the loss rate to the outdoor area would not be significantly high.

This area is not located in the radiological controlled area so it is not necessary to consider confinement of radioactive contaminants.

#### Licensing Actions

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

#### References

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"
- 1OM-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"
- 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"
- 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"
- 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "
- 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"

#### Supporting EEEEs

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"
- 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"
- 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"
- 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |  |  |
|--|--|
| - CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3" | - DCP-553, Rev. 0, "Halon System for Cable Tunnel"         |
| - NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"                           | - NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980" |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                                 |  |

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

### **Compliance Basis:**

Fire Area 1-CV-3 is provided with a total flooding Halon 1301 extinguishing system, and does not have a backup gaseous suppression system. Backup fire suppression is provided by fire hose stations from an outdoor fire hydrant and a portable extinguisher. The Halon suppression system has a reserve supply cylinder but this is not required to be single failure proof because it does not represent the backup capability for the area.

### **Licensing Actions**

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

### **References**

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
 - 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
 - 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
 - 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
  
 - 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
 - 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
 - 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
 - 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
 - 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
 - CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
 - NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"  
 - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

### **Supporting EEEs**

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"  
 - 10ST-33.15A, Rev. 19, "Fire Extinguisher Monthly Inspection"  
 - 10ST-33.5, Rev. 19, "Fire Protection System Inspection Test"  
  
 - 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
 - 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
 - 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
 - 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
 - 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
  
 - 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
 - DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
  
 - NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-CV-3

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.5 - Disarming automatic system

#### Compliance Basis:

The automatic Halon 1301 fire suppression system for 1-CV-3 includes a key operated Discharge Lockout Switch. The Discharge Lockout Switch will give a trouble alarm in the control room. There is also an abort "dead man" switch for the subject Halon system located in the cable tunnel, but it does not override manual operation. Since the subject switches are located in the cable tunnel, which is kept locked and are designed as described, compliance with this section of NFPA 805 is assured.

#### Licensing Actions

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

#### References

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"
- 1OM-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"
- 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"
- 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"
- 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"
- 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "
- 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"
- CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"
- NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### Supporting EEEs

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"
- 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"
- 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"
- 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"
- 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"
- DCP-553, Rev. 0, "Halon System for Cable Tunnel"
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

### Fire Protection Features Transition Report

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

#### **Compliance Basis:**

The fire suppression for 1-CV-3 is a total flooding Halon 1301 system. Access to 1-CV-3 is through a locking, rapid entry access hatch located in the yard, south of the BVPS-2 control room. The area is not normally occupied; therefore, the subject Halon 1301 system does not represent a personnel concern, because it does not cause an immediate threat-to-life concern.

#### **Licensing Actions**

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

#### **References**

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
 - 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
 - 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
 - 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
 - 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
 - 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
 - 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
 - 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
 - CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
 - NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"  
 - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### **Supporting EEEEs**

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"  
 - 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
 - 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
 - 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
 - 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
 - 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
 - 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
 - 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
 - DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
 - NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

Fire Area 1-CV-3 is protected by an automatic total flooding Halon 1301 system. The system is equipped with an audible pre-discharge alarm and discharge delay equal to approximately 20 seconds. This Halon 1301 system does not represent a personnel concern, because it does not create an immediate threat-to-life concern since its maximum Halon concentration is less than the 10% consensus code requirement. This is a Halon system and not a carbon dioxide system; therefore it does not require an odorizer.

**Licensing Actions**

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

**References**

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
  
- 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
  
- 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
- 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
- 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
- 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
  
- CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
- NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Supporting EEEs**

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"  
  
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
- 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
- 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
- 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
- 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
  
- 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
- DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
  
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-3**

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

### **Compliance Basis:**

Fire area 1-CV-3 is protected by an automatic total flooding Halon 1301 fire suppression system. However, provisions have been made to prevent actuation of the system during certain maintenance and testing periods. The local system control panel interfaces with a local key operated Discharge Lockout Switch that can block automatic operation. Additional protection for personnel is provided by disabling the pneumatic actuators for the Halon cylinders.

### **Licensing Actions**

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

### **Supporting EEEs**

- None

### **References**

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
 - 1OM-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
 - 1OST-33.23A, Rev. 4, "Process Equipment Area and Cable Tunnel CV-3 Halon Instrumentation Test"  
 - 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
 - 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
 - 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
 - 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
 - 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
 - 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
 - DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
 - NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

- 1DBD-33B, Rev. 14, "Fire Protection System"  
 - 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
 - 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
 - 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
 - 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
 - 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
 - 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
 - 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
 - CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
 - NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"  
 - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-CV-3**

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

### **Compliance Basis:**

Fire area 1-CV-3 is protected by an automatic total flooding Halon 1301 fire suppression system. NFPA 12A-1980 states that the liquid phase vaporizes rapidly when mixed with air and thus limit the hazard to the immediate vicinity of the discharge point. The discharge nozzles are located within a few feet of the ceiling which would minimize any impingement effects within the room.

### **Licensing Actions**

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

### **References**

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
 - 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
 - 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
 - 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
 - 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
 - 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
 - 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
 - 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
 - CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
 - NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"  
 - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

### **Supporting EEEEs**

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"  
 - 10ST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
 - 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
 - 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
 - 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
 - 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
 - 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
 - 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
 - DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
 - NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-CV-3

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.10 - Corrosive characteristics

#### Compliance Basis:

Area 1-CV-3 is provided with an automatically actuated Halon 1301 extinguishing system. The system is automatically actuated by the ionization fire detectors. The Halon 1301 liquid discharge time is approximately 10 seconds. There is a 22 second discharge delay for any personnel to exit the area. The fire detectors would sense the fire condition in its early stages and the quick application will extinguish the fire and keep the Halon decomposition to a minimum since decomposition increases over 900°F.

#### Licensing Actions

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

#### References

- 01.080-0453, Rev. C, "Plan and Sections 720'-0" Cable Tunnel "Halon" Fire Protection System"  
- 10M-33.4.AF, Rev. 0, "Halon Fire protection Systems Operation"  
  
- 2BVS-920, Rev. 14, "Field Fabrication and Erection of Piping"  
  
- 8700-10.001-0594, Rev. 1, "CV-3 Tunnel Area Halon Fire Protection System"  
- 8700-10.001-0621, Rev. G, "Halon 1301 Fire Protection Systems Instruction Manual"  
- 8700-LSK-20-8B, Sht. 2, Rev. 1, "Logic Diagram Fire protection Cable Tunnel Area "  
- 8700-RE-18BN, Rev. 3, "Wiring Diagram Fire Protection Panel (PNL-FE-CV3)"  
- 8700-RE-7AN, Rev. 10, "Wiring Diagram Annunciators"  
- CR 07-23716, "(BV-C-07-06-04) Questions Concerning Unit 1 Halon Acceptance Testing for CV-3"  
- NFPA 12A, "Halogenated Extinguishing Agent System Halon 1301 1977"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### Supporting EEEs

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"  
  
- 1OST-33.23, Rev. 1, "Halon System Actuation and Sys. Integrity For Cable Tunnel CV-3 and Process Equip. Area"  
- 8700-10.001-0593, Rev. A, "CV-3 Tunnel Area Halon 1301 Fire Protection System"  
- 8700-10.001-0597, Rev. C, "CV-3 Tunnel Area Halon 1301 Fire Protection Sys Misc Elec Equip"  
- 8700-LSK-20-8A, Sht. 1, Rev. 1, "Logic Diagram Fire Protection Cable Tunnel Area Zone 1 and 2"  
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"  
- 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"  
  
- 8700-RM-433-4, Rev. 5, "VOND Fire Protection-Halon and CO2"  
- DCP-553, Rev. 0, "Halon System for Cable Tunnel"  
  
- NFPA 12A, "Halon 1301 Fire Extinguishing Systems - 1980"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings is a 3 hour fire rating. Barriers of this fire compartment range from 12 to 24 inches of concrete.

The fire barriers are periodically inspected.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0008Q, Rev. 10, "Plan @ EL 707'-6" & 725'-6" Control Room Extension"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0008S, Sht. 1, Rev. 10, "Sections & Details Control Room Extension"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

The only entrance to this area is a locking, rapid entry access hatch outside the Unit 2 control room in the yard. The installed hatch is aluminum.

Fire Dampers:

A review of ventilation system drawings confirms that there is no ventilation for this area. Therefore, there are no applicable ventilation penetrations for this area that would need to be equipped with a fire rated damper.

**Licensing Actions**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 77-04-29, "BV1, Fire Protection Program Review APCSB 9.5-1 Appendix A"
- 80-10-30, "BV1 Fire Prot. System Info. - Response to RAI pertaining to fire prot. system mods"
- 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

**Supporting EEEs**

- None

- 10080-DMC-0054, Rev. 2, Add. 3, "Analysis of Untested Seal Designs"
- 1PFP-SRVB-725-CABLE-TUNNEL, Rev. 0, "Cable Tunnel CV-3 Fire Area CV-3"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-10.001-0671, Rev. C, "Relay Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0722 , Rev. E, "Cable Tunnel EL. 720'-0" Data Sheet"
- 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |  |  |
|--|--|
| - 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"           | - 8700-B-084, Rev. 12, "Fire Hazards Analysis"                                   |
| - 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"                                  | - 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."                 |
| - 8700-RC-0008Q, Rev. 10, "Plan @ EL 707'-6" & 725'-6" Control Room Extension"                   | - 8700-RC-0008S, Sht. 1, Rev. 10, "Sections & Details Control Room Extension"    |
| - CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco" | - TER 10139, Rev. 0, "G.L. 86-10 Evaluation; Assign Seal Number and Seal Method" |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                                   |  |

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-CV-3

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- None

##### Supporting EEEEs

10080-DMC-0054, Eval#IV-3 R2 A4  
FPPCE 13-011 Rev.0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"

- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0671, Rev. C, "Relay Room El. 713'-6 3HR Fire Rated Floor and Walls"

- 8700-10.001-0722, Rev. E, "Cable Tunnel EL. 720'-0" Data Sheet"

- 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"

##### Open Items and VFDRs

##### Item Number

BV1-0714

**Item Title:** Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-CV-3

**Compliance Statement:** *Complies with Clarification*  
*Complies with use of EEEE*

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:** 3.11.5 - ERFBS

**Compliance Basis:**

Complies with Clarification:

Fire Compartment 1-CV-3 has no ERFBS. However, cable trays containing non-IEEE Std. 383 qualified cables are provided with metal covers (top and bottom). ALL exposed portions of cables that enter or exit these trays were wrapped with protective wrap, providing equivalent protection to those cables being within a conduit.

Complies with use of EEEE:

An engineering evaluation determined that the present configuration of cable trays within 1-CV-3 is acceptable and is consistent with the NRC-approved exemption for 1-CV-3.

**Licensing Actions**

- 11.05 Cable Tunnel (1-CV-3) - Lack of 20 ft. Separation and Automatic Suppression (III.G.2 criteria)

**Supporting EEEEs**

FPPCE 11-027 Rev.0

**References**

- 82-06-30-1, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12"  
- 8700-RE-0034AP, Rev. 9, "Cable Tray Designations - Electrical Tunnel El. 720ft-0in"

- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

The diesel generator cubicle, 1-DG-1, fire detection consists of area ionization coverage. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

1. Confirmed the detectors are mounted on the ceiling based on documentation.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
3. Confirmed that smoke detector spacing is acceptable.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

- None

**Supporting EEEs**

FPPCE 13-011 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RE-0064JQ, Rev. 1, "Cable Block Diagram - Fire Detection DGP-3, 4, & 5"
- 10ST-33.16B, Rev. 2, "Early Warning Smoke Det. Instr. Test Diesel Gen. Rms Cable Vaults and Cable Mezzanine"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** ~ 1-DG-1

**Compliance Statement:** Complies by Previous Approval

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.1 - NFPA Standards

#### **Compliance Basis:**

The total flooding CO2 system was specified to conform to the requirements of NFPA No. 12-1973. Initial actuation is by temperature or it can be actuated manually. A second actuation can be performed manually. The following critical attributes of the consensus code were evaluated to ensure functionality and reliability;

1. Calculations were confirmed to ensure adequate flow rate and design concentrations for suppression of the most limiting fire hazard.
2. TER 13758 has a copy of the initial post-installation tests for 1-DG-1. Test results for 1-DG-1 show that a concentration of 34% in one minute was achieved in the area and that the concentration as measured in various elevations in the area was maintained above 34% for between 2.5-7 minutes.
3. The review concluded there is an audible pre-discharge alarm and a 30-second time delay before discharge begins.
4. A review of the drawings concluded the installation of 2 heat detectors devices and that upon actuation will send a signal to annunciate an alarm to the main control room
5. It was confirmed that for emergency manual control there is a break glass station that has a mechanical lever that can be moved which will utilize CO2 pressure to open the local valve and manually discharge CO2 to the area upon a loss of power to the main control cabinet. There is a similar break glass station located near the 10-ton CO2 tank that can be operated to open the master valve.
6. It was confirmed that the pressure and level of the 10-ton CO2 tank are recorded periodically.
7. The CO2 tank level and pressure alarms were confirmed to send alarm signals to the main control room.
8. A review of the purchase specification confirmed that all piping between the master and selector valves and open end piping is steel and conforms to ASTM A53, which is acceptable to the consensus code.
9. The administrative test procedure confirms that the actual pre-discharge time is acceptable, and that the manual actuation by a pushbutton completes the entire discharge cycle in the acceptable time frame.
10. The dampers are inspected to ensure that they trip when the CO2 discharge occurs and are also confirmed operable by a visual inspection. TER 10497 documented the removal of automatic closure chains and capping of pilot piping in the CO2 system for fire doors. The basis for the removal states that

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

### Fire Protection Features Transition Report

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

administratively, station personnel shall ensure that fire doors are kept closed, unblocked, or continuously guarded except when opened for passage into and out of an area.

11. According to Section 262 of NFPA 12-1973 edition, porosity and leakages such as at doors, windows, and dampers, though not readily apparent or easily calculated, have been found to provide sufficient relief for the normal carbon dioxide flooding systems without need for additional venting.

12. The CO2 panels were confirmed to have primary and secondary power supplies.

13. Appropriate fire watches are established by procedure when the system is discovered degraded or inoperable.

#### **Licensing Actions**

- None

#### **Supporting EEEs**

FPPCE 13-011 Rev.0

#### **References**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>- "Fire Protection Handbook, Sixteenth Edition"</li> <li>- 1DBD-33B, Rev. 14, "Fire Protection System"</li> <li>- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"</li> <li>- 1OST-33.9, Rev. 8, "CO2 Fire Protection System Inspection Test"</li> <li>- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"</li> <li>- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"</li> <li>- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"</li> <li>- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"</li> <li>- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"</li> <li>- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"</li> <li>- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"</li> <li>- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "</li> <li>- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"</li> <li>- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"</li> <li>- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"</li> <li>- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"</li> </ul> | <ul style="list-style-type: none"> <li>- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"</li> <li>- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"</li> <li>- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"</li> <li>- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"</li> <li>- 8700-B-084, Rev. 12, "Fire Hazards Analysis"</li> <li>- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"</li> <li>- 8700-RE-0001V, Rev. 31, "25V DC One Line Diagram"</li> <li>- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"</li> <li>- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"</li> <li>- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units &amp; Terminal Boxes"</li> <li>- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"</li> <li>- 8700-RE-21QS, Rev. 19, "Building Service Panel Ann A11 Window Arrangement"</li> <li>- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"</li> <li>- FL-17727, Rev. 0, "Cardox Calculation"</li> <li>- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"</li> <li>- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping &amp; Chain Removal for CO2 Actuated Door Releases"</li> </ul> |
|--|---|

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-DG-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

#### **Compliance Basis:**

The CO2 system for the 1-DG-1 fire area is immediately controlled by a local fire protection panel that will alarm annunciators in the control room for a CO2 discharge, a fire condition, or upon a system trouble condition.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"

#### Supporting EEEEs

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-1

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

According to Section 26 of NFPA 12-1973, porosity and leakages such as at doors, windows, and dampers, though not readily apparent or easily calculated, have been found to provide sufficient relief for the normal carbon dioxide flooding systems without the need for additional venting. Therefore, 1-DG-1 is acceptable without additional vents. This area is not a radiologically controlled area.

**Licensing Actions**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

**Supporting EEEs**

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-DG-1**

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

### **Compliance Basis:**

Backup suppression capability consists of portable extinguishers located in each area and fire hydrants nearby, and water coverage utilizing yard fire hydrants. The area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability.

### **Licensing Actions**

- None

### **Supporting EEEEs**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No DPR-66"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |  |   |
|--|---|
| - SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"               | - TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases" |
| - TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration" | - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                                    |

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-DG-1

**Compliance Statement:** Complies with Clarification

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

#### **Compliance Basis:**

An electrical lock out switch is located within the EDG room, which is locked and requires specific security access authorization to enter. Upon lockout of the CO2 system an annunciator will alarm on the Building Service Panel in the main control. The lock out annunciator alarm feature is tested periodically.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-1

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

### **Compliance Basis:**

This area is not normally occupied by personnel. IT is located away from any interior transient pathway in the station, ensuring that entry to the area is only to perform a specific task.

### **Licensing Actions**

- None

### **Supporting EEEs**

- None

### **References**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>- "Fire Protection Handbook, Sixteenth Edition"</li> <li>- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"</li> <li>- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"</li> <li>- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"</li> <li>- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"</li> <li>- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"</li> <li>- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"</li> <li>- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"</li> <li>- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"</li> <li>- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"</li> <li>- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "</li> <li>- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"</li> <li>- FL-17727, Rev. 0, "Cardox Calculation"</li> <li>- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"</li> </ul> | <ul style="list-style-type: none"> <li>- 1DBD-33B, Rev. 14, "Fire Protection System"</li> <li>- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"</li> <li>- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"</li> <li>- 8700-B-084, Rev. 12, "Fire Hazards Analysis"</li> <li>- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"</li> <li>- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"</li> <li>- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"</li> <li>- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"</li> <li>- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units &amp; Terminal Boxes"</li> <li>- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"</li> <li>- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"</li> <li>- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"</li> <li>- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"</li> <li>- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"</li> </ul> |
|--|--|

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-DG-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.7 - Audible alarm

#### Compliance Basis:

The 1-DG-1 CO2 system has an audible pre-discharge alarm in the form of a horn with a 30-second pre-discharge time, and the system contains an odorizer.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"

#### Supporting EEEEs

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-DG-1

**Compliance Statement:** Will Comply with the Use of Commitment

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

#### **Compliance Basis:**

The 1DG-1 area carbon dioxide system has an electrical lock-out switch. Manually placing this switch in the abnormal, or off positions, prevents the system from being actuated electrically. It is common to lockout the system in this fashion when a significant amount of work is being done in the area. Positive mechanical means to lock-out the subject carbon dioxide system can be accomplished by closing the CO2 supply tank discharge manual valve. However, this valve is not normally used for this purpose because it isolates the tank from all of the carbon dioxide systems supplied from the tank, resulting in all these systems becoming inoperable. This arrangement is not in compliance with NFPA 805. LAR Att. S tracks the plant commitment to make modification to provide positive mechanical means to lockout the total flooding carbon dioxide systems during work in automatic CO2 protected space.

#### Licensing Actions

- None

#### Supporting EEEs

- None

#### References

- 1OST-36.1, Rev. 58, "Diesel Generator No. 1 Monthly Test"  
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"

- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

#### Open Items and VFDRs

**VFDR Number**      BV1-0746      CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805 section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

#### **Disposition**

This VFDR will be corrected by a plant modification.



# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-DG-1

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

### **Compliance Basis:**

.The nozzles are essentially located directly 6 to 8 feet above the diesel generator; therefore, this arrangement minimizes any impingement or thermal effects on the diesel/generator components.

### **Licensing Actions**

- None

### **Supporting EEEEs**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-DG-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

#### **Compliance Basis:**

Carbon dioxide suppression systems are non-corrosive, non-damaging, and leave no residue to clean up after the fire, and it will not conduct electricity and can therefore be used on live electrical hazards. In summary, carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABB, Rev. 0, "Diesel Gen Bldg A Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-18U, Sht. 1, Rev. 7, "CO2 Fire Protection Diag. Storage Units & Terminal Boxes"
- 8700-RE-21BX, Sht. 1, Rev. 8, "Elem Diag Diesel Gen No. 1, Auxiliaries"
- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

#### Supporting EEEs

- None

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammdment No. 18 to Facility Operating License No DPR-66"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BR, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1A"
- 8700-RE-1V, Sht. 1, Rev. 27, "125V DC One Line Diagram"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1A1, Rev. 1, "Setpoint Document for TD-1FE-1A1"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- SPD-TD-1FE-1A2, Rev. 1, "Setpoint Document for TD-1FE-1A2"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 3 hour fire rating. Barriers for this fire compartment range from 12 to 48 inches of concrete.

The fire barriers are periodically inspected.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 81-06-02, "NRC Inspection 50-334/81-11"
- 8700-10.001-0702, Rev. H, "Diesel Generators 3 HR Fire Rated Floor and Walls (Data Sheet)"
- 8700-RA-0011A, Rev. 12, "Floor & Roof Plans Fuel & Diesel Gen Bldgs"
- 8700-RB-0027A, Rev. 9, "Building Services Diesel Generator Buildings"
- 8700-RC-0030B, Sht. 2, Rev. 7, "Diesel Generator Building Concrete"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- 8700-10.001-0701, Rev. F, "Diesel Generators 3 HR Fire Rated Floor and Walls"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0030A, Sht. 1, Rev. 11, "Diesel Generator Building Concrete "
- 8700-RC-0030C, Sht. 3, Rev. 10, "Diesel Generator Building Concrete"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-DG-1

**Compliance Statement:** Complies by Previous Approval  
Complies with Clarification

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

##### Fire Doors:

Fire doors G35-4A and G35-4B between DG-1 and DG-2 are 3-hour fire rated.

Door G35-3 to the outside yard is not fire rated. No fire hazards exist in the area of the exterior nonfire rated doors.

##### Fire Dampers:

There are no ventilation penetrations between the two rooms, and the only openings in the room that are not fire rated are the intake and exhaust ventilation dampers and the muffler exhaust opening. Ventilation dampers 1VS-D-22-2A and 1VS-D-22-2B are above the front door to the outside, and 1VS-D-22-1A is associated with the exhaust fan 1VS-F-22A which exhausts through the ceiling.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"

- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 81-06-02, "NRC Inspection 50-334/81-11"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0702, Rev. H, "Diesel Generators 3 HR Fire Rated Floor and Walls (Data Sheet)"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0030A, Sht. 1, Rev. 11, "Diesel Generator Building Concrete "
- 8700-RC-0030C, Sht. 3, Rev. 10, "Diesel Generator Building Concrete"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0701, Rev. F, "Diesel Generators 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0011A, Rev. 12, "Floor & Roof Plans Fuel & Diesel Gen Bldgs"
- 8700-RB-0027A, Rev. 9, "Building Services Diesel Generator Buildings"
- 8700-RC-0030B, Sht. 2, Rev. 7, "Diesel Generator Building Concrete"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-DG-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- None

##### Supporting EEEEs

FPPCE 13-011 Rev.0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0702, Rev. H, "Diesel Generators 3 HR Fire Rated Floor and Walls (Data Sheet)"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0701, Rev. F, "Diesel Generators 3 HR Fire Rated Floor and Walls"

##### Open Items and VFDRs

##### Item Number

BV1-0714

**Item Title:** Complete Penetration Seal Database



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-DG-2**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**       3.8.2 - Detection

**Compliance Basis:**

Complies

The diesel generator cubicle, 1-DG-2, fire detection consists of area ionization coverage. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10 with the exception of item 3.

1. Confirmed the detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies with use of EEEE

3. Smoke detection spacing in general does not exceed the allowable listed spacing as modified for the type of ceiling coverage. An EEEE evaluation concluded that

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**Beaver Valley Unit 1**

detectors DI-99 and DI-101 have acceptable spacing.

**Licensing Actions**

- None

**Supporting EEEs**

FPPCE 12-121 Rev.0

FPPCE 13-011 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 8700-RE-0064JQ, Rev. 1, "Cable Block Diagram - Fire Detection DGP-3, 4, & 5"

- 10ST-33.16B, Rev. 2, "Early Warning Smoke Det. Instr. Test Diesel Gen. Rms Cable Vaults and Cable Mezzanine"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.1 - NFPA Standards

**Compliance Basis:**

The total flooding CO2 system was specified to conform to the requirements of NFPA No. 12-1973. Initial actuation is by temperature or it can be actuated manually. A second actuation can be performed manually. The following critical attributes of the consensus code were evaluated to ensure functionality and reliability;

1. Calculations were confirmed to ensure adequate flow rate and design concentrations for suppression of the most limiting fire hazard.
2. TER 13758 has a copy of the initial post-installation tests for DG-2. Test results for DG-2 show that a concentration of 34% in one minute was achieved in the area and that the concentration as measured in various elevations in the area was maintained above 34% for between 2.5-7 minutes.
3. The review concluded there is an audible pre-discharge alarm and a 30-second time delay before discharge begins.
4. A review of the drawings concluded the installation of 2 heat detectors devices and that upon actuation will send a signal to annunciate an alarm to the main control room
5. It was confirmed that for emergency manual control there is a break glass station that has a mechanical lever that can be moved which will utilize CO2 pressure to open the local valve and manually discharge CO2 to the area upon a loss of power to the main control cabinet. There is a similar break glass station located near the 10-ton CO2 tank that can be operated to open the master valve.
6. It was confirmed that the pressure and level of the 10-ton CO2 tank are recorded periodically.
7. The CO2 tank level and pressure alarms were confirmed to send alarm signals to the main control room.
8. A review of the purchase specification confirmed that all piping between the master and selector valves and open end piping is steel and conforms to ASTM A53, which is acceptable to the consensus code.
9. The administrative test procedure confirms that the actual pre-discharge time is acceptable, and that the manual actuation by a pushbutton completes the entire discharge cycle in the acceptable time frame.
10. The dampers are inspected to ensure that they trip when the CO2 discharge occurs and are also confirmed operable by a visual inspection. TER 10497 documented the removal of automatic closure chains and capping of pilot piping in the CO2 system for fire doors. The basis for the removal states that administratively, station personnel shall ensure that fire doors are kept closed, unblocked, or continuously guarded except when opened for passage into and out of an area.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

11. According to Section 262 of NFPA 12-1973 edition, porosity and leakages such as at doors, windows, and dampers, though not readily apparent or easily calculated, have been found to provide sufficient relief for the normal carbon dioxide flooding systems without need for additional venting.

12. The CO2 panels were confirmed to have primary and secondary power supplies.

13. Appropriate fire watches are established by procedure when the system is discovered degraded or inoperable.

**Licensing Actions**

- None

**Supporting EEEEs**

FPPCE 13-011 Rev.0

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"
- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 1OST-33.9, Rev. 8, "CO2 Fire Protection System Inspection Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0001V, Rev. 31, "25V DC One Line Diagram"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-DG-2

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

#### **Compliance Basis:**

The CO2 system for the 1-DG-2 fire area is immediately controlled by a local fire protection panel that will alarm annunciators in the control room for a CO2 discharge, a fire condition, or upon a system trouble condition.

#### Licensing Actions

- None

#### References

- "Fire Protection Handbook, Sixteenth Edition"
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"

#### Supporting EEEEs

- None

- 10M-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies with Clarification

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

### **Compliance Basis:**

According to Section 26 of NFPA 12-1973, porosity and leakages such as at doors, windows, and dampers, though not readily apparent or easily calculated, have been found to provide sufficient relief for the normal carbon dioxide flooding systems without the need for additional venting. Therefore, DG-1 is acceptable without additional vents. This area is not a radiologically controlled area.

### **Licensing Actions**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"

### **Supporting EEEEs**

- None

- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

### **Compliance Basis:**

Backup suppression capability consists of portable extinguishers located in each area, and water coverage utilizing yard fire hydrants. The area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability.

### **Licensing Actions**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"

### **Supporting EEEEs**

- None

- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies with Clarification

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

### **Compliance Basis:**

An electrical lock out switch is located within the EDG room, which is locked and requires specific security access authorization to enter. Upon lockout of the CO2 system an annunciator will alarm on the Building Service Panel in the main control room. The lock out annunciator alarm feature is tested periodically.

### **Licensing Actions**

- None

### **Supporting EEEEs**

- None

### **References**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>- "Fire Protection Handbook, Sixteenth Edition"</li> <li>- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"</li> <li>- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"</li> <li>- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"</li> <li>- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"</li> <li>- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"</li> <li>- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"</li> <li>- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"</li> <li>- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "</li> <li>- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"</li> <li>- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"</li> <li>- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"</li> <li>- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"</li> </ul> | <ul style="list-style-type: none"> <li>- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"</li> <li>- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"</li> <li>- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"</li> <li>- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"</li> <li>- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"</li> <li>- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"</li> <li>- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"</li> <li>- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"</li> <li>- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "</li> <li>- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"</li> <li>- FL-17727, Rev. 0, "Cardox Calculation"</li> <li>- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"</li> <li>- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping &amp; Chain Removal for CO2 Actuated Door Releases"</li> </ul> |
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

This area is not normally occupied by personnel. It is located away from any interior transient pathway in the station, ensuring that entry to the area is only to perform a specific task.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"
- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

### **Compliance Basis:**

The 1-DG-2 CO2 system has an audible pre-discharge alarm in the form of a horn with a 30-second pre-discharge time, and the system contains an odorizer.

### **Licensing Actions**

- None

### **Supporting EEEs**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"
- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-DG-2

Compliance Statement: Will Comply with the Use of Commitment

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.8 - Lock out

#### Compliance Basis:

The 1-DG-2 area carbon dioxide system has an electrical lock-out switch. Manually placing this switch in the abnormal, or off positions, prevents the system from being actuated electrically. It is common to lockout the system in this fashion when a significant amount of work is being done in the area. Positive mechanical means to lock-out the subject carbon dioxide system can be accomplished by closing the CO2 supply tank discharge manual valve. However, this valve is not normally used for this purpose because it isolates the tank from all of the carbon dioxide systems supplied from the tank, resulting in all these systems becoming inoperable. This arrangement is not in compliance with NFPA 805. LAR Att. S tracks the plant commitment to make modification to provide positive mechanical means to lockout the total flooding carbon dioxide systems during work in automatic CO2 protected space.

#### Licensing Actions

- None

#### Supporting EEEs

- None

#### References

- 10ST-36.2, Rev. 58, "Diesel Generator No. 2 Monthly Test"

- 8700-RM-433-3, Rev. 11, "Valve OPER No Diagram - Fire Protection Water"

- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"

#### Open Items and VFDRs

VFDR Number      BV1-0746      CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805 section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

#### Disposition

This VFDR will be corrected by a plant modification.

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

### **Compliance Basis:**

The nozzles are essentially located directly 6 to 8 feet above the diesel generator; therefore, this arrangement minimizes any impingement or thermal effects on the diesel/generator components.

### **Licensing Actions**

- None

### **Supporting EEEEs**

- None

### **References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"
- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Carbon dioxide suppression systems are non-corrosive, non-damaging, and leaves no residue to clean up after the fire, and it will not conduct electricity and can therefore be used on live electrical hazards. In summary, carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment.

**Licensing Actions**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 8700-LSK-20-2C, Rev. 9, "CO2 Fire Protection System"
- 8700-RE-0021GX, Rev. 11, "Elementary Diagram Fire Protection (FP) SH60F8"
- 8700-RE-0021QU, Rev. 13, "Elementary Diagram Annunciator A11 SH. 2 of 4"
- 8700-RE-0051B, Rev. 4, "Conduit Plan Fire Protection System SH.2"
- 8700-RE-1AE, Rev. 18, "125V DC One Line Diagram"
- 8700-RE-21CC, Sht. 1, Rev. 4, "Elem Diag Diesel Gen. No. 2, Auxiliaries "
- 8700-RM-433-3 , Rev. 11, "Valve OPER No Diagram - Fire Protection Water"
- CR 01-0198, "Unit 1 EDG Fire Protection System Design Questions"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- SPD-TD-1FE-1B2, Rev. 1, "Setpoint Document for TD-1FE-1B2"

**Supporting EEEEs**

- None

- 1OM-33.4.ABC, Rev. 0, "Diesel Gen Bldg B Fire Prot System Trouble"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 8700-10.001-0382, Sht. 1, Rev. C, "Cardox System"
- 8700-RB-27A, Rev. 9, "Building Services Diesel Generator Building"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RE-18BS, Rev. 2, "CO2 Fire Protection Wiring Diagram Cabinet FE-CDL-1B"
- 8700-RE-21BZ, Sht. 2, Rev. 22, "Elem Diag Diesel Gen No. 2, Engine Controls"
- 8700-RE-21MP, Sht. 1, Rev. 4, "Elem Diag Ventilation Sys (VS) SH 14 of 29 Diesel Gen Bldg "
- BVS-487, Rev. 0, "Low Pressure Carbon Dioxide Fire Protection System"
- FL-17727, Rev. 0, "Cardox Calculation"
- SPD-TD-1FE-1B1, Rev. 1, "Setpoint Document for TD-1FE-1B1"
- TER 10497, Rev. 0, "Capping of CO2 Pilot Piping & Chain Removal for CO2 Actuated Door Releases"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- TER-13578, Rev. 0, Add. 0, "Diesel Generator Building CO2 Concentration"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-DG-2

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

#### **Compliance Basis:**

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 3 hour fire rating. Barriers of this fire compartment range from 12 to 48 inches of concrete.

The fire barriers are periodically inspected.

#### Licensing Actions

- None

#### Supporting EEEs

- None

#### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 81-06-02, "NRC Inspection 50-334/81-11"
- 8700-10.001-0702, Rev. H, "Diesel Generators 3 HR Fire Rated Floor and Walls (Data Sheet)"
- 8700-RA-0011A, Rev. 12, "Floor & Roof Plans Fuel & Diesel Gen Bldgs"
- 8700-RB-0027A, Rev. 9, "Building Services Diesel Generator Buildings"
- 8700-RC-0030B, Sht. 2, Rev. 7, "Diesel Generator Building Concrete"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- 8700-10.001-0701, Rev. F, "Diesel Generators 3 HR Fire Rated Floor and Walls"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0030A, Sht. 1, Rev. 11, "Diesel Generator Building Concrete "
- 8700-RC-0030C, Sht. 3, Rev. 10, "Diesel Generator Building Concrete"

#### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-DG-2

**Compliance Statement:** Complies by Previous Approval  
Complies with Clarification

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

##### Fire Doors:

Fire doors G35-4A and G35-4B between 1-DG-1 and 1-DG-2 are 3 hour fire rated.

Door G35-2 to the outside yard is not fire rated. No fire hazards exist in the area of the exterior non-fire rated doors.

##### Fire Dampers:

There are no ventilation penetrations between the two rooms, and the only openings in the room that are not fire rated are the intake and exhaust ventilation dampers and the muffler exhaust opening. Ventilation dampers 1VS-D-22-2C and 1VS-D-22-2D are above the front door to the outside, and 1VS-D-22-1B is associated with the exhaust fan 1VS-F-22B which exhausts through the ceiling. None of these dampers are between 1-DG-2 and another fire area.

#### Licensing Actions

- None

#### Supporting EEEs

- None

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

#### References

- 10ST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 81-06-02, "NRC Inspection 50-334/81-11"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0702, Rev. H, "Diesel Generators 3 HR Fire Rated Floor and Walls (Data Sheet)"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0030A, Sht. 1, Rev. 11, "Diesel Generator Building Concrete "
- 8700-RC-0030C, Sht. 3, Rev. 10, "Diesel Generator Building Concrete"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0701, Rev. F, "Diesel Generators 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0011A, Rev. 12, "Floor & Roof Plans Fuel & Diesel Gen Bldgs"
- 8700-RB-0027A, Rev. 9, "Building Services Diesel Generator Buildings"
- 8700-RC-0030B, Sht. 2, Rev. 7, "Diesel Generator Building Concrete"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-DG-2

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized. A penetration seal is to be modified.

**Licensing Actions**

- None

**Supporting EEEEs**

FPPCE 13-011 Rev.0

**References**

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0702, Rev. H, "Diesel Generators 3 HR Fire Rated Floor and Walls (Data Sheet)"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0701, Rev. F, "Diesel Generators 3 HR Fire Rated Floor and Walls"

**Open Items and VFDRs**

<b>Item Number</b>		<b>Item Title:</b>
BV1-0714		Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-ES-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**       3.8.2 - Detection

**Compliance Basis:**

Complies

The switchgear area, 1-ES-1, is provided with ionization smoke detectors and the two station emergency battery rooms located within the area are each provided with a heat detector. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10 with the exception of item 3.

1. Confirmed the detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies with use of EEEE

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

3. An EEEE has been performed to provide justification of detection spacing due to ceiling geometry and beams located within 1-ES-1.

### **Licensing Actions**

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

### **Supporting EEEs**

- FPPCE 12-093 Rev.0
- FPPCE 12-120 Rev.0
- FPPCE 13-008 Rev.0
- FPPCE 13-011 Rev.0

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- CR 07-13485, Rev. 0, "Triennial - Documentation of Code Compliance for Emergency Switchgear Fire Detectors"
- NFPA 72D, Rev. 1973, "Proprietary Protective Signaling Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 1OST-33.16F, Rev. 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RS-0005D, Rev. 10, "Mezzanine Floor Framing Service Building"
- DLC-08700-01.058-0344, Rev. A, "Automatic Fire and Smoke Detection Devices Installation and Technical Data"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

### **Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 1

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 1-ES-1

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

##### Compliance Basis:

Complies:

1. Drawings identify the minimum barrier thickness for the walls and floor for this area to be greater than 12 inches of concrete; therefore the walls and floor are considered to be greater than a 3 hour fire rating. The ceiling is 5 1/2 inches of concrete over metal deck construction. See discussion in Prior Approval.
2. Each fire barrier was confirmed to be inspected every 18 months per the Fire Rated Assembly Visual Inspection, 10ST-33.35.

Complies by prior approval:

Duquesne Light letter dated December 16, 1983, filed for additional exemptions from certain provisions of Section III.G of Appendix R to 10 CFR 50. Attachment III requests an exemption from III.G.2 for both emergency switchgear rooms (ES-1 and ES-2) because this area does not have a 3-hour barrier envelope due to the ceiling. NRC letter dated August 30, 1984 granted nine exemptions including one for ES-1 from III.G.2 since the ceiling does not provide a 3-hour barrier. Justification for the exemption included the fact that the combustible loading in the emergency switchgear room, if totally consumed, would correspond to an equivalent fire severity of approximately 25 minutes on the ASTM E-119 Standard Time-Temperature Curve, and smoke detection and manual fire suppression equipment are provided in the area. Based on that, the protection provided for the emergency switchgear room ceiling provides a level of fire protection equivalent to the technical requirements of Section III.G, and the exemption was granted.

Complies with use of EEEE

There is a gap in the ceiling along the west wall that interfaces with the compartment above. This gap is filled with a sealant and its evaluated configuration has been determined to be "adequate for the hazard."

#### Licensing Actions

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEs

FPPCE 06-021 Rev.1

#### References

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0683, Rev. E, "Emergency Switchgear Rooms 1 & 2 EL. 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-ES-1

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance task.

##### Fire Doors:

Fire door S13-8 between 1-ES-1 and 1-NS-1 is a 3-hour fire door.

Fire door S13-7 between 1-ES-1 and 1-ES-2 is a 3 hour fire door. Door S13-7 was identified as having an unlabeled structural channel frame. NRC letter dated December 4, 1986 granted exemptions based on the fire severity rating calculated for the area.

##### Fire Dampers:

Drawings identify ductwork and their associated fire dampers for the 1-ES-1 area. The drawings identify several fire dampers that are part of the boundary of the area with functional locations of 1VS-D-87A, 1VS-D-87B, 1VS-D-263, 1VS-D-266, 1VS-D-281, 1VS-D-282, and 1VS-D-283.

Dampers 1VS-D-263 and 1VS-D-266 were not replaced by either modification package but were evaluated by an engineering evaluation. The methodology used was found acceptable in NRC letter dated June 29, 1990.

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

### **Licensing Actions**

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1BVT 1.33.5, Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0683, Rev. E, "Emergency Switchgear Rooms 1 & 2 EL. 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2341, Rev. 1, "Basis for Exemption of Non-Qualified Fire Damper VS-D-263 and VS-D-266 "
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RB-0017G, Sht. 7, Rev. 11, "Vent and Air Cond EL 713'-6" Service Building"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- CR 05-07374, "Evaluate Fire Seal Acceptability"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- EM 30318, "NRC Inspection #83-69: Fire Dampers"

### **Supporting EEEEs**

- 8700-DMC-2341 R0 A0
- FPPCE 13-030 Rev.0
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OM-54.3.TURBINE1, Rev. 36, "Turbine Log Readings"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017L, Rev. 11, "Vent & Air Cond. EL. 725'-6" Service Building Sh. 11"
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- ECP 06-0147, Rev. 0, "Evaluation of Caulking in West Cable Mezzanine"
- FPPCE 06-021, Rev. 0, "Untested fire seal configuration between CS-1 and ES-1"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-ES-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

- FPPCE 12-093 Rev.0
- FPPCE 13-008 Rev.0
- FPPCE 13-011 Rev.0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0683, Rev. E, "Emergency Switchgear Rooms 1 & 2 EL. 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-ES-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

The switchgear area, 1-ES-2, is provided with ionization smoke detectors and the two station emergency battery rooms located within the area are each provided with a heat detector. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

1. Confirmed the detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage. Spacing is reduced because the ceiling has exposed beams.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEEs**

8700-DMC-2840 Eval.#1 R0 A2  
FPPCE 12-093 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-01.058-0344, Rev. 0, "Pyrotronics Detectors"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- CR 07-13485, Rev. 0, "Triennial - Documentation of Code Compliance for Emergency Switchgear Fire Detectors"
- NFPA 72D, Rev. 1973, "Proprietary Protective Signaling Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Supporting EEEEs**

FPPCE 13-008 Rev.0

- 10ST-33.16F, Rev. 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room"
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RS-0005D, Rev. 10, "Mezzanine Floor Framing Service Building"
- DLC-08700-01.058-0344, Rev. A, "Automatic Fire and Smoke Detection Devices Installation and Technical Data"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-ES-2**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Based on the ventilation duct penetrations fire ratings for this area and the fire severity loading, the fire barrier overall rating for this area is 1 hour even though the existing concrete construction of the walls, and floor shown on plant drawings represent a 3 hour fire rating. The ceiling is only rated for 1.5 hours.

Complies

The wall between the two switchgear rooms is 12 inches of reinforced concrete.

The north barrier of 1-ES-2 with 1-NS-1 is 24 inches of reinforced concrete.

The south barrier is 24 inches of reinforced concrete.

The east barrier with 1-MG-1 is 12 inches of reinforced concrete.

The floor is a minimum of 42 inches of reinforced concrete.

The fire barriers were confirmed to be periodically inspected for this fire area.

Complies by Previous Approval

The ceiling of 1-ES-2 is the floor of 1-CS-1 which has an equivalent fire rating to a 1.5-hour fire barrier. The ceiling is of concrete on metal deck supported by steel beams with fireproofing.

NRC letter dated August 30, 1984 granted an exemption from III.G.2 since the combustible loading in the emergency switchgear room, if totally consumed, would correspond to an equivalent fire severity of approximately 25 minutes on the ASTM E-119 Standard Time-Temperature Curve, and smoke detection and manual fire suppression equipment are provided in the area. Based on that, the protection provided for the emergency switchgear room ceiling provides a level of fire protection equivalent to the technical requirements of Section III.G, and the exemption was granted.

**Licensing Actions**

**Supporting EEEEs**

- None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

### **Licensing Actions**

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10M-54.3.TURBINE1, Rev. 36, "Turbine Log Readings"
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 8700-10.001-0683, Rev. E, "Emergency Switchgear Rooms 1 & 2 EL. 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-B-084, Rev. 12, Add. 1, "Fire Hazards Analysis"
- 8700-DMC-2653, Rev. 2, Add. 1, "Analysis of Untested Fire Seal Design"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017G, Sht. 7, Rev. 11, "Vent and Air Cond El 713'-6" Service Building"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"

### **Supporting EEEEs**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 10ST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0677, Rev. D, "Rod Position Room EL. 713'-6 3HR Fire Rated Walls and Floor"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2341, Rev. 1, "Basis for Exemption of Non-Qualified Fire Damper VS-D-263 and VS-D-266 "
- 8700-DMC-2840, Rev. 0, Add. 2, "Engineering Evaluation of Non-Rated Fire Assemblies"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0017L, Rev. 11, "Vent & Air Cond. El. 725'-6" Service Building Sh. 11"
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- EM 112046, "Missing Conduit Seals in DF Switchgear East Wall"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-ES-2

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

##### Fire Doors:

Fire door S13-9 between 1-ES-2 and 1-MG-1 is a 3 hour fire door.

Fire door S13-7 between 1-ES-1 and 1-ES-2 is a 3-hour fire door.

Fire door S13-7 between 1-ES-1 and 1-ES-2 is a 3 hour fire door. Door S13-7 was identified as having an unlabeled structural channel frame. NRC letter dated December 4, 1986 granted exemptions based on the fire severity rating calculated for the area.

##### Fire Dampers:

Drawings identify ductwork and their associated fire dampers for the 1-ES-2 area. The drawings identify 5 fire dampers that are part of the boundary of the area with functional locations of 1VS-D-263, 1VS-D-266, 1VS-D-267, 1VS-D-286, and 1VS-D-291.

Dampers 1VS-D-263 and 1VS-D-266 were not replaced by either modification package but were evaluated by an engineering evaluation. The methodology used was found acceptable in NRC letter dated June 29, 1990.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Licensing Actions

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1BVT 1.33.5, Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017G, Sht. 7, Rev. 11, "Vent and Air Cond El 713'-6" Service Building"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"

##### Supporting EEEs

- 8700-DMC-2341 R0 A0
- FPPCE 13-030 Rev.0

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OM-54.3.TURBINE1, Rev. 36, "Turbine Log Readings"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0677, Rev. D, "Rod Position Room EL. 713'-6 3HR Fire Rated Walls and Floor"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0683, Rev. E, "Emergency Switchgear Rooms 1 & 2 EL. 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2341, Rev. 1, "Basis for Exemption of Non-Qualified Fire Damper VS-D-263 and VS-D-266 "
- 8700-DMC-2840, Rev. 0, Add. 1, "Engineering Evaluation of Non-Rated Fire Assemblies"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0017L, Rev. 11, "Vent & Air Cond. El. 725'-6" Service Building Sh. 11"
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- EM 112046, "Missing Conduit Seals in DF Switchgear East Wall"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-ES-2

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- 11.09 Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 8700-10.001-0683, Rev. E, "Emergency Switchgear Rooms 1 & 2 EL. 713'-6" 3 HR. Fire Rated Floor and Walls"

##### Supporting EEEEs

- 8700-DMC-2653 Eval.#14 R2 A0
- 8700-DMC-2840 Eval.#1 R0 A2
- FPPCE 12-093 Rev.0
- FPPCE 13-008 Rev.0
- TER 10075 R0

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0677, Rev. D, "Rod Position Room EL. 713'-6 3HR Fire Rated Walls and Floor"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-FB-1**

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

### **Compliance Basis:**

Based on the ventilation duct penetrations fire ratings for this area and the fire severity loading, the fire barrier overall rating for this area is 1 hour even though the existing concrete construction of the walls, and floor shown on plant drawings exceed a 3 hour fire rating.

Barriers between 1-FB-1 and other compartments are 18 to 24 inches of reinforced concrete. The non-fire rated metal siding exterior walls, and concrete walls between the Fuel/Decon. Bldg. and other fire areas have been evaluated adequate for the low fire severity.

The fire barriers are periodically inspected.

### **Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

### **Supporting EEEs**

- None

### **References**

- |   |   |
|---|---|
| - 1/2-ADM-1900, Rev. 28, "Fire Protection Program"                                      | - 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"                 |
| - 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"                                  | - 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"                         |
| - 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"                                  | - 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"                          |
| - 8700-RC-0021A, Rev. 17, "Slab Plan El. 722'-6" & El. 725'-6" Cable Vault Area"        | - 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"                |
| - 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" & 756'-0", Cable Vault Area"           | - 8700-RC-0024A, Rev. 9, "Plan FDN. MAT EL. 717'-0" Auxiliary Building"         |
| - 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"     | - 8700-RC-0024H, Rev. 16, "Plan El 735'-6" - Outline, Auxiliary Building"       |
| - 8700-RC-0024K, Rev. 13, "Plan El. 752-6 - Outline Auxiliary Building"                 | - 8700-RC-0024M, Rev. 15, "plan El. 768-7 - Outline Auxiliary Building"         |
| - 8700-RC-0027A, Rev. 9, "Plans at EL 727'-4" & EL. 735'-6" Fuel Building"              | - 8700-RC-0027B, Rev. 12, "Plans at EL 768'-5 1/2" & EL 752'-5" Fuel Building " |
| - 8700-RC-0028A, Rev. 9, "Foundation Plan- Sections & Details Decontamination Building" | - 8700-RC-0030A, Sht. 1, Rev. 11, "Diesel Generator Building Concrete "         |
| - 8700-RC-0030B, Sht. 2, Rev. 7, "Diesel Generator Building Concrete"                   | - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                  |

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-FB-1

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies by Prior Approval

##### Fire Doors

Fire door A68-2 between 1-FB-1 and 1-PA-1A is a 3 hour fire rated door. Fire doors A35-6 and A35-7 between the Aux Building and 1-FB-1 are 1.5 hour fire rated doors. All other doors to the outside or internal to 1-FB-1 are not fire rated.

Door A68-2 was identified as having a security modification of a magnetic alarm switch on the door face and frame, and door A35-6 was identified as having conduit penetrating through the frame. NRC letter dated December 4, 1986 granted exemptions based on the fire severity rating calculated for the area.

Fire doors were confirmed to be inspected periodically by administrative procedures.

##### Fire Dampers

Drawings identify that the only duct penetrations between the fuel building and another fire area are between FB-1 and the Aux Building. The drawings identify dampers 1VS-D-188, 1VS-D-189, 1VS-D-190, and 1VS-D-191.

Fire dampers were confirmed to be inspected periodically by administrative procedures.

Complies with Use of EEEE

##### Fire Doors

An 86-10 evaluation of the two 1.5-hour doors, A35-6 and A35-7, between FB-1 and the Aux Building concluded that the "as-found" door A35-7 in conjunction with actual fire loading of less than 1 hour, and second door in series on the other side of the stairwell, will withstand the hazards associated with the area for which it bounds. Specifically, the 1.5-hour rated fire doors will serve their intended fire barrier functions without the need to upgrade the doors to 3-hour rated fire doors.

##### Fire Dampers

An engineering evaluation found the ductwork to have a fire resistance rating equivalent to one hour.



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

8700-DMC-1484 R0 A1  
8700-DMC-2345 R0 A0  
FPPCE 12-024 Rev.0 Part C

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"
- 8700-RB-0008H, Sht. 8, Rev. 16, "Air Cooling, Heating & Purging Auxiliary Building EL 768'-7" "
- 8700-RB-0022B, Sht. 2, Rev. 8, "Ventilation Fuel & Decontamination Building"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RA-0011A, Rev. 12, "Floor & Roof Plans Fuel & Diesel Gen Bldgs"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"
- 8700-RB-0022A, Sht. 1, Rev. 8, "Ventilation Fuel & Decontamination Building"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-FB-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

FPPCE 12-088 Rev.0

FPPCE 13-010 Rev.0

FPPCE 13-011 Rev.0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0700, Rev. D, "P.A.B. South Wall Penetrations All Elevations Data Sheet"

- 8700-10.001-0702, Rev. H, "Diesel Generators 3 HR Fire Rated Floor and Walls (Data Sheet)"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-01.035-0173, Rev. E, "Blowdown Room and Airlock EL. 767'-6" - EL. 768'-6" 3 HR. Fire Rated Walls & Floors"

- 8700-10.001-0701, Rev. F, "Diesel Generators 3 HR Fire Rated Floor and Walls"

- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"

##### Open Items and VFDRs

##### Item Number

BV1-0714

**Item Title:** Complete Penetration Seal Database

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-MG-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

#### Compliance Basis:

The Motor Generator Room fire compartment is 1-MG-1, fire detection consists of area ionization coverage. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10.

1. Confirmed the detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

#### Licensing Actions

- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEs

FPPCE 12-124 Rev.0  
FPPCE 13-008 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0007G, Rev. 11, "Floor Slab El. 725'-6", Service Building"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RS-0005D, Rev. 10, "Mezzanine Floor Framing Service Building"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16F, Rev. 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-MG-1**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

The walls and floor are depicted on plant drawings as greater than 12 inches of concrete; therefore they meet the criteria of a 3 hour fire rating. The ceiling is only rated for 1.5 hours based on prior approval.

The fire barriers were confirmed to be periodically inspected for this fire area.

Complies by Prior Approval

The ceiling of 1-MG-1 is the floor of 1-CS-1. The 1-CS-1 floor prior approved as equivalent to a 1.5-hour rated fire barrier. The configuration of the ceiling is 4 inches of concrete over 1 i/2 inch metal deck and supported by steel beams with fireproofing.

The August 30, 1984 letter approve the exemption for the 1 1/2-hour rated floor of 1-CS-1, but does not list 1-MG-1 as an interfacing compartment. There is a clarification in Attachment T to include the interface between 1-CS-1 and 1-MG-1.

**Licensing Actions**

- 11.10 Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"

**Supporting EEEEs**

- None

- 77-04-29, "BV1, Fire Protection Program Review APCSB 9.5-1 Appendix A"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-B-084, Rev. 12, Add. 1, "Fire Hazards Analysis"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RC-0008F, Rev. 10, "Sections, Service Building"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-MG-1**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies by Prior Approval

Fire Doors:

Fire doors are 3 hour fire rated and were confirmed to be inspected periodically.

Door S13-10 was identified as having an unlabeled pressed metal frame. NRC letter dated December 4, 1986 granted exemptions based on the fire severity rated calculated for the area.

Complies

Fire Dampers:

Drawings identify ductwork and their associated fire dampers for the 1-MG-1 area. The drawings identify two fire dampers that are part of the boundary of the area with a 3 hour UL listed fire rating and were confirmed to be inspected periodically.

**Licensing Actions**

- 11.10 Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

FPPCE 13-030 Rev.0

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 85-01-14, "Appendix R - Additional Exemption Requests"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |   |   |
|---|---|
| - 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)" | - 8700-10.001-1019, Rev. A, "Fire Damper VS-D-268 Installation & Fabrication Details" |
| - 8700-10.001-1031, Rev. A, "Fire Damper VS-D-289 Installation & Fabrication Details" | - 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"                           |
| - 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"                                | - 8700-RB-0017G, Sht. 7, Rev. 11, "Vent and Air Cond El 713'-6" Service Building"     |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                        |   |

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-MG-1

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.10 Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.17 Cable Spreading Room (1-CS-1) - Lack of 3-Hr Fire Barriers (III.G.2 criteria)
- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0674, Rev. D, "Process Rack Room EL. 713'-6" 3HR. Fire Rated Floor and Walls"
- 8700-10.001-0677, Rev. D, "Rod Position Room EL. 713'-6 3HR Fire Rated Walls and Floor"
- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"

**Supporting EEEEs**

- 8700-DMC-2653 Eval.#14 R2 A0
- FPPCE 12-124 Rev.0
- FPPCE 13-008 Rev.0
- TER 10075 R0

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0672, Rev. E, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0675, Rev. F, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire  
Rated Floor and Walls"  
- 8700-10.001-0759, Rev. H, "Cable Mezzanine Data Sheet"

- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire  
Rated Floor and Walls"  
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-MS-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Based on drawing the barriers range from 18 to 24 inches of reinforced concrete which are considered at least a 3 hour fire rating. The overall rating for this area is 1 hour based on the results in the 3.11.3 record.

The fire barriers were confirmed to be periodically inspected for this fire area.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

8700-DMC-2708 R0 A0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"

- 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" & 756'-0", Cable Vault Area"

- 8700-RC-0021K, Sht. 4, Rev. 11, "Sections Cable Vault Area"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"

- 8700-RC-0021A, Rev. 17, "Slab Plan El. 722'-6" & El. 725'-6" Cable Vault Area"

- 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"

- 8700-RC-0021L, Rev. 12, "Sections, Cable Vault Area"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-MS-1

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies by Prior Approval

Fire Doors:

Fire doors are 1.5 hours fire rated or 3 hour fire rated.

One door was identified as having an unlabeled pressed metal frame. NRC letter dated December 4, 1986 granted exemptions based the fire severity rated calculated for the area.

Fire doors were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Fire Dampers:

Duquesne Light letter dated July 22, 1991 informed the NRC that certain fire dampers were replaced during an outage, were operationally tested, and declared operable based on satisfactory testing results. One of those dampers has a UL 3-hour rating confirmed by drawings.

Fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Complies with Use of EEEE

Fire Dampers:

Engineering evaluations concluded the ductwork has the equivalent of a fire resistance rating of one hour. One damper was also evaluated to not need replacement, and the ductwork blanked off at the penetration based on similar reasons.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

8700-DMC-2708 R0 A0

FPPCE 12-024 Rev.0 Part D

FPPCE 12-024 Rev.0 Part E

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls El. 751'-0" - 756'-0"
- 8700-10.001-0720, Rev. G, "Main Steam & MCC Room Data Sheet"
- 8700-10.001-1012, Rev. A, "Fire Damper VS-D-180 Installation and Fabrication Details"
- 8700-10.001-1014, Rev. A, "Fire Damper VS-D-180 Installation and Fabrication Details"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0008B, Rev. 3, "Plans. Sects & Dets- Stairs Serv. Bldg & Cable Vault"
- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room & Misc Areas"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"
- 8700-RC-0021L, Rev. 12, "Sections, Cable Vault Area"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1013, Rev. A, "Fire Damper VS-D\_180 Installation and Fabrication Details"
- 8700-DMC-2708, Rev. 0, "Analysis of Unqualified Fire Damper VS-D-177 in the West Cable Vault"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" & 756'-0", Cable Vault Area"
- 8700-RC-0021K, Sht. 4, Rev. 11, "Sections Cable Vault Area"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-MS-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

FPPCE 13-011 Rev.0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls EL. 751'-0" - 756'-0"

- 8700-10.001-0720, Rev. G, "Main Steam & MCC Room Data Sheet"

**Open Items and VFDRs**

Item Number	Item Title:
BV1-0714	Complete Penetration Seal Database

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-NS-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

#### Compliance Basis:

The Normal Switchgear Room fire area, 1-NS-1, fire detection consists of area ionization coverage. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Items 1 through 10.

1. Confirmed detectors are mounted on the ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
3. Confirmed detectors do not exceed the listed spacing.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

#### Licensing Actions

- None

#### Supporting EEEs

FPPCE 06-043 Rev.0

FPPCE 12-124 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

**Supporting EEEEs**

FPPCE 13-008 Rev.0

FPPCE 13-011 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0008D, Rev. 11, "Slab Plan at El. 735'-6"-Reinf, Service Building"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

- 10ST-33.16F, Rev. 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735-6 Outline Service Bldg."
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RE-0064M, Sht. 7, Rev. 6, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA 72D, Rev. 1973, "Proprietary Protective Signaling Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-NS-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Complies

Based on plant drawings the barriers [walls, ceiling, and floor] of this fire compartment range in thickness from 12 to 54 inches of concrete construction and are considered to meet or exceed a 3 hour fire rating.

The fire barriers are periodically inspected.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0008D, Rev. 11, "Slab Plan at El. 735'-6"-Reinf, Service Building"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735-6 Outline Service Bldg."
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-NS-1

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies by Prior Approval

##### Fire Doors:

Fire doors are either 1.5 or 3-hour rated.

Fire door S13-11 was identified as having an unlabeled pressed metal frame. NRC letter dated December 4, 1986 granted exemptions based on the fire severity rated calculated for the area.

Fire door S13-6 is a 1.5-hour rated door. No documented exemption or evaluation could be identified that justifies this specific door being less than 3-hour rated, but the NRC SER dated August 30, 1984 granted exemptions for 1-CR-4 that included other 1.5-hour rated fire doors.

Fire doors were confirmed to be inspected periodically by administrative procedures and preventative maintenance task.

##### Fire Dampers:

Duquesne Light letter dated July 22, 1991 informed the NRC that certain fire dampers were replaced during an outage, were operationally tested, and declared operable based on satisfactory testing results. Most dampers in 1-NS-1 have a UL 3-hour rating confirmed by drawings.

Fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance task.

Complies with Use of EEEE

##### Fire Dampers:

An engineering evaluation addresses the adequacy of fire damper 1VS-D-105 as part of the 3-hour-fire-rated barrier separating the two fire compartments and found the 1.5-hour damper to be acceptable.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

FPPCE 11-023 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

**Supporting EEEEs**

FPPCE 13-030 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"
- 8700-10.001-1025, Rev. A, "Fire Damper VS-D-284 Installation & Fabrication Details"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RB-0017L, Rev. 11, "Vent & Air Cond. El. 725'-6" Service Building Sh. 11"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735'-6 Outline Service Bldg."
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- EM 30318, "NRC Inspection #83-69: Fire Dampers"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-1021, Rev. A, "Fire Dampers VS-D-269 A/B Installation & Fabrication Details"
- 8700-10.001-1026, Rev. A, "Fire Damper VS-D-285 Installation & Fabrication Details"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0017H, Rev. 10, "Vent & Air Cond El. 725'-6" Service Building Sh. 8"
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- 8700-RC-0008D, Rev. 11, "Slab Plan at El. 735'-6"-Reinf, Service Building"
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- EM 22598, "Fire Damper VS-D-105"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-NS-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

FPPCE 06-043 Rev.0

FPPCE 12-124 Rev.0

FPPCE 13-008 Rev.0

FPPCE 13-011 Rev.0

TER 11797 R0

#### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0679, Rev. C, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"

- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"

- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"

- 8700-10.001-0680, Rev. E, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"

- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

- 8700-10.001-1099, Rev. C, "Penetration Seal Tables for Service Building EL. 735'-6"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-1120, Rev. C, "Fire Area CS-1, Access to Ceiling Penetrations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment -** 1-PA-1A

**Compliance Statement:** Will Comply with the Use of Commitment

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.1 - NFPA Standards

#### **Compliance Basis:**

The partial area coverage automatic wet pipe sprinkler system is used to protect the transient combustible waste storage and sorting area. It is also required that the hydraulic calculations would need to be revised to include hose stream coverage required by NFPA 13 and include all piping and elevation losses back to the fire pump supply as stated in BV1-2833 (included in Attachment S).

1. Vendor document 8700-10.001-0819 provides hydraulic calculations for the system.
2. Fire department connections are not required.
3. The system is designed to NFPA Standard 13, 1980.
4. A test connection can be found off the riser diagram.
5. For indicating type control valves, see 3.9.5.
6. Hangers and supports are adequate for the system.
7. Sprinkler ratings are appropriate for the space.
8. There is no storage within range of the sprinklers.
9. Baffles are unnecessary, no grating within area.
10. For local water flow detection devices see 3.9.2.
11. For remote alarm main control room information see 3.9.3.
12. Sprinklers are within allowable distance to the ceiling.
13. Spacing between branch lines and sprinklers is acceptable.
14. Sprinkler deflector position has been confirmed adequate.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

- 15. Pendant sprinklers are not used.
- 16. A preaction system is not used.
- 17. Primary and secondary power issues have been resolved through NFPA 805 Section 3.8.1.
- 18. The system has adequate compensatory measures.

**Licensing Actions**

- None

**Supporting EEEs**

FPPCE 12-024 Rev.0 Part A

**References**

- "BVPS-1 NFPA 805 Feasibility Study Report"
- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"
- 1OST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"
- 8700-10.001-0770, Rev. A, "Auxiliary Building Storage Area Sprinklers, EI 768"
- 8700-DMS-0127, Rev. 2, "Primary Auxiliary Building Automatic Sprinkler Protection System"
- 8700-RM-0433-002, Rev. 20, "Valve Oper No Diagram - Fire Protection - Water"
- 8700-RM-416-001, Rev. 14, "P&ID, Vent & Air Cond, Primary Plant"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-01.062-0083, Rev. A, "Early Warning and Actuation Fire Detection Spacing Report"
- 8700-10.001-0819, Rev. A, "Hydraulic Calculations for as built Fire Protection Piping @ PAB EI 752 & 768"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"
- DCP-703, "PAB Automatic Sprinkler Protection"

**Open Items and VFDs**

<b>Item Number</b>	BV1-2833	<b>Item Title:</b> Hydraulic Calculations - Water Supply
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1A

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.2 - Water Flow Alarm

**Compliance Basis:**

There are three separate fixed fire suppression systems in 1-PA-1A and they all have a device to sense water flow. Drawings confirm these systems include a water flow alarm and it is periodically inspected by procedure.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-10.001-0770, Rev. A, "Auxiliary Building Storage Area Sprinklers, El 768"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

- 1OST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"
- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"
- 8700-RE-0021GV, Rev. 10, "Elementary Diagram, Fire Protection (FP) SH 4 of 8"
- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"
- 8700-RM-0416-001, Rev. 16, "Piping & Instrumentation Diagram - Ventilation & Air Cond Primary Plant"

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1A

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.3 - Suppression system annunciation

**Compliance Basis:**

All alarms from these three fire suppression systems in this area, including water flow, trouble, and fire detection alarms, are annunciated in the main control room.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 8700-10.001-0770, Rev. A, "Auxiliary Building Storage Area Sprinklers, EI 768"

- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"

- 8700-RE-0021GV, Rev. 10, "Elementary Diagram, Fire Protection (FP) SH 4 of 8"

- 8700-RE-0021QV, Rev. 13, "Elementary Diagram Annunciator A11 SH 3 of 4"

- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"

- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"

- 8700-RE-0018S, Rev. 7, "Wiring Diagram, Fire Protection, Water Deluge Pnls. FE-WS-2B, 3A & 3B"

- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"

- 8700-RE-0021QW, Rev. 12, "Elementary Diagram, Annunciator A11 "

- 8700-RM-0416-001, Rev. 16, "Piping & Instrumentation Diagram - Ventilation & Air Cond Primary Plant"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1A

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.5 - OS&Y gate valve

**Compliance Basis:**

All three fixed fire suppression systems in 1-PA-1A are provided with individual OS&Y valves.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 8700-10.001-0770, Rev. A, "Auxiliary Building Storage Area Sprinklers, El 768"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"

- 8700-RM-0416-001, Rev. 16, "Piping & Instrumentation Diagram - Ventilation & Air Cond Primary Plant"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1A

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.6 - Valve Performance

**Compliance Basis:**

There are three separate fixed fire suppression systems in area PA-1A and each of the controlling gate valves are each provided with a position monitoring switch which would actuate trouble alarms in the main control room.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10M-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-10.001-0770, Rev. A, "Auxiliary Building Storage Area Sprinklers, El 768"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"

- 10ST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"
- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"
- 8700-RE-0021QS, Rev. 20, "Building Service Panel Ann A11 Window Arrangement"
- 8700-RM-0416-001, Rev. 16, "Piping & Instrumentation Diagram - Ventilation & Air Cond Primary Plant"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1A**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The barriers of 1-PA-1A range from 9 inches to 24 inches of reinforced concrete. The fire rated barriers were confirmed to be periodically inspected.

Complies with Clarification

The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1A, 1-PA-1G, & 1-PA-1C uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Complies with use of EEEE

An EEEE is used to justify the seismic shake space openings within the PAB fire area.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-2653 Eval. #3 & #4 R2 A1

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 10080-RA-0060A, Rev. 5, "Personnel Access Bridge Plans & Elevations"

- 10080-RA-0060C, Rev. 6, "Personnel Access Bridge Connection"

- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"

- 8700-RC-0024M, Rev. 15, "plan El. 768-7 - Outline Auxiliary Building"

- 8700-RC-0029B, Rev. 9, "Coolant Recovery Tank FDNS Sections & Details"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 10080-RA-0060B, Rev. 4, "Personnel Access Bridge Sections & Details"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RC-0021E, Rev. 10, "Slab Plan EL 762'-9 5/8" & EL 767'-10" Cable Vault Area"

- 8700-RC-0029A, Rev. 10, "Coolant Recovery Tank FDNS Plans"

- 8700-RS-0019D, Rev. 9, "Coolant & Deminer. Misc. Framing Plan & Details"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PA-1A

**Compliance Statement:** Complies  
Complies with Clarification  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies with Clarification

The non fire-rated separation (floor, and ventilation chase walls) between compartments 1-PA-1A, 1-PA-1G, & 1-PA-1C uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Complies

Fire Doors:

Drawings and door schedules identify doors as 1.5 or 3 hour rated.

Fire doors were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Complies with Use of EEEE

Fire Dampers:

Drawings identify dampers 1VS-D-188, 189, 190, and 191 between 1-PA-1A and the Fuel Building. An engineering evaluation concluded the ductwork has the equivalent of a fire resistance rating of one hour.

Drawings also identify dampers 1VS-D-170 through 176, and 1VS-D-178 between 1-PA-1A and Safeguards. An engineering evaluation concluded the ductwork has the equivalent of a fire resistance rating of one hour.

##### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

8700-DMC-1484 R0 A1

8700-DMC-2345 R0 A0

FPPCE 12-024 Rev.0 Part A

FPPCE 12-024 Rev.0 Part C

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0060B, Rev. 4, "Personnel Access Bridge Sections & Details"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-10.001-0684, Rev. F, "PAB North Wall Penetrations All Elevations"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0699, Rev. D, "P.A.B South Wall Penetrations All Elevations"
- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"
- 8700-DMC-2345, Rev. 0, "Determination of Area Temp. as a Result of a Fire in Aux Bldg. Elevation 768'-7"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"
- 8700-RB-0008C, Rev. 8, "Vent & Air Cond- EL 745'-6" Auxiliary Building-SH. 3"
- 8700-RB-0008G, Rev. 13, "Air Cooling Heating & Purging Auxiliary Building EL. 768'-7" SH - 7"
- 8700-RC-0021E, Rev. 10, "Slab Plan EL 762'-9 5/8" & EL 767'-10" Cable Vault Area"
- 8700-RC-0029A, Rev. 10, "Coolant Recovery Tank FDNS Plans"
- 8700-RS-0019D, Rev. 9, "Coolant & Deminer. Misc. Framing Plan & Details"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- CR 05-07686, "Non-Conforming Fire Barrier Penetration Seal"
- 10080-RA-0060A, Rev. 5, "Personnel Access Bridge Plans & Elevations"
- 10080-RA-0060C, Rev. 6, "Personnel Access Bridge Connection"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-10.001-0685, Rev. F, "P.A.B North Wall Data Sheet All Elevations"
- 8700-10.001-0697, Rev. B, "Primary Auxiliary Building EL. 768'-7" Floor Penetrations"
- 8700-10.001-0700, Rev. D, "P.A.B. South Wall Penetrations All Elevations Data Sheet"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault & Safeguards Areas, Adjacent to Containment"
- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room & Misc Areas"
- 8700-RB-0008D, Rev. 8, "Vent & Air Cond- EL. 735'-6" Auxiliary Building-SH 4"
- 8700-RB-0008H, Sht. 8, Rev. 16, "Air Cooling, Heating & Purging Auxiliary Building EL 768'-7" "
- 8700-RC-0024M, Rev. 15, "plan EL. 768-7 - Outline Auxiliary Building"
- 8700-RC-0029B, Rev. 9, "Coolant Recovery Tank FDNS Sections & Details"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### Open Items and VFDRs

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1A**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

8700-DMC-2653, Eval.#10 R2 A1  
FPPCE 13-010 Rev.0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0685, Rev. F, "P.A.B North Wall Data Sheet All Elevations"
- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"
- 8700-10.001-0699, Rev. D, "P.A.B South Wall Penetrations All Elevations"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0684, Rev. F, "PAB North Wall Penetrations All Elevations"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0697, Rev. B, "Primary Auxiliary Building EL. 768'-7" Floor Penetrations"
- 8700-10.001-0700, Rev. D, "P.A.B. South Wall Penetrations All Elevations Data Sheet"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**VFDR Number**      BV1-1009      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

**Item Number**      BV1-0714      **Item Title:** Complete Penetration Seal Database

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PA-1C

**Compliance Statement:**   Complies  
                                      Complies with Clarification  
                                      Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

##### Compliance Basis:

Complies

The barriers of 1-PA-1C are 24 inch thick concrete. The fire rated barriers are periodically inspected.

Complies with Clarification

The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1A, 1-PA-1E, 1-PA-1G, & 1-PA-1C uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Complies with use of EEEE

An EEEE concludes the seismic shake space openings within the PAB is acceptable.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEs

8700-DMC-2653 Eval. #3 & #4 R2 A1

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RC-0024A, Rev. 9, "Plan FDN. MAT EL. 717'-0" Auxiliary Building"
- 8700-RC-0029A, Rev. 10, "Coolant Recovery Tank FDNS Plans"
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"
- 8700-RC-0024K, Rev. 13, "Plan El. 752-6 - Outline Auxiliary Building"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1C**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

Drawings and door schedules identify doors as 1.5 or 3 hour rated.

Fire doors were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Complies with Use of EEEE

Fire Dampers:

Drawings identify damper 1VS-D-194 between 1-PA-1C and the Service Building. An engineering evaluation concluded the ductwork has the equivalent of a fire resistance rating of one hour.

Complies with Clarification

The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1A, 1-PA-1E, 1-PA-1G, & 1-PA-1C uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Fire Doors:

There is an elevator shaft with a 1.5-hour rated door on the west wall of 1-PA-1C. The shaft transverses all floors of the auxiliary Building. The acceptability of the separation was evaluated using performance-based methods.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-1484 R0 A1  
FPPCE 12-024 Rev.0 Part B

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"
- 8700-RB-0008D, Rev. 8, "Vent & Air Cond- EL. 735'-6" Auxiliary Building-SH 4"
- 8700-RB-0008F, Rev. 9, "Vent & Air Cond. -EL. 752'-6" Auxiliary Building - SH. 6"
- 90-06-29, "BVPS-1 – Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RB-0008C, Rev. 8, "Vent & Air Cond- EL 745'-6" Auxiliary Building-SH. 3"
- 8700-RB-0008E, Rev. 7, "Vent. & Air Cond. -EL. 752'-6" Auxiliary Building - SH. 5"
- 89-12-19, "BVPS-1 (TAC 56566) – Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-PA-1C

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-2653, Eval.#10 R2 A1

FPPCE 13-010 Rev.0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0685, Rev. F, "P.A.B North Wall Data Sheet All Elevations"
- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"
- 8700-10.001-0700, Rev. D, "P.A.B. South Wall Penetrations All Elevations Data Sheet"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0684, Rev. F, "PAB North Wall Penetrations All Elevations"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0699, Rev. D, "P.A.B South Wall Penetrations All Elevations"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**VFDR Number**      BV1-1009      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

**Item Number**      BV1-0714      **Item Title:** Complete Penetration Seal Database



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-PA-1E

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

#### **Compliance Basis:**

1-PA-1E is the 735'-6" elevation of the Auxiliary Building and is provided with partial ionization fire detection for hazard protection only. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Item 1 through 10.

1. Where provided the detectors were confirmed to be mounted to the concrete ceiling.
2. Confirmed there are no significant platforms in the compartment as described in the standard.
3. Where provided for specific hazard protection, the detector spacing has been confirmed not to exceed the allowable listed spacing of the standard.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-01.080-0559, Rev. C, "IONIZATION SMOKE & HEAT DETECTOR CND PLAN AB 735"
- 8700-01.080-0561, Rev. C, "IONIZATION SMOKE & HEAT DETECTOR CND PLN AB"
- 8700-LSK-020-0007A, Rev. 1, "LOGIC DIAGRAM PNL-CU-39"
- 8700-RC-0024L, Rev. 9, "Plan El. 752-6 - Reinf Auxiliary Building"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"
- 8700-RE-0064JN, Rev. 1, "W/D PNL-CU-39 FP SYSTEM"
- NFPA 72D, Rev. 1973, "Proprietary Protective Signaling Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16D , Rev. 1, "Early Warning Smoke Det. Instr. Test CCR Pumps, AFW Pumps, Chem Add Bldg. and PAB "
- 8700-01.080-0560, Rev. C, "IONIZATION SMOKE & HEAT DETECTOR CND PLAN AB"
- 8700-01.080.0111, Rev. C, "AUX. BLDG. EL. 735 FP SYSTEM CND. PLAN"
- 8700-RC-0024K, Rev. 13, "Plan El. 752-6 - Outline Auxiliary Building"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064JL, Rev. 2, "W/D FIRE DETECTION SYSTEM 735-6 AUX. BLDG"
- 8700-RE-0064JQ, Rev. 1, "Cable Block Diagram - Fire Detection DGP-3, 4, & 5"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1E**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.1 - NFPA Standards

**Compliance Basis:**

The water based suppression systems in the fire compartment 1-PA-1E is an available fire protection feature that were not credited to satisfy the nuclear safety criteria of Chapter of NFPA 805. Therefore a detailed validation was not performed.

There are two separate fixed fire suppression systems in fire area 1-PA-1E in the Primary Auxiliary Building (PAB) at elevation 735ft-6in.

Storage and Trash Partial Area Coverage Automatic Sprinkler System

This system is a partial coverage automatic pre-action type sprinkler system utilizing heat detectors, an automatic pre-action valve, and automatic sprinklers to protect the subject storage and compactor area. If it is required to provide area fire suppression for protection of any redundant safe shutdown components or circuits, then it must be reviewed in reference to the specific location of any such redundant components/circuits to confirm adequate protection as required by NFPA 805. It is also required that the hydraulic calculations would need to be revised to include hose stream coverage required by NFPA 13 and include all piping and elevation losses back to the fire pump supply.

1. The system was confirmed to have a hydraulic calculation for the system with a design density of 0.2 gpm/sq.ft. density.
2. The system specification required the system to be designed to NFPA 13-1980.
3. The system has an OS&Y valve at the inlet to the strainer, inlet to the pre-action valve, and has a pre-action valve.
4. The temperature rating of the sprinklers complies with the standard.
5. There 2 upright sprinklers with water shields and some sidewall sprinklers to better direct flow.
6. A pressure switch is included in the deluge valve trim, located on the discharge side of the deluge valve that provides a flow alarm both locally and in the main control room.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

7. All alarms from the fire suppression system, including water flow, trouble, and fire detection, are annunciated in the main control room.

**Component Cooling Water Pumps Automatic Pre-Action Water Spray System**

The three Component Cooling Water Pumps are provided with an automatic pre-action water spray system using closed heat-responsive directional nozzles. The system is provided with an automatic pre-action valve and is opened upon sensing of fire conditions by heat type fire detectors. This is a special designed system for protection only.

1. A vendor document/calculation depicts the flow and pressure requirements for the system.
2. The water spray density for this system is acceptable for this hazard per the design standard
3. Directional spray nozzles for this system are appropriate.
4. This system has an upstream in-line strainer.
5. There are heat detectors to activate the system. (No timing criteria in procedures)
6. Local visual indications for FIRE and TROUBLE also exist, as well as an audible water flow alarm at the local valve panel and alarm signals are sent to the main control room annunciators.

**Licensing Actions**

- None

**Supporting EEEEs**

8700-DMC-1330 R0 A1  
FPPCE 13-010 Rev.0

**References**

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>- "BVPS-1 NFPA 805 Feasibility Study Report"</li><li>- 1OM-33.1.E, Rev. 12, "Specific Instrumentation &amp; Controls"</li><li>- 8700-06.024-3715, Sht. 1, Rev. 1, "Aux Bldg EI 735-6, Component Cooling Pumps, Fire Prot System"</li><li>- 8700-10.001-0515, Rev. A, "Aux Building 735 - Component Cooling Water Pumps Fire Protection System"</li></ul> | <ul style="list-style-type: none"><li>- 1DBD-33B, Rev. 14, "Fire Protection System"</li><li>- 1OM-33.5.B.1, Rev. 2, "Table 33-1 Deluge Valve Protected Areas"</li><li>- 8700-10.001-0486, Rev. A, "Fire Protection System Flow Calculation for PA-1E CCR Pump Area"</li><li>- 8700-10.001-0779, Rev. A, "Auxiliary Building Smoke Detection, EI 735"</li></ul> |
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |   |  |
|---|--|
| - 8700-10.001-0870, Rev. A, "Auxiliary Building Branch Sprinkler Piping Head Locations, El 735" | - 8700-10.001-0872, Rev. A, "Branch Sprinkler Piping, Hydraulic Calcs. El. 735-6"              |
| - 8700-DMS-0127, Rev. 2, "Primary Auxiliary Building Automatic Sprinkler Protection System"     | - 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"  |
| - 8700-RB-16C, Rev. 12, "Flow Diagram Fire Protection"  | - 8700-RB-2M, Rev. 12, "Fire Protection Arrangement"   |
| - 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"            | - 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement" |
| - 8700-RE-0051K, Rev. 3, "Conduit Plan, Fire Protection System Sh 10"                           | - 8700-RE-0064JJ, Rev. 1, "Fire Alarm System Aux. Building, Plan El 735'-6"                    |
| - 8700-RE-0064JL, Rev. 2, "W/D FIRE DETECTION SYSTEM 735-6 AUX. BLDG"                           | - 8700-RE-0064JN, Rev. 1, "W/D PNL-CU-39 FP SYSTEM"  |
| - 8700-RE-21QZ, Rev. 11, "Elementary Diagram Annunciator A12"                                   | - 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"                                |
| - DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"            | - DCP-0703, Rev. 0, "PAB Automatic Sprinkler Protection"                                       |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                                  |  |

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-PA-1E

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

#### Compliance Basis:

There are two separate fixed fire suppression systems in 1-PA-1E on the PAB 735ft-6in level. Each of these systems is provided with a pressure switch on the deluge valve trim that provides an alarm both locally and in the main control room.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

#### References

- 10M-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-10.001-0515, Rev. A, "Aux Building 735 - Component Cooling Water Pumps Fire Protection System"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

- 10ST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"
- 8700-10.001-0870, Rev. A, "Auxiliary Building Branch Sprinkler Piping Head Locations, El 735"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"

#### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

**Fire Compartment** - 1-PA-1E

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.3 - Suppression system annunciation

#### **Compliance Basis:**

All alarms from these two fire suppression systems in this area, including water flow, trouble, and fire detection, are annunciated in the main control room.

#### Licensing Actions

- None

#### Supporting EEEs

- None

#### References

- 10M-33.1.E, Rev. 12, "Specific Instrumentation & Controls"

- 8700-10.001-0870, Rev. A, "Auxiliary Building Branch Sprinkler Piping Head Locations, El 735"

- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"

- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"

- 8700-RE-0064JN, Rev. 1, "W/D PNL-CU-39 FP SYSTEM"

- 8700-10.001-0515, Rev. A, "Aux Building 735 - Component Cooling Water Pumps Fire Protection System"

- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"

- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"

- 8700-RE-0064JL, Rev. 2, "W/D FIRE DETECTION SYSTEM 735-6 AUX. BLDG"

- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1E

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.5 - OS&Y gate valve

**Compliance Basis:**

Each of the water based fire sprinkler systems is provided with independent OS&Y valves upstream of their respective deluge (pre-action) valve.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 8700-10.001-0515, Rev. A, "Aux Building 735 - Component Cooling Water Pumps Fire Protection System"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"

- 8700-10.001-0870, Rev. A, "Auxiliary Building Branch Sprinkler Piping Head Locations, El 735"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1E**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.6 - Valve Performance

**Compliance Basis:**

The OS&Y gate valves on the inlet to the strainer and to each of the water based systems are each provided with a position monitoring switch.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10M-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-10.001-0515, Rev. A, "Aux Building 735 - Component Cooling Water Pumps Fire Protection System"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"

- 10ST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"
- 8700-10.001-0870, Rev. A, "Auxiliary Building Branch Sprinkler Piping Head Locations, EI 735"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1E**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The barriers of 1-PA-1E are 24 inches of concrete. The fire rated barriers are periodically inspected.

Complies with Clarification

Reviewed, Reviewed, The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1E, 1-PA-1C, 1-PA-1G, & 1-PA-1GB uses a performance-based approach in accordance with NFPA 805 section 3.11.1..

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

8700-DMC-2653 Eval. #3 & #4 R2 A1

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-01.062-0028, Rev. A, "Detailed Fire Modeling Report - Fire Compartment 1-PA-1E"

- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RC-0024H, Rev. 16, "Plan EI 735'-6" - Outline, Auxiliary Building"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"

- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"

- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"

- 8700-RC-0029A, Rev. 10, "Coolant Recovery Tank FDNS Plans"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1E**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

Most fire doors were found to be 1.5 or 3-hour rated per drawings.

Fire doors were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Complies by Previous Approval

Fire Doors:

Door A35-1 was identified as having security modifications, and door A35-6 was identified as having a conduit penetrating through the frame. NRC letter dated December 4, 1986 granted exemptions based the fire severity rated calculated for the area.

Complies with Clarification

Reviewed, Reviewed, The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1E, 1-PA-1C, 1-PA-1G, & 1-PA-1GB uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Fire Dampers:

There no fire dampers in the ventilation shaft that traverses all the elevations of the Auxiliary Building. There are no fire dampers in this ventilation shaft to credit separation between fire compartments; however, the PAB was evaluated using performance-based methods.

Complies with Use of EEEE

Fire Doors:

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

A calculation assesses the condition of fire door A35-7 being less-than-3-hour-fire-rated. This door is a 1 1/2 hour fire rated fire door installed in a fire area boundary wall of Stair Tower No. 2A, separating the Primary Auxiliary Building (PAB) from the Fuel Building. Fire Door 1A35-7 was determined to be acceptable as part of the fire barrier separating the Primary Auxiliary Building fire area from the Fuel Building fire area.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

8700-DMC-1484 R0 A1  
FPPCE 13-030 Rev.0

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RB-0008C, Rev. 8, "Vent & Air Cond- EL 745'-6" Auxiliary Building-SH. 3"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-0008D, Rev. 8, "Vent & Air Cond- EL. 735'-6" Auxiliary Building-SH 4"

#### Open Items and VFDRs

VFDR Number		
BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.	

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

#### **Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-PA-1E

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-2653 Eval.#9 R2 A1

FPPCE 13-010 Rev.0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0685, Rev. F, "P.A.B North Wall Data Sheet All Elevations"

- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"

- 8700-10.001-0700, Rev. D, "P.A.B. South Wall Penetrations All Elevations Data Sheet"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0684, Rev. F, "PAB North Wall Penetrations All Elevations"

- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"

- 8700-10.001-0699, Rev. D, "P.A.B South Wall Penetrations All Elevations"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**VFDR Number**      BV1-1009      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

**Item Number**      BV1-0714      **Item Title:** Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1E**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:** 3.11.5 - ERFBS

**Compliance Basis:**

Power cables for all three charging pumps CH-P-1A, -1B, and -1C are routed on the 722 ft. elevation of the Primary Auxiliary Building (PAB). Power Cables for CH-P-1A and -1B are routed on the 735 ft. elevation of the Auxiliary Building. The elevations of the PAB are interconnected by ventilation and have been defined as a single fire area PAB-1. Therefore, to support the basis for the NRC granted exemption, the 1B charging pump power cable has been wrapped with a 1-hour fire rated barrier on both the 722 ft elevation outside the charging pump cubicles and on the 735 ft elevation of the PAB. Separation of the power cables and equipment within the charging pump cubicles has been achieved by the modifications detailed in Sections 6.4 and 11.20 of the UFPARR.

An ERFBS was installed to provide separation between redundant safe shutdown circuits by protecting mainly armored cable 1CHSBPH300, which is routed through fire compartments 1-PA-1E and 1-PA-1G. The cable also airdrops from cable trays in several locations, between trays and at wall and floor penetrations. The ERFBS was installed on cable trays 1TH720P, 1TH721P, and cable No. 1CHSBPH300 on elevation 735ft-6in of the Auxiliary Building. The fire barrier system is rated for 1 hour.

The following configurations bound ERFBS installation protecting the CH-P-1B power cable:

- Freestanding cable tray boxed configuration
- Cable tray mounted against structure
- Cable airdrop boxed configuration
- Cable airdrop preformed conduit section

Each of the above configurations were evaluated in DEC-0234. The evaluations concluded that the ERFBS used to protect the CH-P-1B power cable were either bounded by qualified fire test or were expected to provide protection equivalent to a 1-hour fire endurance rating.

The ERFBS is periodically inspected by procedure.

**Licensing Actions**

- None

**Supporting EEEEs**

8700-DEC-0234 R0 A2



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-10.001-1126, Rev. A, "FIRE TEST REPORTS FOR DARMATT KM-1 FIRE PROTECTION SYSTEMS"
- 8700-DEC-0234, Rev. 0, Add. 1, "Fire Wrap Analysis for CH-P-1B Power Cable"
- 8700-RE-0034AH, Rev. 14, "Cable Tray Designation Auxiliary Building "
- NRC GL86-10, Supp 1, Rev. 0, "NRC Gen. Letter 86-10, Supp. 1, Fire End. Test Acc. Criteria for Fire Barr. Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 1BVT 1.33.5, Rev. 7, "BV1 Fire Rated Assemblies Visual Inspections"
- 8700-DEC-0234, Rev. 0, "Fire Wrap Analysis for CH-P-1P Power Cable"
- 8700-DEC-0234, Rev. 0, Add. 2, "Fire Wrap Analysis for CH-P-1B Power Cable"
- 8700-RE-0034H, Rev. 16, "Cable Tray Plan Auxiliary Building"
- TPI Doc. no. KM-1-IM-1, Rev. 6, "TRANSCO Products, Inc. Install. Manual for Darmatt KM-1 Fire Protective Systems"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1G**

**Compliance Statement:**   Complies  
                                      Complies with Clarification  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The north, south, east, and west barriers of 1-PA-1G are 24 inches of reinforced concrete to any other fire area. The fire rated barriers are periodically inspected.

Complies with Clarification

The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1A, 1-PC-1E, 1-PA-1E, 1-PA-1G, 1-PA-1GA, & 1-PA-1GC uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Complies with use of EEEE

The section of the west barrier adjacent 1-PT-1 is constructed of block walls. An evaluation for the block wall conclude that the 12 inch concrete masonry block is greater than the equivalent thickness of a block wall with a 4-hour fire rating based on information from the National Concrete Masonry Association Publication TEK-35A.

A section of the barrier that separates 1-PA-1G from 1-PA-1-GB was a large opening used for ventilation. This opening was sealed to provide safe shutdown separation. The sealing method is consistent with large blackout penetrations and has been evaluated as acceptable.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

8700-DMC-2653 Eval. #3 & #4 R2 A1

8700-DMC-3103 R0 A0

EM 71592

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task S.11C Multi  
Compartment Fire Analysis"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-01.062-0029, Rev. A, "Detailed Fire Modeling Report - Fire  
Compartment 1-PA-1G"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"</li> <li>- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"</li> <li>- 8700-RA-0010F, Rev. 3, "Stairs &amp; Details Auxiliary BLDG."</li> <li>- 8700-RA-0025DX, Rev. 1, "Block Wall CV1-2 Cable Vault Area EL. 722'-6""</li> <li>- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"</li> <li>- 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"</li> <li>- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"</li> </ul> | <ul style="list-style-type: none"> <li>- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"</li> <li>- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"</li> <li>- 8700-RA-0025DW, Rev. 1, "Block Wall CV1-1 Cable Vault Area EL. 722'-6"</li> <li>- 8700-RA-0025DY, Rev. 2, "Block Wall CV1-3 Cable Vault Area EL. 722'-6""</li> <li>- 8700-RC-0024A, Rev. 9, "Plan FDN. MAT EL. 717'-0" Auxiliary Building"</li> <li>- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"</li> </ul> |
|---|--|

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1G**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire doors are 1.5 or 3-hour rated per drawings.

Damper 1VS-D-34C has been identified as 1.5 hour fired rated. Also, the ductwork in the 1C cubicle is fire wrapped to a 1.5-hour barrier.

Fire doors and dampers were confirmed to be inspected periodically by administrative procedures.

Complies by Prior Approval

Fire door A22-3 was identified as having an unlabeled structural channel frame. NRC letter dated December 4, 1986 granted exemptions based the fire severity rating calculated for the area.

Complies with Clarification

The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1A, 1-PC-1E, 1-PA-1E, 1-PA-1G, 1-PA-1GA, & 1-PA-1GC uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

**Fire Doors:**

There is an elevator shaft with door on the west wall of PA-1G. The shaft transverses all floors of the auxiliary building. The door to the elevator has a 1.5-hour fire rating and acceptability of the separation was evaluated using performance-based methods.

**Fire Dampers:**

Drawings identify the ventilation for 1-PA-1G as the ventilation shaft traverses all of the elevations of the Auxiliary Building. There are no fire dampers in this ventilation shaft. There is some ductwork between 1-PA-1G and the 1-PA-1C charging pump cubicle; however there is no damper installed at the barrier between the cubicle and 1-PA-1G barrier, but there is a 1.5-hour rated fire damper located within the cubicle.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

Separation for the Auxiliary Building was evaluated using performance-based methods.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0008B, Rev. 8, "Vent & Air Cond- EL 722'-6" Auxiliary Building - SH. 2"
- 8700-RB-0008D, Rev. 8, "Vent & Air Cond- EL. 735'-6" Auxiliary Building- SH 4"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Supporting EEEs**

8700-DMC-1484 R0 A1

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RA-0010F, Rev. 3, "Stairs & Details Auxiliary BLDG."
- 8700-RB-0008A, Rev. 6, "Vent & Air Cond. -EL 722'-6" Auxiliary Building- SH. 1"
- 8700-RB-0008C, Rev. 8, "Vent & Air Cond- EL 745'-6" Auxiliary Building- SH. 3"
- DCP-561, Rev. 0, "Charging Pump Cubicles Ventilation Dampers and Ductwork"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PA-1G

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

8700-DMC-2653 Eval. #1 & #2 R2 A1  
8700-DMC-2653 Eval.#15 R2 A0  
8700-DMC-2653 Eval.#5 & #6 R2 A1  
8700-DMC-2653 Eval.#9 R2 A1  
FPPCE 13-010 Rev.0  
TER 11987 R0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-0685, Rev. F, "P.A.B North Wall Data Sheet All Elevations"
- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"
- 8700-10.001-0700, Rev. D, "P.A.B. South Wall Penetrations All Elevations Data Sheet"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0684, Rev. F, "PAB North Wall Penetrations All Elevations"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0699, Rev. D, "P.A.B South Wall Penetrations All Elevations"
- 8700-10.001-0763, Rev. F, "HVAC Room El. 713'-6" 3 HR Fire Rated Floor and Walls"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

**Item Number**      BV1-0714      **Item Title:** Complete Penetration Seal Database

**VFDR Number**      BV1-1009      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1G

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:** 3.11.5 - ERFBS

**Compliance Basis:**

Power cables for all three charging pumps CH-P-1A, -1B, and -1C are routed on the 722 ft. elevation of the Primary Auxiliary Building (PAB). Power Cables for CH-P-1A and -1B are routed on the 735 ft. elevation of the Auxiliary Building. The elevations of the PAB are interconnected by ventilation and have been defined as a single fire area PAB-1. Therefore, to support the basis for the NRC granted exemption, the 1B charging pump power cable has been wrapped with a 1-hour fire rated barrier on both the 722 ft elevation outside the charging pump cubicles and on the 735 ft elevation of the PAB. Separation of the power cables and equipment within the charging pump cubicles has been achieved by the modifications detailed in Sections 6.4 and 11.20 of the UFPARR.

An ERFBS was installed to provide separation between redundant safe shutdown circuits by protecting mainly armored cable 1CHSBPH300, which is routed through fire compartments 1-PA-1E and 1-PA-1G. The cable also airdrops from cable trays in several locations, between trays and at wall and floor penetrations. The ERFBS was installed on cable trays 1TH720P, 1TH721P, and cable No. 1CHSBPH300 on elevation 735ft-6in of the Auxiliary Building. The fire barrier system is rated for 1 hour.

The following configurations bound ERFBS installation protecting the CH-P-1B power cable:

- Freestanding cable tray boxed configuration
- Cable tray mounted against structure
- Cable airdrop boxed configuration
- Cable airdrop preformed conduit section

Each of the above configurations were evaluated in DEC-0234. The evaluations concluded that the ERFBS used to protect the CH-P-1B power cable were either bounded by qualified fire test or were expected to provide protection equivalent to a 1-hour fire endurance rating.

The ERFBS is periodically inspected by procedure.

**Licensing Actions**

**Supporting EEEEs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- None

**Supporting EEEEs**

8700-DEC-0234 R0 A2

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 8700-10.001-1126, Rev. A, "FIRE TEST REPORTS FOR DARMATT KM-1 FIRE PROTECTION SYSTEMS"  
- 8700-DEC-0234, Rev. 0, Add. 1, "Fire Wrap Analysis for CH-P-1B Power Cable"  
- 8700-RE-0034AH, Rev. 14, "Cable Tray Designation Auxiliary Building "  
- CR 01-0769, Rev. 0, "Review Benchmarking Info. on HEMYC Firewrap Qualification"  
- NRC GL86-10, Supp 1, Rev. 0, "NRC Gen. Letter 86-10, Supp. 1, Fire End. Test Acc. Criteria for Fire Barr. Systems"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"  
- 8700-DEC-0234, Rev. 0, "Fire Wrap Analysis for CH-P-1P Power Cable"  
- 8700-DEC-0234, Rev. 0, Add. 2, "Fire Wrap Analysis for CH-P-1B Power Cable"  
- 8700-RE-0034H, Rev. 16, "Cable Tray Plan Auxiliary Building"  
- ECP-00025, Rev. 0, "Hemyc Fire Wrap Replacement"  
- TPI Doc. no. KM-1-IM-1, Rev. 6, "TRANSCO Products, Inc. Install. Manual for Darmatt KM-1 Fire Protective Systems"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PA-1GA

**Compliance Statement:**   Complies  
                                     Complies with Clarification

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

##### Compliance Basis:

Complies

The north, south, east, and west barriers are 24 inches of reinforced concrete. The fire rated barriers are periodically inspected.

Complies with Clarification

The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1G & 1-PA-1GA uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

##### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting FEEEs

- None

##### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"

- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

##### Open Items and VFDRs

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PA-1GA

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies with Clarification

The non fire-rated separation (e.g. ventilation chase) between compartments 1-PA-1GA & 1-PA-1G uses a performance-based approach in accordance with NFPA 805 section 3.11.3.

Complies

Fire Doors:

The access to the charging pump cubicles is by a hatch for each cubicle at the 735' elevation of the auxiliary building. The hatch of the 1A pump cubicle was fitted with a 1 hour fire rated barrier. The hatch was confirmed to be inspected periodically by administrative procedures.

Fire Dampers:

A damper with a 1.5 hour rating is installed in the ductwork of the 1-PA-1G cubicle exhaust. Fire dampers were confirmed to be inspected periodically by administrative procedures.

Complies with use of EEEE:

Fire Dampers:

The exhaust duct configuration in the 1-PA-1GA charging pump cubicle was evaluated and concluded to not require fire wrap to maintain a 1 1/2 hour fire rating.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEs

8700-DMC-3037 R0 A0

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 82-11-22, "NRC - Request for Exemption"
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 82-06-30-1, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12"
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RB-0008B, Rev. 8, "Vent & Air Cond- EL 722;-6" Auxiliary Building - SH. 2"
- DCP-561, Rev. 0, "Charging Pump Cubicles Ventilation Dampers and Ductwork"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1GA

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-PA-1GB

**Compliance Statement:**   Complies  
    Complies with Clarification

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

### **Compliance Basis:**

Complies

The north, south, east, and west barriers are 24 inches of reinforced concrete. There is an access hatch to the cubicle at the 735' elevation. The fire rated barriers are periodically inspected.

Complies with Clarification

The non fire-rated separation (e.g. ventilation chase) between compartments 1-PA-1E & 1-PA-1GB uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Complies with use of EEEE

A section of the barrier that separates 1-PA-1G from 1-PA-1-GB was a large opening used for ventilation. This opening was sealed to provide safe shutdown separation. The sealing method is consistent with large blockout penetrations and has been evaluated as acceptable.

### **Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

### **Supporting EEEEs**

8700-DMC-3103 R0 A0

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"

- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PA-1GB

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies

Fire Doors:

The access to the charging pump cubicles is by a hatch for each cubicle at the 735' elevation of the auxiliary building. The hatch of the B pump cubicle is not rated.

Fire Dampers:

The cubicle exhaust ductwork from adjacent cubicles are separated by 1.5-hour fire dampers at the barrier plane and any ductwork with supporting steel within the 1B cubicle is wrapped with fire proofing material to generate a protective barrier of at least 1.5 hours. Also the ventilation opening at the 722' elevation is sealed with an approved fire sealant.

A drawing identifies VS-D-4-34A and VS-D-4-34B between 1-PA-1GA and 1-PA-1GB, and 1-PA-1GB respectively. The procurement information both found in the DCP package identify that the dampers to be classified as 1.5-hour rated in accordance with NFPA 90A.

Fire dampers were verified to be inspected periodically by administrative procedures.

Complies with Clarification

Part of the fire barrier separation between compartments 1-PA-1GB & 1-PA-1G uses a performance-based approach in accordance with NFPA 805 section 3.11.3.

Complies with use of EEEE:

Fire Dampers:

The exhaust duct configuration in the 1-PA-1G charging pump cubicles was evaluated and concluded to not require fire wrap to maintain a 1 1/2 hour fire rating.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEs

8700-DMC-3037 R0 A0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 82-06-30-1, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12"
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 82-11-22, "NRC - Request for Exemption"
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0071, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1E)"
- 8700-RB-0008B, Rev. 8, "Vent & Air Cond- EL 722;-6" Auxiliary Building - SH. 2"
- DCP-561, Rev. 0, "Charging Pump Cubicles Ventilation Dampers and Ductwork"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1GB

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 8700-10.001-0816, Rev. B, "ANSI Acceptance of Testing For Promatec Fire Seal Designs"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PA-1GC**

**Compliance Statement:**   Complies  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The north, south, east, and west barriers are 24 inches of reinforced concrete. There is an access hatch to the cubicle at the 735' elevation. The fire rated barriers are periodically inspected.

Complies with Clarification

The non fire-rated separation (floor and ventilation chase walls) between compartments 1-PA-1G & 1-PA-1GC uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"

- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### **Fire Compartment - 1-PA-1GC**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Complies with use of EEEE

##### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### **Compliance Basis:**

Complies

Fire Doors:

The access to the charging pump cubicles is by a hatch for each cubicle at the 735' elevation of the aux building. The hatch of the 1C pump cubicle was fitted with a 1 hour rated barrier.

This hatch for the 1C charging pump cubicle is periodically inspected per procedures.

Fire Dampers:

The 1C charging pump cubicle is isolated from adjacent cubicles by a 1.5 hour fire damper in accordance with NFPA 90A, with any exhaust ductwork wrapped with fire proofing material in the adjacent cubicle to generate a protective barrier of at least 1.5 hours.

Fire dampers were confirmed to be inspected periodically by administrative procedures.

Complies with Clarification

Part of the fire barrier separation between compartments 1-PA-1GC & 1-PA-1GB uses a performance-based approach in accordance with NFPA 805 section 3.11.3.

Complies with use of EEEE

Fire Dampers:

The exhaust duct configuration in the 1-PA-1GC charging pump cubicles was evaluated and concluded to not require fire wrap to maintain a 1 1/2 hour fire rating.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

8700-DMC-3037 R0 A0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 82-11-22, "NRC - Request for Exemption"
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0068, Rev. A, "Fire Risk Evaluation of Auxiliary Building General Area (1-PA-1G)"
- 8700-RB-0008B, Rev. 8, "Vent & Air Cond- EL 722;-6" Auxiliary Building - SH. 2"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 82-06-30-1, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12"
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- DCP-561, Rev. 0, "Charging Pump Cubicles Ventilation Dampers and Ductwork"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-PA-1GC

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-1009	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-PT-1**

**Compliance Statement:**   Complies  
                                      Complies with Clarification  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The barriers of fire compartment 1-PT-1 traverse several elevations of the plant and have a minimum thickness of 12". This compartment has an overall rating of 1 hour based on ventilation ductwork and fire severity.

Part of the east barrier with 1-PA-1G is constructed with block walls labeled as CV-1-1, CV-1-2, and CV-1-3. These are discussed below under EEEE.

The fire rated barriers were confirmed to be periodically inspected for this fire compartment.

Complies with Clarification

Part of the fire barrier separation between compartments 1-PT-1 & 1-QP-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Complies with use of EEEE

Part of the east barrier with 1-PA-1G is constructed with block walls CV-1-1, CV-1-2, and CV-1-3. The block walls are constructed of 12 inch concrete masonry block and evaluated to show the equivalent thickness of a 12-inch block wall at BV1 is greater than the equivalent thickness of a block wall with a 4-hour fire rating based on information from the National Concrete Masonry Association Publication TEK-35A.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

8700-DMC-2653 Eval. #3 & #4 R2 A1  
EM 71592

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"  
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"  
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
  
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0066, Rev. A, "Fire Risk Evaluation of Quench Spray / AFW Pump Room (1-QP-1)"
- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0708, Rev. C, "Quench Spray Pump and Aux. Feed Pump EL 735'-6" Floor Pens. Fire Walls & Data"
- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1016, Rev. A, "Fire Damper VS-D-184 Installation & Fabrication Details"
- 8700-10.001-1039, Rev. A, "Fire Damper VS-D-361 Installation & Fabrication Details"
- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault & Safeguards Areas, Adjacent to Containment"
- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RA-0025DX, Rev. 1, "Block Wall CV1-2 Cable Vault Area EL. 722'-6"
- 8700-RA-0025E, Rev. 1, "Block Wall Location Plan, Cable Vault EL. 722'-6"
- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room & Misc Areas"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
  
- 8700-RC-0021H, Rev. 14, "Sections, Cable Vault Area"
- 8700-RC-0021K, Sht. 4, Rev. 11, "Sections Cable Vault Area"
  
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations EL. 735'-6"
- 8700-01.062-0065, Rev. A, "Fire Risk Evaluation of Pipe Tunnel (1-PT-1)"
  
- 8700-10.001-0691, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
  
- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room EL. 722'-6" and EL. 735'-6", 3 HR Fire Rated Walls"
- 8700-10.001-1015, Rev. A, "Fire Damper VS-D-184 Installation & Fabrication Details"
- 8700-10.001-1038, Rev. A, "Fire Damper VS-D-361 Installation & Fabrication Details"
- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
  
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RA-0025DW, Rev. 1, "Block Wall CV1-1 Cable Vault Area EL. 722'-6"
- 8700-RA-0025DY, Rev. 2, "Block Wall CV1-3 Cable Vault Area EL. 722'-6"
- 8700-RB-0005K, Sht. 10, Rev. 5, "Air Cooling Pipe Tunnel & Misc Areas"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RC-0021A, Rev. 17, "Slab Plan EL. 722'-6" & EL. 725'-6" Cable Vault Area"
- 8700-RC-0021D, Rev. 15, "Slab Plan EL. 751'-0" & 756'-0", Cable Vault Area"
- 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"
- 8700-RC-0021L, Rev. 12, "Sections, Cable Vault Area"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 89-12-19, "BVPS-1 (TAC 56566) – Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- EM 71592, "Fire Rating of Block Walls"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 90-06-29, "BVPS-1 – Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- TER 11815, Rev. 1, "Main Steam Fire Area MS-1 Seismic Gap (Fire & Flood) Seals"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-0987	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PT-1

**Compliance Statement:**   Complies  
                                      Complies by Previous Approval  
                                      Complies with Clarification  
                                      Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies

Fire Doors:

Doors MS51-2, CV35-4, CV22-1, MS35-5, and A22-3 are 3 hour fire rated.

Fire Dampers:

The fire dampers associated with the boundaries of 1-PT-1 are 1VS-D-145, 1VS-D-146, 1VS-D-147, 1VS-D-162, 1VS-D-163, 1VS-D-179, 1VS-D-184, 1VS-D-187, and 1VS-D-361. Dampers 1VS-D-184 and 1VS-D-361 are 3-hour fire rated.

Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Complies by Prior Approval

The NRC letter dated 1/4/86 granted exemptions for the following doors based upon the 1/14/85 submittal. The SER evaluates the fact that the fire severity in each of the affected fire areas is less than 120 minutes and typically less than 60 minutes. The staff therefore concluded the doors provided an acceptable level of protection.

Door A22-3 was identified as having an unlabeled structural channel frame.

Door MS51-2 was identified as having an unlabeled pressed metal frame.

Door CV22-1 was identified as having security modification of a magnetic alarm switch on the door face and frame.

Complies with Clarification

Fire Doors:

WebTRAN v13.16c



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Door MS35-4 is not fire rated and is located between 1-QP-1 and 1-PT-1. Part of the fire barrier separation between compartments 1-PT-1 & 1-QP-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.3.

Fire Dampers:

Dampers 1VS-D-145, 1VS-D-146, 1VS-D-147, and 1-VS-D-187 are associated with the boundary between 1-QP-1 and 1-PT-1 are not UL qualified but are included in the performance-based approach.

Complies with Use of EEEE

Dampers 1VS-D-162, 1VS-D-163, and 1VS-D-179 were evaluated and were concluded to be adequate for the hazard.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

FPPCE 11-007 Rev.0  
FPPCE 12-024 Rev.0 Part D  
FPPCE 12-024 Rev.0 Part F

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 10ST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations EL. 735'-6"
- 8700-01.062-0065, Rev. A, "Fire Risk Evaluation of Pipe Tunnel (1-PT-1)"
- 8700-10.001-0691, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10M-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 10ST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0066, Rev. A, "Fire Risk Evaluation of Quench Spray / AFW Pump Room (1-QP-1)"
- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

#### Beaver Valley Unit 1

##### References

- 8700-10.001-0708, Rev. C, "Quench Spray Pump and Aux. Feed Pump EL 735'-6" Floor Pens. Fire Walls & Data"
- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls EL. 751'-0" - 756'-0"
- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1016, Rev. A, "Fire Damper VS-D-184 Installation & Fabrication Details"
- 8700-10.001-1039, Rev. A, "Fire Damper VS-D-361 Installation & Fabrication Details"
- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault & Safeguards Areas, Adjacent to Containment"
- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RA-0025DX, Rev. 1, "Block Wall CV1-2 Cable Vault Area EL. 722'-6"
- 8700-RA-0025E, Rev. 1, "Block Wall Location Plan, Cable Vault EL. 722'6"
- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room & Misc Areas"
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
- 8700-RC-0021H, Rev. 14, "Sections, Cable Vault Area"
- 8700-RC-0021K, Sht. 4, Rev. 11, "Sections Cable Vault Area"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- EM 71592, "Fire Rating of Block Walls"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room EL. 722'-6" and EL. 735'-6", 3 HR Fire Rated Walls"
- 8700-10.001-1015, Rev. A, "Fire Damper VS-D-184 Installation & Fabrication Details"
- 8700-10.001-1038, Rev. A, "Fire Damper VS-D-361 Installation & Fabrication Details"
- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RA-0025DW, Rev. 1, "Block Wall CV1-1 Cable Vault Area EL. 722'-6"
- 8700-RA-0025DY, Rev. 2, "Block Wall CV1-3 Cable Vault Area EL. 722'-6"
- 8700-RB-0005K, Sht. 10, Rev. 5, "Air Cooling Pipe Tunnel & Misc Areas"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RC-0021A, Rev. 17, "Slab Plan EL. 722'-6" & EL. 725'-6" Cable Vault Area"
- 8700-RC-0021D, Rev. 15, "Slab Plan EL. 751'-0" & 756'-0", Cable Vault Area"
- 8700-RC-0021J, Sht. 3, Rev. 15, "Sections Cable Vault Area"
- 8700-RC-0021L, Rev. 12, "Sections, Cable Vault Area"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- TER 11815, Rev. 1, "Main Steam Fire Area MS-1 Seismic Gap (Fire & Flood) Seals"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-0987	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-PT-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

8700-DMC-2653 Eval. #1 & #2 R2 A1  
8700-DMC-2653 Eval.#12 R2 A1  
8700-DMC-2653 Eval.#5 & #6 R2 A1  
FPPCE 13-011 Rev.0

#### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations EL. 735'-6"
- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"
- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"
- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-10.001-0691, Rev. D, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0708, Rev. C, "Quench Spray Pump and Aux. Feed Pump EL 735'-6" Floor Pens. Fire Walls & Data"
- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls EL. 751'-0" - 756'-0"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0""  
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room El. 722'-6" and El. 735'-6", 3 HR Fire Rated Walls"

- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-0987	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
--------------------	----------	--

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

*Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.*

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-QP-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

Complies

In 1-QP-1 only the areas containing auxiliary feedwater pumps is provided with ionization smoke detectors. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Item 1 through 10

1. Confirmed smoke detectors are located on the ceiling.
2. Confirmed no significant platforms as described in the standard.
3. Confirmed smoke detector spacing does not exceed the allowable listed spacing as modified for the type of ceiling construction.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed there are no of air duct fire detectors.
6. Where detectors are utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEEs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- None

**Supporting EEEEs**

8700-DMC-2653 Eval.#12 R2 A1  
 FPPCE 12-024 Rev.0 Part D

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
- 8700-RC-0021G, Rev. 14, "Section, Cable Vault Area"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064JQ, Rev. 1, "Cable Block Diagram - Fire Detection DGP-3, 4, & 5"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"
- 10ST-33.16D , Rev. 1, "Early Warning Smoke Det. Instr. Test CCR Pumps, AFW Pumps, Chem Add Bldg. and PAB "
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" & 756'-0", Cable Vault Area"
- 8700-RC-0021H, Rev. 14, "Sections, Cable Vault Area"
- 8700-RE-0001T, Rev. 50, "480V One Line Diagram SH. 12"
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"
- 8700-RE-0064B, Sht. 2, Rev. 15, "PLAN-FIRE ALARM & SECURITY ALARM"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-QP-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:**     3.9.1 - NFPA Standards

**Compliance Basis:**

Fire Compartment 1-QP-1 contains an automatic pre-action water spray system, which is directed at the auxiliary feedwater pumps and is within the scope of NFPA 15. This is a specially designed system for pump protection only.

Complies

1. A vendor calculation depicts the flow and pressure requirements for the system, which are well within the available supply.
2. The water spray density for this system meets the minimum acceptable criteria for this hazard per the design standard. (See commitment below)
3. Piping and fittings are adequately designed for the working pressure requirements.
4. Piping and fittings are protected from corrosion.
5. Directional spray nozzles for this system are UL listed and FM approved.
6. This system utilizes an upstream in-line strainer since the orifices in the spray nozzles are less than 1/2 inch.
7. Individual nozzle strainers are not required because all nozzles in the system are larger than 1/8 inch.
8. Unapproved gasketed fittings are not used in the design of the system.
10. Fire detection, water flow and system trouble alarms for the system are indicated locally and annunciated on a panel in the Main Control Room. See commitment below.
11. Primary and secondary power sources for the system control panels are addressed by NFPA 805 Transition Record 3.8.1.
12. Compensatory measures shown in 1/2-ADM-1900 for system impairment are appropriate for the level of importance of this system.

Will Comply with the Use of a Commitment

9. Verification of system actuation within 20 seconds after heat detector activation will be included in procedures.

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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
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10. Relocate heat detector on the turbine driven aux feed pump over the hazard.

**Licensing Actions**

- None

**Supporting EEEs**

FPPCE 12-024 Rev.0 Part D

FPPCE 13-011 Rev.0

**References**

- "BVPS-1 NFPA 805 Feasibility Study Report"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-33.5.B.1, Rev. 2, "Table 33-1 Deluge Valve Protected Areas"
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0485, Rev. A, "Fire Prot. System Water Flow Calc. for PT-1, Auxiliary Feedwater Pump Area"
- 8700-DMC-3079, Rev. 1, "Fire Pump Minimum Operating Curve"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- BVS-529, Rev. 0, "Sprinkler & Water Spray Fire Protection Systems"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 11700.34-NP(B) 73001X-001-0, Rev. 0, "Pipe Stress Analysis Calc - Fire Protection Auxiliary FW Pumps"
- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 1OST-33.13B, Rev. 14, "Deluge Valve Fire Protection System Instrument Test"
- 1OST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0474, Rev. B, "Fire Protection Deluge Control Panel for Auxiliary Feedwater Area"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2841	<b>Item Title:</b> Heat detector on the turbine driven aux feed pump is partially obstructed
<b>Item Number</b>	BV1-2828	<b>Item Title:</b> Revise procedure 1OST-33.13B, Deluge Valve Fire Protection System Instrument Test, to define actuation criterion

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-QP-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.2 - Water Flow Alarm

**Compliance Basis:**

The auxiliary feedwater pumps are protected by an automatic pre-action water spray system using closed nozzles and are provided with a water flow detection device pressure sensor that provides an alarm both locally and in the main control room.

**Licensing Actions**

- None

**References**

- "BVPS-1 NFPA 805 Feasibility Study Report"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-33.4.ADL, Rev. 1, "Auxiliary Feedwater Pumps Area Fire"
- 1OST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0474, Rev. B, "Fire Protection Deluge Control Panel for Auxiliary Feedwater Area"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

**Supporting EEEEs**

- None

- 11700.34-NP(B) 73001X-001-0, Rev. 0, "Pipe Stress Analysis Calc - Fire Protection Auxiliary FW Pumps"
- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 1OM-33.5.B.1, Rev. 2, "Table 33-1 Deluge Valve Protected Areas"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0485, Rev. A, "Fire Prot. System Water Flow Calc. for PT-1, Auxiliary Feedwater Pump Area"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RM-0433-001, Rev. 20, "Valve Oper No Diagram Fire Protection Water"
- 8700-RM-0433-7, Sht. 7, Rev. 14, "Valve OPER NO Diagram - Fire Protection Details"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-QP-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.3 - Suppression system annunciation

**Compliance Basis:**

All alarms from the auxiliary feedwater pumps automatic pre-action water spray system, including water flow, trouble, and fire detection are annunciated in the main control room.

**Licensing Actions**

- None

**References**

- "BVPS-1 NFPA 805 Feasibility Study Report"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-33.4.ADL, Rev. 1, "Auxiliary Feedwater Pumps Area Fire"
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0485, Rev. A, "Fire Prot. System Water Flow Calc. for PT-1, Auxiliary Feedwater Pump Area"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RM-0433-001, Rev. 20, "Valve Oper No Diagram Fire Protection Water"
- 8700-RM-0433-7, Sht. 7, Rev. 14, "Valve OPER NO Diagram - Fire Protection Details"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Supporting EEEs**

- None

- 11700.34-NP(B) 73001X-001-0, Rev. 0, "Pipe Stress Analysis Calc - Fire Protection Auxiliary FW Pumps"
- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 1OM-33.5.B.1, Rev. 2, "Table 33-1 Deluge Valve Protected Areas"
- 1OST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0474, Rev. B, "Fire Protection Deluge Control Panel for Auxiliary Feedwater Area"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"

**Open Items and VFDRs**

-None

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

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.5 - OS&Y gate valve

**Compliance Basis:**

The auxiliary feedwater pumps are provided with an automatic pre-action water spray system that is provided with an OS & Y gate valve.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 8700-RM-0433-7, Sht. 7, Rev. 14, "Valve OPER NO Diagram - Fire Protection Details"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

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#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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Fire Compartment - 1-QP-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

#### Compliance Basis:

The OS & Y control valve for the system and at the inlet to the in-line strainer supplying water to the system are both provided with position monitoring switches. These monitoring switches send trouble alarms to the Main Control Room.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

#### References

- "BVPS-1 NFPA 805 Feasibility Study Report"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-33.4.ADL, Rev. 1, "Auxiliary Feedwater Pumps Area Fire"
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"
- 83-12-16, "BVPS-1 Appendix R - Additional Exemption Requests Based on Generic Letter 83-33"
- 8700-10.001-0474, Rev. B, "Fire Protection Deluge Control Panel for Auxiliary Feedwater Area"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"
- DCP-0268, Rev. 0, "Fire Protection Modifications, Appendix R Controlled Circuitry"
- 11700.34-NP(B) 73001X-001-0, Rev. 0, "Pipe Stress Analysis Calc - Fire Protection Auxiliary FW Pumps"
- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 1OM-33.5.B.1, Rev. 2, "Table 33-1 Deluge Valve Protected Areas"
- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Ammendment No. 18 to Facility Operating License No DPR-66"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0485, Rev. A, "Fire Prot. System Water Flow Calc. for PT-1, Auxiliary Feedwater Pump Area"
- 8700-RE-0018BC, Rev. 2, "Wiring Diagram Fire Protection Panels - Halon, CCR & AFW"
- 8700-RM-0433-001, Rev. 20, "Valve Oper No Diagram Fire Protection Water"
- 8700-RM-0433-7, Sht. 7, Rev. 14, "Valve OPER NO Diagram - Fire Protection Details"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

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#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 1-QP-1

**Compliance Statement:**   Complies  
                                      Complies with Clarification  
                                      Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

##### Compliance Basis:

Complies

The minimum concrete barrier thickness for this compartment is 18". A block wall CV-2-2 which communicates with the adjacement compartment 1-CV-1 is discussed below under EEEE.

The fire rated barriers were confirmed to be periodically inspected for this fire area.

Complies with Clarification

The non fire-rated separation (ceiling, wall, floor and ventilation) between compartments 1-QP-1 & 1-PT-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Complies with use of EEEE

As a part of the east barrier with 1-CV-1, block wall CV-2-2 is included. The block walls are constructed of 12 inch concrete masonry block and evaluated to show the equivalent thickness of a 12-inch block wall at BV1 is greater than the equivalent thickness of a block wall with a 4-hour fire rating based on information from the National Concrete Masonry Association Publication TEK-35A.

#### Licensing Actions

- None

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"

#### Supporting EEEEs

EM 71592

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-2601.337-844-078, Rev. F, "Seismic Gap Seal/GS-1, 2"
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

### **References**

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|---|---|
| <ul style="list-style-type: none"> <li>- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations El. 735'-6""</li> <li>- 8700-01.062-0065, Rev. A, "Fire Risk Evaluation of Pipe Tunnel (1-PT-1)"</li> <li>- 8700-10.001-0708, Rev. C, "Quench Spray Pump and Aux. Feed Pump EL 735'-6" Floor Pens. Fire Walls &amp; Data"</li> <li>- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"</li> <li>- 8700-B-084, Rev. 12, "Fire Hazards Analysis"</li> <li>- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"</li> <li>- 8700-RA-0025EK, Rev. 1, "Block Wall CV 2-2 Cable Vault Area El. 735'-6""</li> <li>- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room &amp; Misc Areas"</li> <li>- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"</li> <li>- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"</li> <li>- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"</li> <li>- TER 11815, Rev. 1, "Main Steam Fire Area MS-1 Seismic Gap (Fire &amp; Flood) Seals"</li> </ul> | <ul style="list-style-type: none"> <li>- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"</li> <li>- 8700-01.062-0066, Rev. A, "Fire Risk Evaluation of Quench Spray / AFW Pump Room (1-QP-1)"</li> <li>- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"</li> <li>- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault &amp; Safeguards Areas, Adjacent to Containment"</li> <li>- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"</li> <li>- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"</li> <li>- 8700-RA-0025F, Rev. 1, "Block Wall Location Plan, Cable Vault El. 735'6""</li> <li>- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"</li> <li>- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"</li> <li>- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"</li> <li>- EM 71592, "Fire Rating of Block Walls"</li> <li>- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"</li> </ul> |
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### **Open Items and VFDRs**

<b>VFDR Number</b>	BV1-0987	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

#### **Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-QP-1**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

Door MS35-5 is between 1-CV-1 and 1-QP-1, and is a 3-hour rated fire door. This door is inspected periodically per procedures.

Fire Dampers:

The fire dampers associated with the boundaries of 1-QP-1 with other fire compartments are 1VS-D-145, 1VS-D-146, 1VS-D-147, 1VS-D-154, and 1VS-D-187. These fire dampers are periodically inspected per procedures.

Complies with Clarification

Fire Doors:

Door MS35-4 is not fire rated and is located between 1-QP-1 and 1-PT-1. Part of the fire barrier separation between compartments 1-PT-1 & 1-QP-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Fire Dampers:

Dampers 1VS-D-145, 1VS-D-146, and 1VS-D-147 are not UL qualified but are included in the performance-based approach.

Complies with Use of EEEE

Fire Dampers:

Damper 1VS-D-154 was evaluated and was concluded to be adequate for the hazard.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0065, Rev. A, "Fire Risk Evaluation of Pipe Tunnel (1-PT-1)"
  
- 8700-10.001-0708, Rev. C, "Quench Spray Pump and Aux. Feed Pump EL 735'-6" Floor Pens. Fire Walls & Data"
- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault & Safeguards Areas, Adjacent to Containment"
- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RA-0025F, Rev. 1, "Block Wall Location Plan, Cable Vault EL. 735'6"
  
- 8700-RB-5P, Rev. 9, "Air Cooling Pipe Tunnel, Cable Vault & Misc Areas Sh. 14"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
  
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
  
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- TER 11815, Rev. 1, "Main Steam Fire Area MS-1 Seismic Gap (Fire & Flood) Seals"

**Supporting FEEEs**

FPPCE 12-024 Rev.0 Part D

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-2601.337-844-078, Rev. F, "Seismic Gap Seal/GS-1, 2"
  
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
  
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations EL. 735'-6"
- 8700-01.062-0049, "Engineering Evaluation of Compartment Boundry between 1-PT-1 & 1-QP-1"
- 8700-01.062-0066, Rev. A, "Fire Risk Evaluation of Quench Spray / AFW Pump Room (1-QP-1)"
- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls EL. 751'-0" - 756'-0"
- 8700-10.001-0720, Rev. G, "Main Steam & MCC Room Data Sheet"
  
- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
  
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0025EK, Rev. 1, "Block Wall CV 2-2 Cable Vault Area EL. 735'-6"
- 8700-RB-5L, Rev. 12, "Air Cooling Pipe Tunnel, Cable Vault & Misc Area Sh. 11"
- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"
  
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- BVS-346 Dated Nov. 10, 1972, Rev. 2, "Concrete and Lightweight Concrete Block Masonry"
- EM 71592, "Fire Rating of Block Walls"
  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-0987	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-QP-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- None

**Supporting EEEEs**

8700-DMC-2653 Eval.#12 R2 A1

FPPCE 13-011 Rev.0

**References**

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations El. 735'-6"
- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls El. 751'-0" - 756'-0"
- 8700-10.001-0720, Rev. G, "Main Steam & MCC Room Data Sheet"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"
- 8700-10.001-0708, Rev. C, "Quench Spray Pump and Aux. Feed Pump EL 735'-6" Floor Pens. Fire Walls & Data"
- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Item Number**      BV1-0714      **Item Title:** Complete Penetration Seal Database

**VFDR Number**      BV1-0987      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-RC-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**       3.8.2 - Detection

**Compliance Basis:**

The reactor containment, 1-RC-1, is provided with partial coverage area fire detection in the two specific areas of the east and west redundant cable penetration areas and the RHR pump area. Detection in these two areas of 1-RC-1 was previously approved in the SER dated 1983-03-14. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

Complies

Item 1 through 10 with the exception of Items 1 and 3.

2. The presence of platforms in containment is not applicable because only partial coverage area fire detection in two specific areas is provided.
4. Confirmed that fire detectors in 1-RC-1 are tested periodically.
5. Confirmed in this area that there are no air duct fire detectors.
6. Confirmed in this area that there are no fire detectors utilized to release fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that the circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that the control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies by Prior Approval

1. The detectors in these limited areas are uniquely located above the protected hazards. Limited area detection for 1-RC-1 was previously approved in the SER

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

dated 1983-03-14.

3. Detection in only these two areas of 1-RC-1 (cable penetration area and RHR pump area) was previously approved in the SER dated 1983-03-14.

Will Comply with use of Commitment

3. The detectors in these limited areas are uniquely located above potential specific fire hazards. A field verification will be completed to confirm hazard protection is acceptable.

**Licensing Actions**

- 11.02 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10ST-33.21A, Rev. 8, "Cont Area Smoke Detection Instrumentation Test"  
- 8700-01.080-0051, Rev. C, "Exposed Conduit Reactor Containment @ El 735'6", El 756'11", El 767'10"  
- 8700-RE-0001Z, Rev. 30, "Vital Bus and DC One Line Diagram"  
- 8700-RE-0009JC, Rev. 17, "Wiring Diagram MCC 1-9 Turbine Room"  
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"  
- 8700-RE-0064JQ, Rev. 1, "Cable Block Diagram - Fire Detection DGP-3, 4, & 5"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 10ST-33.21, Rev. 7, "Containment Fire Protection System Refueling Outage Test"  
- 8700-01.080-0037, Rev. C, "Exposed Conduits for Smoke Detectors, Reactor Cont. @El.735'6" & 738'10" DCP 268"  
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"  
- 8700-RE-0009HD, Rev. 15, "480V MCCI-E9"  
- 8700-RE-0064B, Sht. 2, Rev. 15, "PLAN-FIRE ALARM & SECURITY ALARM"  
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"  
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2826	<b>Item Title:</b> 1-RC-1 /3.8.2 Perform fire detector spacing verification
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-RC-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:**     3.9.1 - NFPA Standards

##### Compliance Basis:

Fire compartment 1-RC-1 has three remotely operated, manually actuated, fixed water spray systems. The two Containment Cable Penetration Areas each utilize a deluge system with open directional water spray nozzles. The RHR Pump and Heat Exchanger Area has a preaction system utilizing closed, heat responsive directional water spray nozzles. These are special designed systems for pump protection or cable protection and are not area suppression systems. All three systems are required to support NRC prior approvals, but only the RHR system is required for PRA risk reduction.

Complies by Prior Approval

These three fixed water spray systems are the only required systems in Containment, as previously approved by the NRC and documented in NRC SER dated 1984-08-30.

Complies

Containment Cable Penetration Area/Residual Heat Removal Pump and Heat Exchanger Area

1. A vendor calculation depicts the flow and pressure requirements for the systems, which are well within the available supply.
2. The water spray density for this system meets the minimum acceptable criteria for this hazard per the design standard. (see commitment below)
3. Piping and fittings are designed for the required working pressure.
4. Piping and fittings are protected from corrosion.
5. The directional spray nozzles are UL listed and FM approved.
6. There is a main pipeline strainer for this system.
7. Individual nozzle strainers are not required because the nozzle passageways are larger than 1/8 inch.
8. Unapproved gasketed fittings are not used in the design of the suppression system.

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 1

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

10. The automatic detection equipment is electrically supervised for waterflow, trouble, and alarm, indicating locally and on the Main Control Room annunciator panel.

11. Primary and secondary power sources are addressed in NFPA 805 Transition Record 3.8.1.

12. The compensatory measure shown in 1/2-ADM-1900 for system impairment is appropriate for the level of importance of this system.

Will Comply with the Use of Commitment

2. The nozzles and actuation devices for hazard protection in the Containment Cable Penetration Areas and RHR Pump Area will be evaluated to assess whether the spray pattern and time to detection can provide a more effective spray pattern or quicker response to protect the hazard. Plant documentation indicates that the cable penetration deluge system nozzles are arranged for effective coverage of the cable penetration area. A walkdown is planned per Open Item BV1-2826.

9. Verification of system actuation within 20 seconds after heat detector activation will be included in procedures.

#### Licensing Actions

- 11.02 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation (III.G.2 criteria)
- 11.16 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation of Redundant Trains of Circuits Assoc'd with Source Range Monitoring Within Containment (III.G.2 criteria)

#### References

- "BVPS-1 NFPA 805 Feasibility Study Report"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OST-33.13B, Rev. 14, "Deluge Valve Fire Protection System Instrument Test"
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50 "
- 8700-10.001-0473, Rev. B, "Fire Protection, RHR Area Water Deluge Control Panel Arrangement and Elementary"
- 8700-10.001-0487, Rev. A, "Fire Protection System Flow Calculation for RC-1 / RHR Pump Area"
- 8700-10.001-0489, Rev. A, "Fire Protection System Flow Calculation for RC-1 / Purple Penetration Area"
- 8700-6.24-3708, Sht. 1, Rev. 1, "Cable Penetration Sprinkler Risers A & B"
- 8700-DMC-3079, Rev. 1, "Fire Pump Minimum Operating Curve"
- 8700-RB-0030E, Rev. 2, "BLDG SERV SH 5 CABLE VAULT & SAFEGUARD AREA"

#### Supporting EEEs

- None

- 1/2-PIP-M14, Rev. 10, "Pipe Classes For Use On BV-1 And BV-2"
- 1OM-33.5.B.1, Rev. 2, "Table 33-1 Deluge Valve Protected Areas"
- 1OST-33.21, Rev. 7, "Containment Fire Protection System Refueling Outage Test"
- 8700-10.001-0472, Rev. D, "Unit 1 Reactor Containment Building Extinguishment Control Panel Wiring"
- 8700-10.001-0485, Rev. A, "Fire Prot. System Water Flow Calc. for PT-1, Auxiliary Feedwater Pump Area"
- 8700-10.001-0488, Rev. A, "Fire Protection System Flow Calculation for RC-1 / Orange Penetration Area"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-6.24-3709, Sht. 1, Rev. 1, "Cable Penetration Sprinkler Risers C & D"
- 8700-RB-0016C, Rev. 13, "Flow Diagram Fire Protection"
- 8700-RB-0030H, Rev. 1, "Fire Protection Sheet 8, Cable Vault and Safeguards Area"



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |   |  |
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| <ul style="list-style-type: none"> <li>- 8700-RB-0036E, Rev. 3, "Fire Protection Reactor Containment"</li> <li>- 8700-RE-18BB, Rev. 4, "Wiring Diagram Fire Protection, Water Deluge PNLs RE-WS-8A &amp; 8B, 11A"</li> <li>- 8700-RE-21QY, Rev. 10, "Elementary Diagram"</li> <li>- 8700-RV-0001E, Rev. 7, "Reactor Containment Electrical Penetrations"</li> <li>- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"</li> </ul> | <ul style="list-style-type: none"> <li>- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"</li> <li>- 8700-RE-21GW, Sht. 5, Rev. 7, "Elementary Diagram, Fire Protection (FP) "</li> <li>- 8700-RV-0001B, Sht. 1, Rev. 6, "Reactor Containment Piping Penetrations SH 1"</li> <li>- BVS-529, Rev. 0, "Sprinkler &amp; Water Spray Fire Protection Systems"</li> </ul> |
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**Open Items and VFDRs**

<b>Item Number</b>	BV1-2828	<b>Item Title:</b> Revise procedure 10ST-33.13B, Deluge Valve Fire Protection System Instrument Test, to define actuation criterion
<b>Item Number</b>	BV1-2826	<b>Item Title:</b> 1-RC-1 /3.8.2 Perform fire detector spacing verification

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 1

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment -** 1-RC-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.2 - Water Flow Alarm

#### **Compliance Basis:**

The RHR Pump and Heat Exchanger Area is provided with a single flow alarm device on its deluge valve that sends its alarm signal to the local and main control room alarm panels.

The Containment Cable Penetration area water spray systems supply deluge valve DV-1FP-14 trim is provided with a water flow detection devices as well as each deluge valve for the orange and purple cable penetration areas. These water flow alarm signals are sent to a local and the main control room panels.

#### Licensing Actions

- 11.02 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation (III.G.2 criteria)
- 11.16 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation of Redundant Trains of Circuits Assoc'd with Source Range Monitoring Within Containment (III.G.2 criteria)

#### Supporting EEEEs

- None

#### References

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 8700-10.001-0472, Rev. D, "Unit 1 Reactor Containment Building Extinguishment Control Panel Wiring"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"
- 8700-RM-0433-7, Sht. 7, Rev. 14, "Valve OPER NO Diagram - Fire Protection Details"
- 10M-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-10.001-0473, Rev. B, "Fire Protection, RHR Area Water Deluge Control Panel Arrangement and Elementary"
- 8700-RB-16C, Rev. 12, "Flow Diagram Fire Protection"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"
- 8700-RM-0433-008, Rev. 14, "Valve OPER NO DIAGRAM FP Details"

#### Open Items and VFDRs

- None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 1

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - 1-RC-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

#### Compliance Basis:

All three of the containment water spray systems send their alarms signals to the main control room and a local panel.

#### Licensing Actions

- 11.02 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation (III.G.2 criteria)
- 11.16 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation of Redundant Trains of Circuits Assoc'd with Source Range Monitoring Within Containment (III.G.2 criteria)

#### References

- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-10.001-0473, Rev. B, "Fire Protection, RHR Area Water Deluge Control Panel Arrangement and Elementary"
- 8700-RE-18BB, Rev. 4, "Wiring Diagram Fire Protection, Water Deluge PNLS RE-WS-8A & 8B, 11A"

#### Supporting EEEEs

- None

- 8700-10.001-0472, Rev. D, "Unit 1 Reactor Containment Building Extinguishment Control Panel Wiring"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"

#### Open Items and VFDRs

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-RC-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.5 - OS&Y gate valve

**Compliance Basis:**

The containment fire protection water systems supply lines are equipped with OS&Y valves and deluge valves outside containment as well as an additional air operated valve that is installed for "containment integrity".

**Licensing Actions**

- 11.02 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation (III.G.2 criteria)
- 11.16 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation of Redundant Trains of Circuits Assoc'd with Source Range Monitoring Within Containment (III.G.2 criteria)

**References**

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"

**Supporting EEEs**

- None

- 10M-33.5.B.1, Rev. 2, "Table 33-1 Deluge Valve Protected Areas"
- 8700-RB-16C, Rev. 12, "Flow Diagram Fire Protection"
- 8700-RM-0433-7, Sht. 7, Rev. 14, "Valve OPER NO Diagram - Fire Protection Details"

**Open Items and VFDRs**

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-RC-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.6 - Valve Performance

**Compliance Basis:**

The OS & Y control valves for the Cable Penetration Area, the RHR Pump and HX Area, the inlet valves to both strainers, and the respective containment penetration air operated isolation valves are provided with position indication in the main control room. This meets option (a) from Section 3.5.14 of NFPA 805 which requires "Electrical supervision with audible and visual signals in the main control room or other suitable constantly attended location."

**Licensing Actions**

- 11.02 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation (III.G.2 criteria)
- 11.16 Reactor Containment (1-RC-1) - Lack of 20 ft. Separation of Redundant Trains of Circuits Assoc'd with Source Range Monitoring Within Containment (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"
- 8700-10.001-0516, Rev. A, "RC Aux Feedwater Pumps & Penetration Fire Protection System"
- 8700-RE-0021QX, Rev. 12, "Building Service Panel Annunciator A12 and A13 Window Arrangement"
- 8700-RE-21QY, Rev. 10, "Elementary Diagram"
- 8700-RM-0433-7, Sht. 7, Rev. 14, "Valve OPER NO Diagram - Fire Protection Details"
- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 8700-10.001-0472, Rev. D, "Unit 1 Reactor Containment Building Extinguishment Control Panel Wiring"
- 8700-RB-16C, Rev. 12, "Flow Diagram Fire Protection"
- 8700-RE-21GW, Sht. 5, Rev. 7, "Elementary Diagram, Fire Protection (FP) "
- 8700-RM-0433-002, Rev. 20, "Valve OPER NO Diagram FP Water"

**Open Items and VFDRs**

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-RC-1**

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

1-RC-1 is not specifically identified in the inspection procedure as an area required to be included in the inspection; however, a general observation of the accessible interior and exterior surfaces as well as a pressurized leak test demonstrate the integrity of the primary containment.

The containment structure perimeter consists of a 10-ft concrete mat, with 4-ft 6-in thick reinforced concrete walls to the dome transition that is a minimum thickness of 2 ft 6 in of reinforced concrete. A continuous steel liner is provided on the entire interior to assure leak tightness of the structure. A BV1 calculation states that the concrete represents a 3 hour fire barrier.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 1BVT 1.47.10, Rev. 20, "Equipment Hatch Emergency Airlock Type B Test"
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-B-084, Rev. 12, Add. 1, "Fire Hazards Analysis"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 1BVT 1.47.2, Rev. 7, "Containment Type A Leak Test"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"
- 8700-RM-416-001, Rev. 14, "P&ID, Vent & Air Cond, Primary Plant"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-RC-1**

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 ~ Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

The equipment hatch and sub-assembly of the "emergency air lock", and the personnel air lock although not fire rated by UL are designed to withstand severe accident conditions that would typically exceed UL fire test standards and as such should be considered capable of providing adequate separation for adjacent fire areas. They are periodically tested to demonstrate the integrity of containment.

Fire Dampers:

This requirement is not applicable to the purge duct system, which is actually a piping system. This system is tested for leaks whenever containment vacuum has been broken.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 1BVT 1.47.1, Rev. 12, "Containment Structural Integrity Test"  
- 1BVT 1.47.12, Rev. 7, "Containment Purge Supply/Exhaust and Vacuum Ejector Containment Isolation Valve Position Test"  
- 1BVT 1.47.8, Rev. 19, "Personel Airlock Type B Leak Test"  
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"  
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"  
- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"  
- 8700-RM-416-001, Rev. 14, "P&ID, Vent & Air Cond, Primary Plant"  
- UFSAR, Rev. 27, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"

- 1BVT 1.47.10, Rev. 20, "Equipment Hatch Emergency Airlock Type B Test"  
- 1BVT 1.47.2, Rev. 7, "Containment Type A Leak Test"  
- 1OST-47.2, Rev. 38, "Containment Penetration Verification"  
- 8700-B-084, Rev. 12, Add. 1, "Fire Hazards Analysis"  
- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"  
- 8700-RB-2M, Rev. 12, "Fire Protection Arrangement"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None



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

### Fire Protection Features

#### Transition Report

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

Beaver Valley Unit 1

**Fire Compartment** - 1-RC-1

**Compliance Statement:** Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

#### **Compliance Basis:**

Complies with use of EEEE:

FPPCE 12-088 was issued which concludes that the installed configurations of both Unit 1 and Unit 2 EPAs are adequate for the hazard presented in the fire areas.

#### **Licensing Actions**

- None

#### **Supporting EEEEs**

FPPCE 12-088 Rev.0

#### **References**

- 1BVT 1.47.4, Rev. 14, "Containment Electrical Penetrations Type "B" Leak Test"  
- UFSAR, Rev. 27, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"

- BVS-0384, Rev. 3, "Containment Electrical Penetrations"

#### **Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-S-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 2 hour fire rating. Barriers for this fire compartment range from 8 inches of masonry block to 24 of reinforced concrete. This is considered adequate for the hazard due to the fire loading in the Primary Auxiliary Building and 1-S-1.

Complies with use of EEEE

Parts of the wall are constructed of 8 inch concrete masonry block and evaluated to show the equivalent thickness of a 8-inch block wall at BV1 is greater than the equivalent thickness of a block wall with a 2-hour fire rating.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire barriers required for separation into the periodic inspection procedures, per Attachment S.

**Licensing Actions**

- None

**Supporting EEEEs**

EM 71592

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 8700-RA-0010F, Rev. 3, "Stairs & Details Auxiliary BLDG."
- 8700-RC-0024H, Rev. 16, "Plan EI 735'-6" - Outline, Auxiliary Building"
- 8700-RC-0024M, Rev. 15, "plan EI. 768-7 - Outline Auxiliary Building"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RC-0024B, Rev. 16, "Plan FDN. MAT. EL. 722'-6" - Outline Auxiliary Building"
- 8700-RC-0024K, Rev. 13, "Plan EI. 752-6 - Outline Auxiliary Building"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>Item Number</b>	BV1-3041	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-S-1**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

Drawings and door schedules identify doors as 1.5 rated.

Fire doors were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Fire Dampers:

The non-fire-rated dampers from the mechanical room of the elevator shaft on the 784'-11" elevation to the outside pose no credible risk to the spread of fire to another fire compartment.

Complies with Clarification

Fire Doors:

The stairwell doors leading to the different elevations of the PAB and elevator shaft doors are 1.5-hour rated doors on the east wall of 1-S-1. The acceptability of the separation was evaluated using performance-based methods.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire dampers and doors required for separation into the periodic inspection procedures, per Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 77-04-29, "BV1, Fire Protection Program Review APCSB 9.5-1 Appendix A"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0017E, Sht. 5, Rev. 9, "Plans & Sections Service Building"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-RA-0010F, Rev. 3, "Stairs & Details Auxiliary BLDG."

**Open Items and VFDRs**

<b>Item Number</b>	BV1-3041	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-S-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with Clarification

The absence of fire-rated penetration seals around the fire dampers does not pose a credible risk to the spread of fire at the upper elevation since the adjacent compartment is the outside.

Complies with use of EEEE

Penetration seal PAB-735-0036 is adequate for the hazard due to the negligible fixed or transient fire compartment loading in 1-S-1 and low, less than one hour, fire loading in 1-PA-1E.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized and fire barriers with adjacent compartments will be added to inspection procedures per Attachment S.

**Licensing Actions**

- None

**Supporting EEEEs**

FPPCE 13-010 Rev.0

**References**

- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"

- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-3041	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 1

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 1-SB-GEN

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

##### Compliance Basis:

Complies

This fire barrier where it interfaces with safety-related areas has an acceptable rating and thickness. Most of the walls and floors consist of concrete block and reinforced concrete which range from 8 to 36 inches thick. A portion of the wall on the uppermost elevation of this compartment has walls constructed of metal siding.

Complies with use of EEEE

Parts of the wall are constructed of 8 inch concrete masonry block and evaluated to show the equivalent thickness of a 8-inch block wall at BV1 is greater than the equivalent thickness of a block wall with a 2-hour fire rating that are coupled with 1.5 hour fire rated doors.

Will Comply with the Use of Commitment

Attachment S tracks the procedure update to the periodic inspection procedures of the fire barriers required for separation.

#### Licensing Actions

- None

#### Supporting EEEs

8700-DMC-2653 Eval. #3 & #4 R2 A1  
EM 71592

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- 8700-RA-0001D, Sht. 1, Rev. 17, "Floor Plan Service Building"  
- 8700-RA-0008A, Rev. 3, "Plans, Sects & Dets Stairs- Serv. BLDG."  
- 8700-RC-0008F, Rev. 10, "Sections, Service Building"

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"  
- 8700-RA-0001B, Rev. 8, "Roof Plan SH 1 Auxiliary Bay & Service Bld"  
- 8700-RA-0001E, Sht. 2, Rev. 15, "Floor Plan- Auxiliary Bay & Service BLDG"  
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."  
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RC-0021C, Rev. 19, "Slab Plan el. 735-6 Cable Vault Area"

- 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" & 756'-0", Cable Vault Area"

- 8700-RC-0024K, Rev. 13, "Plan El. 752-6 - Outline Auxiliary Building"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-3041	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-SB-GEN

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

The boundary of 1-SB-GEN has doors of acceptable ratings, which include 1.5-hr, 3-hr and non-rated exterior door assemblies.

Fire doors were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

Complies with Use of EEEE

Fire Dampers:

Damper 1VS-D-194 has been reviewed and an engineering evaluation concluded the ductwork has the equivalent of a fire resistance rating of one hour.

Will Comply with the Use of Commitment

Attachment S tracks the procedure update to the periodic inspection procedures of the fire barriers required for separation.

**Licensing Actions**

- None

**Supporting EEEEs**

FPPCE 02-031 Rev.0  
FPPCE 06-038 Rev.0  
FPPCE 12-024 Rev.0 Part B  
FPPCE 13-030 Rev.0

**References**

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"  
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"

- 8700-RA-0001D, Sht. 1, Rev. 17, "Floor Plan Service Building"  
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 8700-RA-0010A, Rev. 7, "Floor Plans Auxiliary Building"
- 8700-RB-0017B, Sht. 2, Rev. 12, "Vent & Air Cond. EL. 752'-6" Service Building"
- 8700-RB-0017D, Rev. 14, "Vent. & Air Cond. El. 735'-6" Sh. 4"
- 8700-RB-0017F, Rev. 11, "Vent and Air Cond El. 713'-6" Service Building"
- 8700-RB-0017H, Rev. 10, "Vent & Air Cond El. 725'-6" Service Building Sh. 8"
- 8700-RB-0017M, Rev. 5, "Ventilation & Air Conditioning for Service Bldgs El. 735'-6""
- 8700-RB-0017A, Sht. 1, Rev. 10, "Vent. & Air Cond. EL. 735'-6" & 752'-6" Service Building"
- 8700-RB-0017C, Rev. 12, "Vent. & Air Cond El. 735'-6" Sh. 3 Service Building"
- 8700-RB-0017E, Sht. 5, Rev. 9, "Plans & Sections Service Building"
- 8700-RB-0017G, Sht. 7, Rev. 11, "Vent and Air Cond El 713'-6" Service Building"
- 8700-RB-0017L, Rev. 11, "Vent & Air Cond. El. 725'-6" Service Building Sh. 11"
- TER 00306, "Vendor Technical Information for Replacement Fire Dampers VS-D-259 and 260"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-3043	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

<b>Item Number</b>	BV1-3041	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

#### Fire Compartment - 1-SB-GEN

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

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

#### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

An unsealed penetration exists between 1-SB-GEN and 1-TB-1 in the upper room where the feedwater and main steam pipes are located that will be evaluated or sealed per BV1-3043.

An open item has been created to incorporate the inspection of the fire penetration seals required for separation into the periodic inspection procedures, per Attachment S.

#### Licensing Actions

- None

#### Supporting EEEEs

FPPCE 13-010 Rev.0

FPPCE 13-011 Rev.0

#### References

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"  
- 8700-01.035-0169, Rev. J, "West Cable Vault EL. 735'-6" Wall and Floor Penetrations"  
- 8700-01.035-0171, Rev. F, Add. 1, "West Cable Vault- Wall and Floor Penetrations EL. 735'-6"  
- 8700-10.001-0668, Rev. H, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Walls"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"  
- 8700-01.035-0170, Rev. F, "West Cable Vault EL 735'-6" Wall and Floor Penetrations"  
- 8700-10.001-0480, Rev. Z, "Turbine Bldg. & Pipe Tunnel - EL. 722'-6" Service Water"  
- 8700-10.001-0669, Rev. M, "Control Room EL. 735'-6" 3 HR. Fire Rated Floor and Walls"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-10.001-0670, Rev. K, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Wall"
- 8700-10.001-0682, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0684, Rev. F, "PAB North Wall Penetrations All Elevations"
- 8700-10.001-0691, Rev. D, "East Cable Bault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0708, Rev. C, "Quench Spray Pump and Aux. Feed Pump EL 735'-6" Floor Pens. Fire Walls & Data"
- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0""
- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"
- 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"
- 8700-10.001-1103, Rev. A, "Penetration Seal Identification Service Bldg., EI 752'-6""
- 8700-10.001-0680, Rev. E, "Normal 4KV Switchgear EL 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0683, Rev. E, "Emergency Switchgear Rooms 1 & 2 EL. 713'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0685, Rev. F, "P.A.B North Wall Data Sheet All Elevations"
- 8700-10.001-0693, Rev. E, "East Cable Vault EL. 735'-6" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"
- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls EL. 751'-0" - 756'-0""
- 8700-10.001-0720, Rev. G, "Main Steam & MCC Room Data Sheet"
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room EL. 722'-6" and EL. 735'-6", 3 HR Fire Rated Walls"
- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"
- 8700-10.001-1099, Rev. C, "Penetration Seal Tables for Service Building EL. 735'-6""
- 8700-10.001-1120, Rev. C, "Fire Area CS-1, Access to Ceiling Penetrations"

##### Open Items and VFDRs

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
<b>Item Number</b>	BV1-3041	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-3043	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-SGPD-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.2 - Fire barriers

**Compliance Basis:**

Complies:

The minimum barrier thickness for this area is 12 inches. The fire loading for this area determined that a fire barrier of less than 1/2 hour was required. Fire area SGPD-1 has an overall fire barrier rating (perimeter) of 1 hour.

The fire barriers were confirmed to be periodically inspected for this fire area.

Complies with Use of EEEE:

1-SGPD-1 shares seismic shake spaces with the Primary Auxiliary Building fire compartment 1-PA-1A. The shake space configurations, in conjunction with seals provided within the openings, were evaluated to be adequate for the hazards.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1OM-54.3.L3-1-2 , Rev. 1, "Non-Security Related Fire Door Check"
- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"
- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"
- 8700-10.001-1009, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"
- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.035-0173, Rev. E, "Blowdown Room and Airlock EL. 767'-6" - EL. 768'-6" 3 HR. Fire Rated Walls & Floors"
- 8700-10.001-0697, Rev. B, "Primary Auxiliary Building EL. 768'-7" Floor Penetrations"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-10.001-1010, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-10.001-1011, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"
- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault & Safeguards Areas, Adjacent to Containment"
- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"
- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room & Misc Areas"
- 8700-RC-0021E, Rev. 10, "Slab Plan EL 762'-9 5/8" & EL 767'-10" Cable Vault Area"
- 8700-RM-0063C, Rev. 4, "Penetration Seals El. 752'-6"
- 90-06-29, "BVPS-1 – Unqualified Fire Damper Engineering Evaluation (TAC 66319)"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- TER 11815, Rev. 1, "Main Steam Fire Area MS-1 Seismic Gap (Fire & Flood) Seals"
- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0008B, Rev. 3, "Plans. Sects & Dets- Stairs Serv. Bldg & Cable Vault"
- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"
- 8700-RC-0021D, Rev. 15, "Slab Plan El. 751'-0" & 756'-0", Cable Vault Area"
- 8700-RC-0021K, Sht. 4, Rev. 11, "Sections Cable Vault Area"
- 89-12-19, "BVPS-1 (TAC 56566) – Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"
- DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

##### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-SGPD-1

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire doors and dampers were confirmed to be periodically inspected by administrative procedures and maintenance preventative tasks.

Fire Doors:

Door MC68-1 between 1-SGPD-1 and 1-PA-1A is a 3 hour fire rated door.

Door MC69-2 between 1-SGPD-1 and the cable vault stairwell, S-2 is a 1.5 hour fire rated door.

Door MC69-1 in that same stairwell leads to the roof and is an unrated door.

Door MC56-2 between 1-SGPD-1 and the same stairwell one elevation below is a 1.5-hour fire rated door. Door MC56-3 is internal to the 1-SGPD-1 area and is not a fire door.

Fire Dampers:

Damper 1VS-D-168 is 3-hour fire rated.

Complies by Prior Approval

Fire Doors:

Door MC68-1 was identified as having a security modification of a security card reader system and was granted a NRC exemption in letter dated December 4, 1986..

Complies with Use of EEEE

Fire Dampers:



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

### Fire Protection Features Transition Report

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

Dampers 1VS-D-165, 1VS-D-166, 1VS-D-167, 1VS-D-170, 1VS-D-171, 1VS-D-172, 1VS-D-173, 1VS-D-174, 1VS-D-175, 1VS-D-176, 1VS-D-178, and 1VS-D-179 were evaluated to be acceptable. Engineering evaluations concluded the ductwork has the equivalent of a fire resistance rating of one hour.

#### **Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### **Supporting EEEs**

- FPPCE 12-024 Rev.0 Part A
- FPPCE 12-024 Rev.0 Part E
- FPPCE 12-024 Rev.0 Part F

#### **References**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"</li> <li>- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"</li> <li>- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"</li> <li>- 1OM-54.3.PAB1, Rev. 39, "PAB Log Readings"</li> <li>- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"</li> <li>- 85-01-14, "Appendix R - Additional Exemption Requests"</li> <li>- 8700-01.035-0173, Rev. E, "Blowdown Room and Airlock EL. 767'-6" - EL. 768'-6" 3 HR. Fire Rated Walls &amp; Floors"</li> <li>- 8700-10.001-0697, Rev. B, "Primary Auxiliary Building EL. 768'-7" Floor Penetrations"</li> <li>- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"</li> <li>- 8700-10.001-1010, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"</li> <li>- 8700-10.001-1117, Sht. 1, Rev. A, "Shake Space Elev. - Cable Vault and Safeguards Areas. Adjacent to Containment"</li> <li>- 8700-B-084, Rev. 12, "Fire Hazards Analysis"</li> <li>- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"</li> <li>- 8700-RA-0008B, Rev. 3, "Plans. Sects &amp; Dets- Stairs Serv. Bldg &amp; Cable Vault"</li> <li>- 8700-RB-0002P, Rev. 6, "Fire Protection Arrangement"</li> <li>- 8700-RC-0021D, Rev. 15, "Slab Plan EL. 751'-0" &amp; 756'-0", Cable Vault Area"</li> <li>- 8700-RC-0021K, Sht. 4, Rev. 11, "Sections Cable Vault Area"</li> <li>- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"</li> </ul> | <ul style="list-style-type: none"> <li>- 1/2-PIP-M16, Rev. 9, "Penetration Seals"</li> <li>- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"</li> <li>- 1OM-54.3.L3-1-2 , Rev. 1, "Non-Security Related Fire Door Check"</li> <li>- 1OST-33.13C, Rev. 10, "Ten Ton CO2 Fire Protection System Test"</li> <li>- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"</li> <li>- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"</li> <li>- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"</li> <li>- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"</li> <li>- 8700-10.001-1009, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"</li> <li>- 8700-10.001-1011, Rev. A, "Fire Damper VS-D-168 Installation and Fabrication Details"</li> <li>- 8700-10.001-1118, Sht. 2, Rev. A, "Shake Space Elev. - Cable Vault &amp; Safeguards Areas, Adjacent to Containment"</li> <li>- 8700-DMC-2653, Rev. 2, "Analysis of Untested Fire Seal Design"</li> <li>- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"</li> <li>- 8700-RB-0002N, Rev. 5, "Fire Protection Arrangement"</li> <li>- 8700-RB-0005M, Sht. 12, Rev. 12, "Air Cooling Main Steam Valve Room &amp; Misc Areas"</li> <li>- 8700-RC-0021E, Rev. 10, "Slab Plan EL 762'-9 5/8" &amp; EL 767'-10" Cable Vault Area"</li> <li>- 8700-RM-0063C, Rev. 4, "Penetration Seals EL. 752'-6"</li> </ul> |
|---|---|

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |  |   |
|--|---|
| - 90-06-29, "BVPS-1 – Unqualified Fire Damper Engineering Evaluation (TAC 66319)"                | - 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers" |
| - CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco" | - DCP-1482, Rev. 0, "Group 1 Fire Damper Replacement"                     |
| - TER 11815, Rev. 1, "Main Steam Fire Area MS-1 Seismic Gap (Fire & Flood) Seals"                |   |

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-SGPD-1

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

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

#### **Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEEs

FPPCE 13-011 Rev.0

#### References

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0694, Rev. D, "P.A.B West Wall Penetrations"

- 8700-10.001-0697, Rev. B, "Primary Auxiliary Building EL. 768'-7" Floor Penetrations"

- 8700-10.001-0718, Rev. J, "Main Steam Valve and MCC Room 3 HR Fire Rated Floors & Walls EL. 751'-0" - 756'-0"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-01.035-0173, Rev. E, "Blowdown Room and Airlock EL. 767'-6" - EL. 768'-6" 3 HR. Fire Rated Walls & Floors"

- 8700-10.001-0695, Rev. J, "PAB West Wall Penetrations Data Sheet"

- 8700-10.001-0709, Rev. D, "Purge Duct and Vent Room EL. 756'-0" 3 HR. Fire Rated Floor and Walls"

- 8700-10.001-0719, Rev. H, "Main Steam Valve MCC Room 3 HR. Fire Rated Floor and Walls EL. 752'-6" - 756'-0"

#### Open Items and VFDRs

Item Number	Item Title:
BV1-0714	Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-TB-1**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:**     3.9.1 - NFPA Standards

**Compliance Basis:**

The turbine building mezzanine (under the operating deck) and basement (under the mezzanine floor) areas are protected by a partial area automatic, supervised wet pipe sprinkler system. The turbine oil reservoir is protected by a deluge water spray system.

Complies:

The functionality of both of the sprinkler systems is met by the following:

1. It is confirmed that the system flow and density with simultaneous hose stream volume meet NFPA 13 requirements.
2. Fire department connections are not required because reverse flow through the hydrant system is used to back charge the suppression system.
3. The piping installation specification is compliant with NFPA 13.
4. The inspector's test connection has been confirmed.
5. The indicating type control valves are provided for the system and are discussed in 1-TB-1 3.9.5.
6. The hangers/supports are shown on the system design drawings.
7. The sprinkler heads' temperature rating complies with the standard.
9. In the system under the operating deck only, sprinkler heads positioned under grating type platforms predominantly have baffles where required.
10. The sprinkler systems are provided with water flow alarm devices that alarm locally and send signals to the main control room annunciator panel. Discussed in 1-TB-1 3.9.2.
11. The alarms annunciate to fire alarm panel located in the Control Room and on the annunciator windows in the Control Room. Discussed in 1-TB-1 3.9.3.
12. The sprinklers are installed an acceptable distance from the ceiling.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

14. The sprinkler deflectors are predominantly positioned correctly in accordance with the NFPA 13.

15. Return bends are not applicable per NFPA 13 Section 3067.

16. Because this is not a pre-action system, review/confirmation of the supervisory air for the piping and the supervisory alarm to the main control room is N/A.

17. Primary and secondary power sources are addressed by NFPA 805 Transition Record 3.8.1.

18. The compensatory measure shown in 1/2-ADM-1900 is appropriate for the level of importance for this system.

The functionality of the turbine oil reservoir deluge system is met by the following:

1. It is confirmed that the system flow and density meet NFPA 15 requirements.

2. The water spray density is in accordance with NFPA 15 Chapter 4.

3. The piping and fittings are designed for 175 psig cold water working pressure.

4. Piping and fittings are galvanized.

5. Spray nozzles are of an approved vendor make and type.

6. There is a main pipeline strainer.

7. Individual nozzle strainers are not required because all nozzles in this system are larger than 1/8 inch.

8. Unapproved gasketed fittings are not used in the design of the suppression system.

10. The automatic detection equipment is electrically supervised to result in positive notification of an abnormal condition of any devices or equipment upon which system actuation is dependent.

11. Primary and secondary power sources are addressed by NFPA 805 Transition Record 3.8.1.

12. The compensatory measure shown in 1/2-ADM-1900 is appropriate for the level of importance for this system.

Complies with Clarification:

8. For the sprinkler system under the mezzanine floor, the configuration of a sheet metal platform suspended below the turbine mezzanine was concluded to be acceptable in FPPCE 13-032.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

8. Both sprinkler systems have locations where obstructions such as cable trays are within the required 18 inch clearance below sprinklers. The sprinklers were analyzed in 8700-01.620-0085 and were concluded to be acceptable.

9. In the sprinkler system under the mezzanine floor, some areas contain sprinklers under grating type platforms that do not include baffles where required. The sprinklers were analyzed in 8700-01.620-0085 and were concluded to be acceptable, with the commitment as stated below.

13. Both sprinkler systems have several locations where the spacing and protection area is challenged. The sprinklers were analyzed in 8700-01.620-0085 and were concluded to be acceptable.

Will Comply with use of Commitment:

9. In the sprinkler system under the mezzanine floor, some areas contain sprinklers under grating type platforms that do not include baffles where required. The sprinkler heads located above the main condenser water box will have baffles (shields) reinstalled similar to the baffles on nearby sprinkler heads.

9. For the turbine oil reservoir deluge system, the procedure for testing the heat detection system actuation of the control valve will be revised to include a defined timed actuation criterion.

**Licensing Actions**

- None

**Supporting EEEs**

FPPCE 13-032 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2-PIP-M14, Rev. 10, "Pipe Classes For Use On BV-1 And BV-2"
- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 1OST-33.10A, Rev. 16, "Deluge Valve Test"
- 8700-01.062-0033, Rev. A, "Detailed Fire Modeling Report - Fire Compartment 1-TB-1"
- 8700-10.001-0291-B, Sht. 1, "Turbine Room"
- 8700-10.001-0293, Sht. 3, "Turbine Room"
- 8700-10.001-0295, Sht. 5, "Turbine Room"
- 8700-10.001-0297, Sht. 7, "Turbine Room"
- 8700-10.001-0299, Sht. 9, "Turbine Room"
- 8700-RM-0433-001, Rev. 20, "Valve Oper No Diagram Fire Protection Water"
- BVS-529, Rev. 0, "Sprinkler & Water Spray Fire Protection Systems"

- 1/2-ADM-2108, Rev. 2, "Mutual Aid and Emergency Response Plan"
- 1DBD-33B, Rev. 14, "Fire Protection System"
- 1OM-33.2.B, Rev. 11, "Setpoints"
- 1OST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"
- 8700-01.062-0085, Rev. A, "Performance Based Evaluation of the Unit 1 Turbine Building Sprinkler System Credited by the Detailed Fire Model"
- 8700-10.001-0292-C, Sht. 2, "Turbine Room"
- 8700-10.001-0294, Sht. 4, "Turbine Room"
- 8700-10.001-0296-A, Sht. 6, "Turbine Room"
- 8700-10.001-0298, Sht. 8, "Turbine Room"
- 8700-DMC-3079, Rev. 1, "Fire Pump Minimum Operating Curve"
- 8700-RM-433-7, Rev. 14, "Valve OPER NO DIAGRAM Fire Protection Details"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>Item Number</b>	BV1-2986	<b>Item Title:</b> Unit 1 Turbine Building Wet-Pipe Sprinkler Head Shield Reinstallation Modification
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment** - 1-TB-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.2 - Water Flow Alarm

**Compliance Basis:**

The turbine building is provided with a partial area automatic wet pipe sprinkler system protecting the mezzanine and basement of the turbine building. The turbine oil reservoir is provided with a deluge water spray system. Each system is provided with a water flow alarm.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10M-33.1.E, Rev. 12, "Specific Instrumentation & Controls"

- 8700-RM-433-7, Rev. 14, "Valve OPER NO DIAGRAM Fire Protection Details"

**Open Items and VFDRs**

-None



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

Fire Compartment - 1-TB-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

#### Compliance Basis:

The turbine building is provided with a partial area automatic wet pipe sprinkler system protecting the mezzanine and basement of the turbine building. The turbine oil reservoir is provided with a deluge water spray system. The alarms associated with these systems annunciate in the control room.

#### Licensing Actions

- None

#### Supporting EEEs

- None

#### References

- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"  
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"  
- 8700-RM-433-7, Rev. 14, "Valve OPER NO DIAGRAM Fire Protection Details"

- 1OST-33.10A, Rev. 16, "Deluge Valve Test"  
- 1OST-33.1B, Rev. 9, "Fire Protection System Water Flow and Drain Test"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-TB-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.5 - OS&Y gate valve

**Compliance Basis:**

The turbine building is provided with a partial area automatic wet pipe sprinkler system protecting the mezzanine and basement of the turbine building. The turbine oil reservoir is provided with a deluge water spray system. The supply piping to each system is provided with an OS&Y isolation valve. These valves are periodically inspected per procedures.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 1OST-33.10A, Rev. 16, "Deluge Valve Test"  
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"  
- 8700-RM-433-7, Rev. 14, "Valve OPER NO DIAGRAM Fire Protection Details"

- 1OST-33.12, Rev. 6, "Fire Protection System Valve Stroke Test"  
- 8700-10.001-0299, Sht. 9, "Turbine Room"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-TB-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.6 - Valve Performance

**Compliance Basis:**

The turbine building is provided with a partial area automatic wet pipe sprinkler system protecting the mezzanine and basement of the turbine building. The turbine oil reservoir is provided with a deluge water spray system. The controlling gate valve on the supply to each system meets the supervision requirements of NFPA 805 section 3.5.14.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 1OM-33.1.E, Rev. 12, "Specific Instrumentation & Controls"
- 1OST-33.1A, Rev. 13, "Fire Protection System Monthly Inspection"

- 1OST-33.10A, Rev. 16, "Deluge Valve Test"
- 8700-RM-433-7, Rev. 14, "Valve OPER NO DIAGRAM Fire Protection Details"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-TB-1

**Compliance Statement:**   Complies  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

Based on plant drawings, where the Turbine Building interfaces with other safety-related areas, the fire barriers are of acceptable rating and thickness.

Complies with Clarification

Part of the fire barrier separation between compartments 1-TB-1 and 1-TO-1, 1-TR-1, 1-TR-2, and 1-TR-3 use a performance-based approach in accordance with NFPA 805 section 3.11.1. Adequacy of the separation between these compartments is documented in the Generic Fire Risk Evaluation which includes the associated compartments and in the multi-compartment analysis report.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0001E, Sht. 3, Rev. 9, "Floor Plan - Service Building"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"
- 8700-RC-0002B, Rev. 12, "Foundation Mat-Outline Turbine BLDG"
- 8700-RC-0007A, Rev. 7, "Operating FL. Slab EL. 735'-6" Turbine BLDG"
- 8700-RC-0021A, Rev. 17, "Slab Plan El. 722'-6" & El. 725'-6" Cable Vault Area"
- TER 12157, Rev. 0, "BV-1 Permanent Plant Roofing System Replacement "

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-01.062-0069, Rev. A, "Fire Risk Evaluation of Turbine Building General Area (1-TB-1)"
- 8700-RA-0001D, Sht. 1, Rev. 17, "Floor Plan Service Building"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RC-0002H, Rev. 7, ""B" Line - Wall Sect's & Dets. Turbine Bldg."
- 8700-RC-0008A, Rev. 18, "Slab Plan at el. 713-6 Service Bldg."
- BVS-0416, Rev. 1, "Asphalt and Gravel Roofing and Flashing"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-3036	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-TB-1

**Compliance Statement:**   Complies  
                                      Complies by Previous Approval  
                                      Complies with Clarification  
                                      Complies with use of EEEE  
                                      Will Comply with the Use of Commitment

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies

Fire Doors:

Perimeter doors CV22-1, O35-2, S35-22, S35-23, S35-24, S35-26, S35-29, S35-35, S35-38, S35-45, S35-46, and T93-2 as 3-hour fire rated doors. These drawings also identify doors S13-1 and T93-1 as 1.5 hour fire rated doors that are acceptable due to the fire loading.

Fire doors and dampers are periodically inspected by procedure.

Complies by Previous Approval

Fire Doors:

Door CV22-1 was identified as having a security modification. Door O35-2 was identified as having a security modification as well as an unlabeled pressed metal frame. NRC letter dated December 4, 1986 granted exemptions based the fire severity rated calculated for the area.

Complies with Clarification

Fire Dampers:

An analysis found 1VS-D-272 and 1VS-D-273 between 1-TB-1 and 1-TO-1 to be acceptable due to fire loading, physical design and location, existence of suppression and dike to contain possible turbine oil spills.

Part of the fire barrier separation between compartments 1-TB-1 and 1-TO-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1. Adequacy of the separation between these compartments is documented in the Fire Risk Evaluation as well as the Generic Fire Risk Evaluation of the associated compartments and in the multi-compartment analysis report.

Will Comply

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Dampers:**

An open item has been created to verify the fire rating of fire dampers VS-D-200 and VS-D-358 between 1-TB-1 and 1-SB-GEN.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0033, Rev. A, "Detailed Fire Modeling Report - Fire Compartment 1-TB-1"
- 8700-10.001-0040A, "Turbine Room Exhaust Fans"
- 8700-RA-0001A, Rev. 5, "Roof Plan, Turbine Building"
- 8700-RA-0001E, Sht. 2, Rev. 15, "Floor Plan- Auxiliary Bay & Service BLDG"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RA-0008A, Rev. 3, "Plans, Sects & Dets Stairs- Serv. BLDG."
- 8700-RB-0013A, Sht. 1, Rev. 8, "Ventilation Turbine Area & Auxiliary Bay"
- 8700-RB-0017A, Sht. 1, Rev. 10, "Vent. & Air Cond. EL. 735'-6" & 752'-6" Service Building"
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"

**Supporting EEEs**

FPPCE 13-030 Rev.0

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OM-44F.1.B, Rev. 4, "Summary Description, Area Ventilation Systems - Miscellaneous Systems"
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0085, Rev. A, "Performance Based Evaluation of the Unit 1 Turbine Building Sprinkler System Credited by the Detailed Fire Model"
- 8700-10.001-0620, Rev. E, "Power Roof Ventilators Storage and Maintenance Instructions"
- 8700-RA-0001D, Sht. 1, Rev. 17, "Floor Plan Service Building"
- 8700-RA-0001F, Rev. 9, "Floor Plan EL. 713'-6" Service Building"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"
- 8700-RB-0013B, Sht. 2, Rev. 8, "Ventilation Turbine Area & Auxiliary Bay"
- 8700-RB-0017B, Sht. 2, Rev. 12, "Vent & Air Cond. EL. 752'-6" Service Building"
- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**VFDR Number**      BV1-3043      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

**VFDR Number**      BV1-3036      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:

NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-TB-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with Clarification:

Part of the fire barrier separation between compartments 1-TB-1 and 1-TO-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1. Adequacy of the separation between these compartments is documented in the Fire Risk Evaluation as well as the Generic Fire Risk Evaluation of the associated compartments and in the multi-compartment analysis report.

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized and fire barriers with adjacent compartments will be added to inspection procedures per Attachment S.

#### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### Supporting EEEs

FPPCE 13-011 Rev.0

#### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-01.062-0069, Rev. A, "Fire Risk Evaluation of Turbine Building General Area (1-TB-1)"

- 8700-10.001-0668, Rev. H, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Walls"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"

- 8700-10.001-0669, Rev. M, "Control Room EL. 735'-6" 3 HR. Fire Rated Floor and Walls"

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### References

- 8700-10.001-0671, Rev. C, "Relay Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0678, Rev. B, "Normal 4KV Switchgear EL 713'-6" 3 HR Fire Rated Floor and Walls"
- 8700-10.001-0724, Rev. F, "Safeguards and Vent Rms EL. 722'-6", EL. 732'-6" and EL. 735'-6" 3 HR. Fire Rated Walls"
- 8700-10.001-0760, Rev. F, "Cable Mezzanine Floor and Wall Penetrations"

- 8700-10.001-0673, Rev. C, "Process Rack Room EL. 713'-6 3HR Fire Rated Floor and Walls"
- 8700-10.001-0681, Rev. F, "Normal 4KV Switchgear EL. 713'-6" 3HR Fire Rated Floor and Walls"
- 8700-10.001-0725, Rev. J, "Safeguards and Vent Room EL. 722'-6" and EL. 735'-6", 3 HR Fire Rated Walls"
- 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"

##### Open Items and VFDRs

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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<b>VFDR Number</b>	BV1-3043	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

##### **Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-TO-1

**Compliance Statement:** Complies with Clarification  
Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

##### Compliance Basis:

Complies with Clarification

The roof of 1-TO-1 has a minimum thickness of 4 inches of concrete slab on top of 1.5 inch corrugated steel decking.

Part of the fire barrier separation between compartments 1-TB-1 and 1-TO-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1. Adequacy of the separation between these compartments is documented in the Fire Risk Evaluation as well as the Generic Fire Risk Evaluation of the associated compartments (8700-01.062-0069 & 8700-01.0620-0080) and in the multi-compartment analysis report (8700-01.062-0013).

Complies with use of EEEE

The north barrier has a minimum thickness of 12 inches of CMU block with the majority of the barrier having a thickness equal to or greater than 27 inches of concrete.

The west barrier has a minimum thickness of 12 inches of CMU block with the majority of the barrier having a thickness equal to 24 inches of concrete.

The floor of 1-TO-1 has a minimum thickness of 6 inches of concrete below grade on top of well compacted fill.

The south and east barriers are 12 inch thick CMU block resting on a 12 inch thick by 8 inch tall concrete curb. The parts of the wall that are constructed of 12 inch concrete masonry block are evaluated to show the equivalent thickness of a 12-inch block wall at BV1 is greater than the equivalent thickness of a block wall with a 4-hour fire rating based on information from the National Concrete Masonry Association Publication TEK-35A.

##### Licensing Actions

- None

##### Supporting EEEEs

EM 71592

##### References

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"  
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

- 10M-54.3.TURBINE1, Rev. 36, "Turbine Log Readings"  
- 8700-01.062-0069, Rev. A, "Fire Risk Evaluation of Turbine Building General Area (1-TB-1)"

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

### **References**

- |   |  |
|---|--|
| - 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments" | - 8700-RA-0001E, Sht. 2, Rev. 15, "Floor Plan- Auxiliary Bay & Service BLDG" |
| - 8700-RA-0009C, Rev. 8, "Misc. Det's Sh. 3, Turb. & Serv. Bldg"                | - 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"                       |
| - 8700-RC-0002H, Rev. 7, ""B" Line - Wall Sect's & Dets. Turbine Bldg."         | - 8700-RC-0006A, Rev. 12, "Ground FL. Slab EL. 693'-6" SH.-1 Turbine BLDG"   |
| - 8700-RC-0006B, Rev. 8, "Ground FI Slab Sections & Details Turbine Building"   | - 8700-RC-0007B, Rev. 7, "Mezz FI Slab Sect's & Det's Turbine Bldg"          |
| - 8700-RM-0003C, Rev. 17, "Mach. Loc. Turbine Area LI Plan Basement Floor"      | - EM 71592, "Fire Rating of Block Walls"                                     |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                  |  |

### **Open Items and VFDRs**

<b>VFDR Number</b>	BV1-3036	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

#### **Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-TO-1**

**Compliance Statement:**   Complies  
                                      Complies with Clarification  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire doors:

Door T93-2 is a 3 hour fire door and is periodically inspected by procedure.

Complies with use of EEEE

Fire dampers:

An analysis has been performed for non-UL rated dampers 1VS-D-272 and 1VS-D-273 and concludes that the existing configuration for VS-D-273 is acceptable due to fire loading, physical design and location, existence of suppression and dike to contain possible turbine oil spills.

Complies with Clarification:

These dampers are not in an inspection procedure.

Part of the fire barrier separation between compartments 1-TB-1 and 1-TO-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1. Adequacy of the separation between these compartments is documented in the Fire Risk Evaluation as well as the Generic Fire Risk Evaluation of the associated compartments (8700-01.062-0069 & 8700-01.0620-0080) and in the multi-compartment analysis report (8700-01.062-0013).

**Licensing Actions**

- None

**Supporting EEEEs**

FPPCE 13-030 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"  
- 1OM-54.3.TURBINE1, Rev. 36, "Turbine Log Readings"  
- 84-09-27, "Fire Damper Inspection Report ND1TPP:0219"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"  
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"  
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"  
- 8700-RA-0001E, Sht. 2, Rev. 15, "Floor Plan- Auxiliary Bay & Service BLDG"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- |   |   |
|---|---|
| - 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"                 | - 8700-RB-0002L, Rev. 7, "Fire Protection Arrangement"                            |
| - 8700-RB-0013A, Sht. 1, Rev. 8, "Ventilation Turbine Area & Auxiliary Bay" | - 8700-RB-0013B, Sht. 2, Rev. 8, "Ventilation Turbine Area & Auxiliary Bay"       |
| - 8700-RC-0002B, Rev. 12, "Foundation Mat-Outline Turbine BLDG"             | - 8700-RC-0006A, Rev. 12, "Ground FL. Slab EL. 693'-6" SH.-1 Turbine BLDG"        |
| - 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations"      | - 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)" |
| - 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers"   | - EM 71592, "Fire Rating of Block Walls"  |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"              |   |

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-3036	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-TO-1**

**Compliance Statement:** Complies with Clarification  
Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with Clarification:

The non fire-rated separations (fwall, ceiling, and ventilation openings) between compartments 1-TO-1 and 1-TB-1 uses a performance-based approach in accordance with NFPA 805 section 3.11.1.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

Item Number	Item Title
BV1-0714	Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-VP-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 3 hour fire rating. Barriers for this fire compartment range from 12 to 18 inches of concrete.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire barriers required for separation into the periodic inspection procedures, per Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-RC-0005G, Rev. 3, "Valve Pit and C.B. #20A"

**Open Items and VFDRs**

<b>Item Number</b>		<b>Item Title:</b>
BV1-3041		Addition of Barriers to Surveillance Procedures



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-VP-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

The only access to this fire compartment is a non-fire rated steel hatch accessible from the roadway, however this fire compartment is not subject to Chapter 4 because it is not a safety-related fire compartment containing redundant safe shutdown equipment and therefore is not required to have fire doors with specific fire resistance ratings.

Fire Dampers:

This fire compartment has no ventilation, and therefore no fire dampers are required.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire dampers and doors required for separation into the periodic inspection procedures, per Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 8700-RC-0005G, Rev. 3, "Valve Pit and C.B. #20A"

**Open Items and VFDRs**

Item Number	Item Title
BV1-3041	Addition of Barriers to Surveillance Procedures

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-VP-1

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Perimeter fire barriers in 1-VP-1 have no penetrations that could credibly lead to the spread of fire to an adjacent fire compartment.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire penetrations required for separation into the periodic inspection procedures, per Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 8700-RC-0005G, Rev. 3, "Valve Pit and C.B. #20A"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-3041	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-VP-2**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

The fire barrier overall rating for the existing concrete construction of the walls, ceilings, and floor shown on plant drawings represent a 3 hour fire rating. Barriers for this fire compartment range from 12 to 18 inches of concrete.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire barriers required for separation into the periodic inspection procedures, per Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- 8700-RC-0005G, Rev. 3, "Valve Pit and C.B. #20A"

**Open Items and VFDRs**

Item Number		Item Title
BV1-3041		Addition of Barriers to Surveillance Procedures

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 1-VP-2

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire Doors:

The only access to this fire compartment is a non-fire rated steel hatch accessible from the roadway, however this fire compartment is not subject to Chapter 4 because it is not a safety-related fire compartment containing redundant safe shutdown equipment and therefore is not required to have fire doors with specific fire resistance ratings.

Fire Dampers:

This fire compartment has no ventilation, and therefore no fire dampers are required.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire dampers and doors required for separation into the periodic inspection procedures, per Attachment S.

##### Licensing Actions

- None

##### Supporting EEEs

- None

##### References

- 8700-RC-0005G, Rev. 3, "Valve Pit and C.B. #20A"

##### Open Items and VFDRs

Item Number	Item Title
BV1-3041	Addition of Barriers to Surveillance Procedures

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-VP-2**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Perimeter fire barriers in 1-VP-2 have no penetrations that could credibly lead to the spread of fire to an adjacent fire compartment.

Will Comply with the Use of Commitment

An open item has been created to incorporate the inspection of the fire penetrations required for separation into the periodic inspection procedures, per Attachment S.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 8700-RC-0005G, Rev. 3, "Valve Pit and C.B. #20A"

**Open Items and VFDRs**

Item Number	Item Title:
BV1-3041	Addition of Barriers to Surveillance Procedures

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-WH-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Barriers with adjacent fire compartments have a minimum of 12 inches of concrete block. Exterior walls with no adjacent compartments are constructed using metal siding.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 11700-RA-0045E, Rev. 8, "Warehouse Extension - Elevations, Sections, & Details"
- 8700-RA-0001E, Sht. 2, Rev. 15, "Floor Plan- Auxiliary Bay & Service BLDG"
- 8700-RC-0006J, Rev. 6, "Warehouse Addition Foundation"
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735-6 Outline Service Bldg."

- 11700-RA-0045A, Rev. 9, "Warehouse Floor & Roof Plans"
- 8700-DSS-0100, Rev. 1, "Procurement Specification for Replacement of BV-1 Permanent Plant Roofing System"
- 8700-RA-0045A, Rev. 9, "Warehouse Floor & Roof Plans"
- 8700-RC-0006L, Rev. 3, "Warehouse Addition Foundation"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 1-WH-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors

Drawings and door schedules identify doors as 3-hour rated and adequate for the hazard.

Fire doors were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

**Licensing Actions**

- None

**Supporting EEEs**

FPPCE 13-030 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 8700-RB-0013C, Rev. 7, "Ventilation & Air Conditioning Auxiliary Bay"
- 8700-RB-0017D, Rev. 14, "Vent. & Air Cond. El. 735'-6" Sh. 4"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10ST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 8700-RB-0017C, Rev. 12, "Vent. & Air Cond El. 735'-6" Sh. 3 Service Building"
- 8700-RB-0017M, Rev. 5, "Ventilation & Air Conditioning for Service Bldgs El. 735'-6"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-3043	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 1-WH-1

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Will Comply with the Use of Commitment:

The penetration seal database is being finalized and fire barriers with adjacent compartments will be added to inspection procedures per Attachment S.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"
- 8700-10.001-1099, Rev. C, "Penetration Seal Tables for Service Building EL. 735'-6"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"
- 8700-10.001-0710, Rev. C, "Turbine Bldg. Auxiliary Bay 3 HR. Rated Walls & Floors"
- 8700-10.001-1120, Rev. C, "Fire Area CS-1, Access to Ceiling Penetrations"

**Open Items and VFDRs**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-3043	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-AIS-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

This fire compartment 3-AIS-1 consists of the Alternate Intake Structure and is physically separated from the rest of the plant by a large outdoor distance. The superstructure is a steel-framed structure with insulated steel siding. This structure contains equipment for BVPS-1 (WR-P-9A, B auxiliary river water pumps) and for BVPS-2 (2SWE-P21A, B standby service water pumps). The alternate intake structure and equipment is provided in the event of the complete loss of the intake structure and is, therefore, not normally required for shutdown.

This fire compartment is a single fire area with no adjacent fire area requiring separation by rated fire barriers.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-AIS-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

This fire compartment 3-AIS-1 consists of the Alternate Intake Structure and is physically separated from the rest of the plant by a large outdoor distance. The superstructure is a steel-framed structure with insulated steel siding. This structure contains equipment for BVPS-1 (WR-P-9A, B auxiliary river water pumps) and for BVPS-2 (2SWE-P21A, B standby service water pumps). The alternate intake structure and equipment is provided in the event of the complete loss of the intake structure and is, therefore, not normally required for shutdown.

This fire compartment is a single fire area with no adjacent fire area requiring separation by rated fire barriers.

There are no required fire doors or fire dampers separating this fire compartment from adjacent fire compartments.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-AIS-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Fire compartment 3-AIS-3, the Unit 1 Alternate Intake Structure, is physically separated from the rest of the plant by a large outdoor distance and does not have any boundaries surrounding the fire compartment. Therefore, there are no penetrations to be reviewed.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 3-CR-1

**Compliance Statement:** Complies  
Complies with Clarification

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

##### Compliance Basis:

Complies

A fire rated barrier exists for the control room benchboard access panels communicating with 1-CS-1.

Fire barriers surrounding this compartment are of reinforced concrete, a minimum of 8" thick, providing in excess of 3 hour fire resistance rating.

The fire barriers for this area are periodically inspected by procedure.

Complies with Clarification

The fire loading for the control room area is less than 1/2 hour. The existing walls, ceiling slabs, and floors exceed this required rating.

The PRA models both control rooms in a single fire compartment and addresses the main control room as part of the multi-compartment analysis. The absence of a wall separating the BV1 and BV2 main control rooms has been evaluated using a performance-based approach in accordance with NFPA 805 section 3.11.1 and NFPA 805 Section 4.2.4 risk informed methods and has shown no significant value to add a wall separating the unit control rooms to provide additional separation of safe shutdown trains for achieving the performance goals of NFPA 805 Section 1.5.

##### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"  
- 2701.620-000-020, Rev. A, "Detailed Fire Modeling Report - 2-CR-1"  
- 85-01-14, "Appendix R - Additional Exemption Requests"  
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"

##### Supporting FEEEs

- None

- 10080-DMC-0054, Rev. 2, Add. 1, "Analysis of Untested Seal Designs"  
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- 2701.620-000-053, Rev. A, "Fire Risk Evaluation of Control Room (3-CR-1)"  
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"  
- 8700-01.062-0034, Rev. A, "Detailed Fire Modeling Report - Fire Compartment 3-CR-1"

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

### **References**

- |  |  |
|--|--|
| - 8700-01.062-0059, Rev. A, "Fire Risk Evaluation of Control Room (3-CR-1)"                      | - 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"                                  |
| - 8700-10.001-0722 , Rev. E, "Cable Tunnel EL. 720'-0" Data Sheet"                               | - 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"   |
| - 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"           | - 8700-B-084, Rev. 12, Add. 2, "Fire Hazards Analysis"   |
| - 8700-DMC-2975, Rev. 0, Add. 2, "BV1 ESGR Area Heatup Following Recovery of Loss of All HVAC"   | - 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"  |
| - 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"  | - 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"   |
| - 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"  | - 8700-RB-0017J, Sht. 9, Rev. 16, "Air Conditioning- Plan- Control Room- Service Bldg."                        |
| - 8700-RB-0017K, Sht. 10, Rev. 15, "Air Conditioning- Sections- Control Room- Service BLDG."     | - 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735'-6 Outline Service Bldg."                                      |
| - 8700-RC-0008H, Rev. 11, "Sections, Service Building"   | - 8700-RC-0008R, Rev. 9, "Plan-EL. 735'-6" & Roof EL. 751'-8" Control Room Extension"                          |
| - CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco" | - CR 06-00570, "Evaluate Shakespaces for Removal From 1BVT1.33.5"  |
| - CR 06-09051, "NFPA 805-Control Room Fire Protection Compliance with BTP CMEB 9.5.1"            | - FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"  |
| - TER 10864, Rev. 0, "Evaluation of Six Penetration Seals in the Control Room Floor"             | - TER 11561, Rev. 0, "Penetr. CR-735-259 Internal Conduit Seal Alternate Seal Arrgmt. and Temp. Seal Approval" |
| - UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"                                   |  |

### **Open Items and VFDRs**

<b>VFDR Number</b>	BV1-0956	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

#### **Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-2719	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-CR-1**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

The PRA models both control rooms in a single fire compartment and addresses the main control room as part of the multi-compartment analysis.

Complies

**Fire Doors:**

The fire rated doors are periodically inspected by procedure.

Door O35-2 between 3-CR-1 and the vestibule of the turbine building is a 3 hour fire rated door.

Door S35-5 between 3-CR-1 and the control room stairwell is a 1.5 hour rated fire door.

Door S35-71 between the Unit 2 Control Room and the outside is not a fire rated door.

All other doors internal to the Unit 1 section of 3-CR-1 are non-rated.

Complies by Prior Approval

Door O35-2 was identified as having a security modification as well as an unlabeled pressed metal frame. NRC letter dated December 4, 1986 granted exemptions based the fire severity rated calculated for the area.

Complies by Clarification

**Fire Dampers:**

Drawings identify the ventilation for the Unit 1 portion of the control room. The drawings identify that the ventilation shaft between 1-CR-2 and 3-CR-1 does not have a fire damper in it.

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

### Fire Protection Features Transition Report

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

The absence of a fire damper separating the BV1 and BV2 main control rooms and 3-CR-1 with 1-CR-2 compartments has been evaluated using NFPA 805 Section 4.2.4 risk informed methods and has shown no significant value to add a fire damper separating the unit control rooms to provide additional separation of safe shutdown trains for achieving the performance goals of NFPA 805 Section 1.5. Fire detection in compartment 1-CR-2 is a transitioning requirement because of the absence of a fire rated damper.

#### **Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"
- 8700-10.001-0762, Rev. D, "Cable Mezzanine Data Sheet"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0001D, Sht. 1, Rev. 17, "Floor Plan Service Building"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0002M, Rev. 13, "Fire Protection Arrangement"
- 8700-RB-0017K, Sht. 10, Rev. 15, "Air Conditioning- Sections- Control Room- Service BLDG."
- 8700-RC-0008H, Rev. 11, "Sections, Service Building"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- CR 06-09051, "NFPA 805-Control Room Fire Protection Compliance with BTP CMEB 9.5.1"
- TER 10864, Rev. 0, "Evaluation of Six Penetration Seals in the Control Room Floor"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

#### **Supporting EEEs**

- None
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-DMC-0054, Rev. 2, Add. 1, "Analysis of Untested Seal Designs"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-10.001-0722, Rev. E, "Cable Tunnel EL. 720'-0" Data Sheet"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0006A, Sht. 1, Rev. 28, "Door Schedule - Sheet 1"
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"
- 8700-RB-0017J, Sht. 9, Rev. 16, "Air Conditioning- Plan- Control Room- Service Bldg."
- 8700-RC-0008C, Rev. 13, "Slab Plan at el. 735'-6 Outline Service Bldg."
- 8700-RC-0008R, Rev. 9, "Plan-EL. 735'-6" & Roof EL. 751'-8" Control Room Extension"
- CR 06-00570, "Evaluate Shakespaces for Removal From 1BVT1.33.5"
- FPSSR, Add. 30, "Fire Protection Safe Shutdown Report"
- TER 11561, Rev. 0, "Penetr. CR-735-259 Internal Conduit Seal Alternate Seal Arrgmt. and Temp. Seal Approval"

#### **Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**VFDR Number**      BV1-2719      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

**VFDR Number**      BV1-0956      Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 3-CR-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

10080-DMC-0054, Eval#IV-3 R2 A4  
FPPCE 11-024 Rev.0  
FPPCE 11-025 Rev.1  
FPPCE 13-009 Rev.0  
TER 009081 R0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"  
- 8700-10.001-0669, Rev. M, "Control Room EL. 735'-6" 3 HR. Fire Rated Floor and Walls"  
- 8700-10.001-0761, Rev. L, "Cable Mezzanine Floor and Wall Penetrations and Data Sheet"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"  
- 8700-10.001-0668, Rev. H, "Control Room EL. 735'-6" 3 HR Fire Rated Floor and Walls"  
- 8700-10.001-0721, Rev. D, "Cable Tunnel EL. 720'-0" 3 HR. Fire Rated Walls"

##### Open Items and VFDRs

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>Item Number</b>	BV1-0714	<b>Item Title:</b> Complete Penetration Seal Database
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

This fire detection is credited in compartment 3-IS-1 because it is included as part of the licensing exemption for no suppression over the deisel driven fire pump in compartment 3-IS-4 and is not credited to satisfy the nuclear safety criteria of Chapter 4 of NFPA-805. This fire area has ionization fire detectors. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

1. Cubicle 3-IS-1 is provided with eight ionization smoke detectors.
2. A walk down was performed to verify there are no significant platforms.
3. A walk down was performed to verify spacing is acceptable.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

- BV2-30 Intake Structure - Detection and Three-Hour Barriers versus Sprinklers

**Supporting EEEs**

FPPCE 13-011 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RE-0001AK, Rev. 22, "120v AC One line Diagram"
- 8700-RE-0011D, Rev. 30, "Wiring Diagram 120v Emergency Dist. Pnl. AC-E1 thru E6"
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-0064W, Sht. 10, Rev. 6, "W/D FIRE ALARM AND SECURITY ALARM SYSTEM"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16C, Rev. 1, "Early Warning Smoke Det Instr Test Main Intake Structure"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0064C, Sht. 2, Rev. 13, "PLAN FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The barriers that comprise the perimeter of these fire areas consist of reinforced concrete walls and slabs with a minimum thickness of 18 inches. All door openings leading into, or between, cubicles have 3-hr fire rated doors. Two slots exists in the ceiling for ventilation. These slots are discussed in the 3.11.3 record.

The fire barriers are periodically inspected by procedure.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

- 85-01-14, "Appendix R - Additional Exemption Requests"

- 8700-10.001-0687, Rev. H, "Intake Structure Cubicle No. 1 3 HR. Fire Floor & Wall"

- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"

- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"

- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"

- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."

- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"

- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"

- TER 10840, "Intake Structure Pump Cubicles Exhaust Vents"

- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"

- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"

- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"

- 8700-B-084, Rev. 12, "Fire Hazards Analysis"

- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"

- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"

- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"

- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"

- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"

- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-1**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

Complies by Previous Approval

Both fire doors a 3 hour fire rated.

The fire door are inspected by procedure.

Doors IS05-12 and IS05-13 were identified as having security modifications and both doors are identified as having a pipe penetrating through an upper corner of the door frame. NRC letter dated December 4, 1986 granted exemptions based upon the January 14, 1985 submittal. In pertaining to fire doors in the intake structure, the letter acknowledges that a UL representative visited the plant and inspected typical examples of each type of deviation identified in the January 14 letter. The subject letter of December 4, 1986 also acknowledges and states the following: On the basis of the UL evaluation, the licensee made corrective modifications to several door assemblies except for the doors in the intake structure. UL recommended that the interior of all pipes and conduits penetrating fire door frames should be filled with a fire stop material. The pipes through the intake structure door frames convey pressurized air used to activate sliding flood doors located behind the fire door at each opening. The exterior of the pipe penetration has been made tight fitting, but the pipes cannot be sealed internally without interrupting the air supply. In case of fire in one of Fire Areas 3-IS-1 through 3-IS-4, safe shutdown capability would not be affected because redundant systems are available in other fire areas. In addition, the solid wall between Fire Areas 3-IS-2 and 3-IS-3 would prevent a fire in Fire Areas 3-IS-1 or 3-IS-2 from spreading to Fire Areas 3-IS-3 or 3-IS-4. Therefore, the staff concluded that based on the evaluation the fire door assemblies, combined with the licensee's modifications, provided an acceptable level of protection in accordance with the guidelines of Section D.1 (j) of Appendix A to BTP APCSB 9.5-1.

Complies by Clarification

Fire Dampers:

There are no ventilation penetrations between cubicles. There are two openings in the ceiling for ventilation. One opening is to the outside. The other opening is to 3-IS-6. The ventilation opening between compartments 3-IS-1 & 3-IS-6 uses a performance-based approach in accordance with NFPA 805 section 3.11.3. Adequacy of the separation between these compartments is documented in the Generic Fire Risk Evaluation which includes the associated compartments MCA report

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-10.001-0687, Rev. H, "Intake Structure Cubicle No. 1 3 HR. Fire Floor & Wall"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"
- TER 10840, "Intake Structure Pump Cubicles Exhaust Vents"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-2656	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 3-IS-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

##### Licensing Actions

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

##### Supporting EEEEs

FPPCE 13-011 Rev.0

##### References

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0687, Rev. H, "Intake Structure Cubicle No. 1 3 HR. Fire Floor & Wall"

##### Open Items and VFDRs

###### Item Number

BV1-0714

**Item Title:** Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

This fire detection is credited in compartment 3-IS-2 because it is included as part of the licensing exemption for no suppression over the deisel driven fire pump in compartment 3-IS-4 and is not credited to satisfy the nuclear safety criteria of Chapter 4 of NFPA-805. This fire area has ionization fire detectors. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

1. Cubicle 3-IS-1 is provided with eight ionization smoke detectors.
2. A walk down was performed to verify there are no significant platforms.
3. A walk down was performed to verify spacing is acceptable.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

- BV2-30 Intake Structure - Detection and Three-Hour Barriers versus Sprinklers

**Supporting EEEs**

FPPCE 13-011 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RE-0001AK, Rev. 22, "120v AC One line Diagram"
- 8700-RE-0011D, Rev. 30, "Wiring Diagram 120v Emergency Dist. Pnl. AC-E1 thru E6"
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-0064W, Sht. 10, Rev. 6, "W/D FIRE ALARM AND SECURITY ALARM SYSTEM"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16C, Rev. 1, "Early Warning Smoke Det Instr Test Main Intake Structure"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0064C, Sht. 2, Rev. 13, "PLAN FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The barriers that comprise the perimeter of these fire areas consist of reinforced concrete walls and slabs with a minimum thickness of 18 inches. All door openings leading into, or between, cubicles have 3-hr fire rated doors. Two slots exist in the ceiling for ventilation. One goes to the outside and the other to 3-IS-6. These are discussed in the 3.11.3 record.

The fire barriers are periodically inspected by procedure.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1BVT 1.33.5, Rev. 7, "Fire-Rated Assemblies Visual Inspection"  
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"  
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"  
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"  
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"  
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."  
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"  
- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"  
- TER 10840, "Intake Structure Pump Cubicles Exhaust Vents"

- 85-01-14, "Appendix R - Additional Exemption Requests"  
- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"  
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"  
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"  
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"  
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at EL. 730'-0" & Misc. Details"  
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"  
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"  
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-2**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

Complies

The fire doors are both 3 hour rated.

Fire doors are periodically inspected by procedure.

Complies by Previous Approval

Doors IS05-10 and IS05-12 were identified as having security modifications and both doors are identified as having a pipe penetrating through an upper corner of the door frame. NRC letter dated December 4, 1986 granted exemptions based upon the January 14, 1985 submittal. In pertaining to fire doors in the intake structure, the letter acknowledges that a UL representative visited the plant and inspected typical examples of each type of deviation identified in the January 14 letter. The subject letter of December 4, 1986 also acknowledges and states the following: On the basis of the UL evaluation, the licensee made corrective modifications to several door assemblies except for the doors in the intake structure. UL recommended that the interior of all pipes and conduits penetrating fire door frames should be filled with a fire stop material. The pipes through the intake structure door frames convey pressurized air used to activate sliding flood doors located behind the fire door at each opening. The exterior of the pipe penetration has been made tight fitting, but the pipes cannot be sealed internally without interrupting the air supply. In case of fire in one of Fire Areas 3-IS-1 through 3-IS-4, safe shutdown capability would not be affected because redundant systems are available in other fire areas. In addition, the solid wall between Fire Areas 3-IS-2 and 3-IS-3 would prevent a fire in Fire Areas 3-IS-1 or 3-IS-2 from spreading to Fire Areas 3-IS-3 or 3-IS-4. Therefore, the staff concluded that based on the evaluation the fire door assemblies, combined with the licensee's modifications, provided an acceptable level of protection in accordance with the guidelines of Section D.1 (j) of Appendix A to BTP APCSB 9.5-1.

Complies with Clarification

Fire Dampers:

There are no ventilation penetrations between cubicles. There are two ventilation openings in the ceiling. One goes to the outside and the other into compartment 3-IS-6.

The ventilation opening between compartments 3-IS-2 & 3-IS-6 uses a performance-based approach in accordance with NFPA 805 section 3.11.3. Adequacy of the WebTRAN v13.16c



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

### Fire Protection Features Transition Report

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

separation between these compartments is documented in the Generic Fire Risk Evaluation which includes the associated compartments MCA report

#### **Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

#### **Supporting EEEEs**

- None

#### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"
- TER 10840, "Intake Structure Pump Cubicles Exhaust Vents"

#### **Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**VFDR Number**            BV1-2656            Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**  
Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-2**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

FPPCE 13-011 Rev.0

**References**

- 1OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0668, Rev. H, "Control Room El. 735'-6" 3 HR Fire Rated Floor and Walls"

**Open Items and VFDRs**

Item Number	Item Title:
BV1-0714	Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-IS-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

This fire detection is credited in compartment 3-IS-3 because it is included as part of the licensing exemption for no suppression over the diesel driven fire pump in compartment 3-IS-4 and is not credited to satisfy the nuclear safety criteria of Chapter 4 of NFPA-805. This fire area has ionization fire detectors. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

1. Cubicle 3-IS-3 is provided with eight ionization smoke detectors.
2. A walk down was performed to verify there are no significant platforms.
3. A walk down was performed to verify spacing is acceptable.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

- BV2-30 Intake Structure - Detection and Three-Hour Barriers versus Sprinklers

**Supporting EEEEs**

FPPCE 13-011 Rev.0

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RE-0001AK, Rev. 22, "120v AC One line Diagram"
- 8700-RE-0011D, Rev. 30, "Wiring Diagram 120v Emergency Dist. Pnl. AC-E1 thru E6"
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064JR, Rev. 2, "Cable Block Diagram Fire Detection DGP-2A, DGP-2B"
- 8700-RE-0064W, Sht. 10, Rev. 6, "W/D FIRE ALARM AND SECURITY ALARM SYSTEM"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16C, Rev. 1, "Early Warning Smoke Det Instr Test Main Intake Structure"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0064C, Sht. 2, Rev. 13, "PLAN FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- NFPA-72E, Rev. 1978, "NFPA-72E, Automatic Fire Detectors 1978"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The barriers that comprise the perimeter of these fire areas consist of reinforced concrete walls and slabs with a minimum thickness of 18 inches. All door openings leading into, or between, cubicles have 3-hr fire rated doors. Two slots exist in the ceiling for ventilation. These will be discussed in the 3.11.3 record.

The fire barriers are periodically inspected by procedure.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEs**

- None

**References**

- 1BVT 1.33.5, Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0689, Rev. J, "Intake Structure Cubicle No. 3 3 HR Fire Floor and Walls"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"
- TER 10840, "Intake Structure Pump Cubicles Exhaust Vents"

**Open Items and VFDRs**

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-3**

**Compliance Statement:**   Complies by Previous Approval  
                                      Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

Both fire doors are 3 hour rated.

Fire doors are periodically inspected by procedure.

Complies by Previous Approval

Doors IS05-7 and IS05-5 were identified as having security modifications and both doors are identified as having a pipe penetrating through an upper corner of the door frame. NRC letter dated December 4, 1986 granted exemptions based upon the January 14, 1985 submittal. In pertaining to fire doors in the intake structure, the letter acknowledges that a UL representative visited the plant and inspected typical examples of each type of deviation identified in the January 14 letter. The subject letter of December 4, 1986 also acknowledges and states the following: On the basis of the UL evaluation, the licensee made corrective modifications to several door assemblies except for the doors in the intake structure. UL recommended that the interior of all pipes and conduits penetrating fire door frames should be filled with a fire stop material. The pipes through the intake structure door frames convey pressurized air used to activate sliding flood doors located behind the fire door at each opening. The exterior of the pipe penetration has been made tight fitting, but the pipes cannot be sealed internally without interrupting the air supply. In case of fire in one of Fire Areas 3-IS-1 through 3-IS-4, safe shutdown capability would not be affected because redundant systems are available in other fire areas. In addition, the solid wall between Fire Areas 3-IS-2 and 3-IS-3 would prevent a fire in Fire Areas 3-IS-1 or 3-IS-2 from spreading to Fire Areas 3-IS-3 or 3-IS-4. Therefore, the staff concluded that based on the evaluation the fire door assemblies, combined with the licensee's modifications, provided an acceptable level of protection in accordance with the guidelines of Section D.1 (j) of Appendix A to BTP APCSB 9.5-1.

Complies with Clarification

Fire Dampers:

There are no ventilation penetrations between cubicles. There are ventilations in the ceiling. One goes to the outside and the other into compartment 3-IS-6.

The ventilation opening between compartments 3-IS-3 & 3-IS-6 uses a performance-based approach in accordance with NFPA 805 section 3.11.3. Adequacy of the

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11/18/2013

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

separation between these compartments is documented in the Generic Fire Risk Evaluation which includes the associated compartments MCA report

### **Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

### **Supporting EEEEs**

- None

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- 8700-RM-0063E, Rev. S, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"
- TER 10840, "Intake Structure Pump Cubicles Exhaust Vents"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-10.001-0689, Rev. J, "Intake Structure Cubicle No. 3 3 HR Fire Floor and Walls"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at EL. 730'-0" & Misc. Details"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

### **Open Items and VFDRs**



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-2656	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-3**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

FPPCE 13-011 Rev.0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"

**Open Items and VFDRs**

Item Number	Item Title
BV1-0714	Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-IS-4

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

This fire area has heat actuated fire detectors. The following critical attributes of the detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1973.

1. Cubicle 3-IS-4 is provided with two heat detectors.
2. A walk down was performed to verify there are no significant platforms.
3. A walk down was performed to verify spacing is acceptable.
4. Confirmed the fire detectors are periodically tested by procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detector(s) or a trouble alarm, or upon a fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local control panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

- BV2-30 Intake Structure - Detection and Three-Hour Barriers versus Sprinklers

**Supporting EEEs**

- None

**References**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RE-0001AK, Rev. 22, "120v AC One line Diagram"
- 8700-RE-0011D, Rev. 30, "Wiring Diagram 120v Emergency Dist. Pnl. AC-E1 thru E6"
- 8700-RE-0064CA, Rev. 3, "W/D-Fire Detection System, Misc Details"
- 8700-RE-0064G, Sht. 3, Rev. 9, "W/D Fire Alarm and Security Alarm System SH. 3"
- 8700-RE-0064N, Sht. 8, Rev. 5, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"
- 10ST-33.16C, Rev. 1, "Early Warning Smoke Det Instr Test Main Intake Structure"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at EL. 730'-0" & Misc. Details"
- 8700-RE-0001K, Rev. 28, "480 V One Line Diagram"
- 8700-RE-0064C, Sht. 2, Rev. 13, "PLAN FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064E, Sht. 1, Rev. 13, "W/D FIRE ALARM & SECURITY ALARM SYSTEM"
- 8700-RE-0064JP, Rev. 2, "Cable Block Diagram - Fire Detection DGP-1A, DGP-1B, DGP-7"
- 8700-RE-0064W, Sht. 10, Rev. 6, "W/D FIRE ALARM AND SECURITY ALARM SYSTEM"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-4**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The barriers that comprise the perimeter of these fire areas consist of reinforced concrete walls and slabs with a minimum thickness of 18 inches. All door openings leading into, or between, cubicles have 3-hr fire rated doors. Two slots exists in the ceiling for ventilation. These will be discusses in the 3.11.3 record.

The fire barriers are periodically inspected by procedure

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-10.001-0690, Rev. H, "Intake Structure Cubicle No. 4 3 HR. Fire Floor & Wall"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-10.001-0689, Rev. J, "Intake Structure Cubicle No. 3 3 HR Fire Floor and Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"
- UFPAARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Open Items and VFDRs**

- None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 1

##### Fire Compartment - 3-IS-4

**Compliance Statement:**   Complies by Previous Approval  
                                      Complies with Clarification

##### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### **Compliance Basis:**

Complies by Previous Approval

Fire Doors:

Both doors are 3 hour rated.

Fire doors are periodically inspected by procedure.

Doors IS05-4 and IS05-5 were identified as having security modifications and both doors are identified as having a pipe penetrating through an upper corner of the door frame. NRC letter dated December 4, 1986 granted exemptions based upon the January 14, 1985 submittal. In pertaining to fire doors in the intake structure, the letter acknowledges that a UL representative visited the plant and inspected typical examples of each type of deviation identified in the January 14 letter. The subject letter of December 4, 1986 also acknowledges and states the following: On the basis of the UL evaluation, the licensee made corrective modifications to several door assemblies except for the doors in the intake structure. UL recommended that the interior of all pipes and conduits penetrating fire door frames should be filled with a fire stop material. The pipes through the intake structure door frames convey pressurized air used to activate sliding flood doors located behind the fire door at each opening. The exterior of the pipe penetration has been made tight fitting, but the pipes cannot be sealed internally without interrupting the air supply. In case of fire in one of Fire Areas 3-IS-1 through 3-IS-4, safe shutdown capability would not be affected because redundant systems are available in other fire areas. In addition, the solid wall between Fire Areas 3-IS-2 and 3-IS-3 would prevent a fire in Fire Areas 3-IS-1 or 3-IS-2 from spreading to Fire Areas 3-IS-3 or 3-IS-4. Therefore, the staff concluded that based on the evaluation the fire door assemblies, combined with the licensee's modifications, provided an acceptable level of protection in accordance with the guidelines of Section D.1 (j) of Appendix A to BTP APCSB 9.5-1.

Complies with Clarification

Fire Dampers:

There are no ventilation penetrations between cubicles. There are ventilations in the ceiling. One goes to the outside and the other into compartment 3-IS-6.

The ventilation opening between compartments 3-IS-4 & 3-IS-6 uses a performance-based approach in accordance with NFPA 805 section 3.11.3. Adequacy of the separation between these compartments is documented in the Generic Fire Risk Evaluation which includes the associated compartments MCA report

#### Licensing Actions

#### Supporting EEEEs

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1BVT 1.33.5, Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-10.001-0689, Rev. J, "Intake Structure Cubicle No. 3 3 HR Fire Floor and Walls"
- 8700-10.001-0816, Rev. B, "ANI Acceptance of Testing For Promatec Fire Seal Designs"
- 8700-DMC-2912, Rev. 0, "Evaluation of Internal Conduit Seals"
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Supporting EEEEs**

- None

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 1OST-33.5, Rev. 19, "Fire Protection System Inspection Test"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-10.001-0690, Rev. H, "Intake Structure Cubicle No. 4 3 HR. Fire Floor & Wall"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"
- CR 01-2628, "Original Penetration Seal Documentation Not Formally Incorporated Into BVRC Reco"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

<b>VFDR Number</b>	BV1-2656	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-4**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 8700-10.001-0690, Rev. H, "Intake Structure Cubicle No. 4 3 HR. Fire Floor & Wall"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0689, Rev. J, "Intake Structure Cubicle No. 3 3 HR Fire Floor and Walls"

**Open Items and VFDRs**

Item Number	Item Title
BV1-0714	Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-6**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

3-IS-6 consists of all areas of the Intake Structure except 3-IS-1 thru -4. Adjacent compartments to IS-6 are as follows: Above – Atmosphere, North, East and West – none, South – 3-Yard-1, Below – Below grade and river, and enclosed within IS-6 is 3-IS-1 thru -4. 3-IS-1 thru -4 are defined as their own fire compartments.

Complies

The Intake Structure walls are constructed of reinforced concrete (up to El. 705' and up to El. 730' around the Intake Structure cubicles) and of insulated metal siding beginning at El. 705' and ending at El. 759'10"). The roof is constructed of metal decking over steel supports. The Intake Structure is located in an outdoor area that is spatially separated from the from the other fire compartments with the exception of the Intake Cubicles 3-IS-1 thru -4. Each cubicle is provided with a minimum 18 inch thick concrete enclosures with qualified fire doors.

A slot exists in the ceiling of each Intake Cubicles into 3-IS-6 for the ventilation. The opening is discussed in the 3.11.3 record.

The fire barriers are periodically inspected by procedure.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 1PFP-INTS-705-Pump Cubicles, Rev. 1, "Fire Areas IS-1, 2, 3, 4"
- 8700-01.062-0013, Rev. B, "NFPA 805 Fire PRA Task 5.11C Multi Compartment Fire Analysis"
- 8700-B-084, Rev. 12, "Fire Hazards Analysis"
- 8700-RC-0032F, Rev. 15, "Intake Structure- Sheet 3 Plan At EL. 705'-0" & Misc DETS."
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- UFPARR, Rev. 30, "Updated Fire Protection Appendix R Review"

**Supporting EEEEs**

- None

- 1BVT 1.33.5 , Rev. 7, "Fire-Rated Assemblies Visual Inspection"
- 1PFP-INTS-705-Screen Area, Rev. 1, "Fire Area IS"
- 8700-01.062-0080, Rev. A, "Fire Risk Evaluation of Generic Fire Compartments"
- 8700-RA-0019A, Rev. 8, "Intake Structure Plans & Elevations"
- 8700-RC-0032G, Sht. 4, Rev. 12, "Intake Structure Plan at El. 730'-0" & Misc. Details"
- 8700-RM-0059F, Sht. 2, Rev. 10, "Arrangement Intake Structure"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-6**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Doors:

Complies

The following fire doors: IS05-13 between IS-1 and IS-6, IS05-10 between IS-2 and IS-6, IS05-7 between IS-3 and IS-6, IS05-4 between IS-4 and IS-6 are 3-hour fire doors.

Fire doors are periodically inspected by procedure.

Complies by Previous Approval

NRC letter dated December 4, 1986 granted exemptions based upon the January 14, 1985 submittal. In pertaining to fire doors in the intake structure, the letter acknowledges that a UL representative visited the plant and inspected typical examples of each type of deviation identified in the January 14 letter. The subject letter of December 4, 1986 also acknowledges and states the following: On the basis of the UL evaluation, the licensee made corrective modifications to several door assemblies except for the doors in the intake structure. UL recommended that the interior of all pipes and conduits penetrating fire door frames should be filled with a fire stop material. The pipes through the intake structure door frames convey pressurized air used to activate sliding flood doors located behind the fire door at each opening. The exterior of the pipe penetration has been made tight fitting, but the pipes cannot be sealed internally without interrupting the air supply. In case of fire in one of Fire Areas IS-1 through IS-4, safe shutdown capability would not be affected because redundant systems are available in other fire areas. Therefore, the staff concluded that based on the evaluation the fire door assemblies, combined with the licensee's modifications, provided an acceptable level of protection in accordance with the guidelines of Section D.1 (j) of Appendix A to BTP APCS 9.5-1.

Complies with Clarification

Fire Dampers:

There are no ventilation penetrations between cubicles. The only opening for the ventilation system is from each cubicle into the main Intake Structure. The opening is a 12-in. wide and approximately 18 feet long slot in each ceiling to discharge air from the cubicles. Half of the opening is covered with a 7' high vent stack and the other half has a cover plate. These were installed to protect the cubicles flooding. This open ventilation penetration uses a performance-based approach in accordance with NFPA 805 section 3.11.3. Adequacy of the separation between these compartments is documented in the Generic Fire Risk Evaluation which includes the associated compartments MCA report.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 85-01-14, "Appendix R - Additional Exemption Requests"
- 8700-RA-0006B, Sht. 2, Rev. 21, "Door Schedule"
- 8700-RB-0026A, Rev. 10, "Building Services Intake SH-1"
- 8700-RM-0063E, Rev. 5, "Penetration Seals- Cooling Tower Pump Hse & Int. Structure"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)"
- 8700-RA-19A, Rev. 8, "Drawing"
- 8700-RM-0059E, Sht. 1, Rev. 13, "ARRGT Intake Structure"
- UFSAR, Rev. 27, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV1-2656	Some fire barriers between fire compartments are not fire-rated. Performance-based methods will be used to analyze these barriers.
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Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Vital Auxiliaries. This is a separation issue.

Component ID:  
NA

**Disposition**

Performance-based analysis has concluded the non-rated portion of the fire barriers is adequate to withstand the fire effects of the potential hazard. No further action required.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment - 3-IS-6**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE:

The penetration seal designs are based on 3 hour fire rated tested configurations and approved fire seal typical sections. Beaver Valley Unit 1 contains some penetrations between fire areas where exact duplication of a specific 3 hour fire rated tested configuration or approved fire seal typical section is not achieved. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with the Use of Commitment:

The penetration seal database is being finalized.

**Licensing Actions**

- 11.18 Fire Doors - Lack of 3-Hr Fire Barriers (III.G.2 criteria)

**Supporting EEEEs**

FPPCE 13-011 Rev.0

**References**

- 10ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 2701.620-000-046, Rev. A, "Evaluation of Aluminum Conduit Seal Penetration Fire Tests"

- 2701.620-000-007, Rev. A, "Conduit Fire Protection Research Program Final Report"

- 8700-10.001-0688, Rev. K, "Intake Structure Cubicle No. 2 3 HR Fire Floor and Wall"

**Open Items and VFDRs**

Item Number	Item Title
BV1-0714	Complete Penetration Seal Database

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-YARD-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

3-YARD-1 is common to both Unit 1 and Unit 2. See Unit 2 record for Compliance Basis.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-YARD-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** *Passive Protection*

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

3-YARD-1 is common to both Unit 1 and Unit 2. See Unit 2 record for Compliance Basis.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 1**

**Fire Compartment -** 3-YARD-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Fire Compartment (3-YARD-1) is comprised of underground electrical manholes, handholes, and associated electrical ductlines located in the site yard area.

Due to the manholes and ductlines being below grade and any penetration seals are being analyzed from the adjacent fire compartment (where applicable), fire seals and smoke and hot gas seals are not credited for 3-YARD-1.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

**Open Items and VFDRs**

-None

**Beaver Valley Power Station, Unit 2, Attachment A2 Records**

395 Pages Attached

## Transition Report Attachment

**Beaver Valley Unit 2**

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

Transition Report Section: - **Attachments**

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

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-ASP**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

Fire Compartment 2-ASP consists of the alternate shutdown panel room located on the 760'- 0" elevation. The compartment is provided with one ionization smoke detector identified as part of Zone 52 detectors that comprise the PAB/Rod control zone.

The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10.

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEEs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RE-0064C, Rev. 6, "CND PLN FD AUX BLDG 735 & 755"
- 10080-TLD-033D-052-02, Rev. 4, "FD ZONE 52"
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"
- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 10080-RC-0036E, Rev. 10, "PLAN AUX BLDG EL 773"
- 10080-TLD-033D-052-01, Rev. 4, "FD ZONE 52"
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- FPSSR, Add. 32, "BV2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

- None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment** - 2-ASP

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

#### **Compliance Basis:**

Separation of 2-ASP from adjacent fire areas is provided by 3-hour fire rated boundaries. The roof, walls, and floor of 2-ASP are 1-ft. thick concrete.

#### Licensing Actions

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### Supporting EEEs

- None

#### References

- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"  
- 10080-RC-0036D, Rev. 6, "PLAN 735 AUX BLDG"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"  
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

- 10080-RC-0036B, Rev. 10, "PLAN EL 735 & 755 AUX BLDG"  
- 10080-RC-0037S, Rev. 3, "WALL SECT AUX BLDG"  
- 87-05-05, "BV2 SSER "  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-ASP**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies via Previous Approval

Fire Dampers:

There are HVAC duct penetrations in the barrier between 2-ASP and adjacent fire compartments. All HVAC duct penetrations are protected by two 1 1/2-hour fire rated dampers in a series. A deviation for using two 1 1/2-hour fire dampers in lieu of one 3 hour fire damper is documented in NRC SERs 3 and 5 and is accepted by NRC.

Complies

Fire Doors:

Door A-55-9 separates 2-ASP from CV-3 and has a 3-hour fire rating. Fire doors and fire dampers were confirmed to be inspected periodically by administrative procedures and preventative maintenance tasks.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

- None

**References**

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"  
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"  
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"  
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment** - 2-ASP

**Compliance Statement:** Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

#### **Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

#### Licensing Actions

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### Supporting EEEEs

- None

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"

- 10080-DMC-0054, Rev. 2, Add. 3, "Analysis of Untested Seal Designs"

- 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"

- 10080-RM-0301E, Rev. 12, "Hazard Boundaries EL 774 - 7"

- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"

- B-240, Rev. 0, "Fire Seal Eval Untested Design"

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"

- 10080-RM-0301A, Rev. 6, "Hazard Boundaries"

- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EL 760 7"

- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"

- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

#### Open Items and VFDRs

-None



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

### Fire Protection Features Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

**Fire Compartment -** 2-CB-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

#### **Compliance Basis:**

Fire Compartment 2-CB-1 consists of the Instrument & Relay Rm. (CB-1), Cable Spreading Rm. (CB-2) and Cable tunnel (CT-1).

The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975.

Items 1 through 10.

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

#### Licensing Actions

#### Supporting EEEs

10080-DMC-0054 Rev.2 A4

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-TLD-033D-010-02, Rev. 6, "FD ZONE 10 CONTROL BLDG SD"
- 10080-TLD-033D-015-02, Rev. 4, "FD ZONE 15 CONTROL BLDG SD"
- 10080-TLD-033D-016-02, Rev. 4, "FD ZONE 16 CONTROL AB SD"
- 10080-TLD-033D-022-02, Rev. 4, "FD ZONE 22CONTRL AB SD"
- 10080-TLD-033D-023-02, Rev. 4, "FD ZONE 23 CONTROL RM SD"
- 10080-TLD-033D-036-02, Rev. 6, "FD ZONE 36 AB SD"
- 87-05-05, "BV2 SSER "
- 8700-RC-0008T, Rev. 10, "Control room Ext"
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"

**Supporting EEEEs**

- 10080-TLD-033D-010-01, Rev. 6, "FD ZONE 10 CONTROL BLDG"
- 10080-TLD-033D-015-01, Rev. 4, "FD ZONE 15 CONTROL BLDG SD"
- 10080-TLD-033D-016-01, Rev. 4, "FD ZONE 16 CONTROL AB SD"
- 10080-TLD-033D-022-01, Rev. 4, "FD ZONE 22 CONTRL AB SD"
- 10080-TLD-033D-023-01, Rev. 4, "FD ZONE 23 CONTROL RM"
- 10080-TLD-033D-036-01, Rev. 6, "FD ZONE 36 AB SD"
- 20ST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- 8700-RC-0008Q, Rev. 10, "Plan @ EL 707'-6" & 725'-6" Control Room Extension"
- 8700-RC-0008W, Rev. 7, "Elec. Cable Tunnel - Plan & Sects., Control Room Extension"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CB-1**

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

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The following critical attributes of the NFPA 12-1977 code were evaluated to ensure functionality and reliability:

1. A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
2. A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
3. The CO2 will discharge after a pre-discharge time delay during which alarm horns and revolving red lights warn any personnel in the area to evacuate.
4. Smoke detectors are available in the fire compartment and will actuate the CO2 system if alarmed. This area is equipped with local alarms and alarms in the main control room. See commitment below.
5. CO2 system is outfitted with a manual discharge station which is tested by procedure.
6. Fire dampers and area supply and exhaust fans close or trip to reduce the loss of CO2 concentration.
7. Level and Pressure alarms of the storage tanks are available in the control room.
8. Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9. A procedure tests the pre-discharge time on a periodic basis.
10. There are four fire dampers that will close upon actuation of the CO2.
11. Overpressurization is prevented by a pressure relief damper.
12. The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

13. A compensatory action plan is required to be established if the system becomes inoperable.

Complies by Previous Approval

10. All doors to this compartment are fire-rated doors and are normally closed. There are unsupervised fire doors in 2-CB-1, which is documented as an accepted deviation in the NUREG 1057 SER.

Will Comply with the Use of Commitment

4. A modification is required for the relocation of some fire detector actuation devices.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-LSK-20-2D, Rev. 10, "Logic Diagram - CO2 (Fire Protection) System"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-007-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-007-04, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-008-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Flow"
- 10080-TLD-033A-009-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-04, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-06, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 2010.190-174-006, Rev. G, "Low Pressure CO2 Zone 1 Cable Tunnel Aux Bldg"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 20M-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- 12241-B-226 R0 A0
- TER-012608 R0

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-TLD-033A-007-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-007-03, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-008-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Flow"
- 10080-TLD-033A-009-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-03, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-05, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-07, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 2710.180-174-036, Rev. A, "CALC CO2 SYSTEM 2 ZONE 1 CONTROL BUILDING TUNNEL"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 20M-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 20ST-33.13A, Rev. 11, "Smoke Detector Test"
- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"
- 20ST-33.13N, Rev. 0, "Cable Tunnel And Control Building (Zone 1) CO2 "Puff" Test"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

**Fire Compartment** - 2-CB-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

#### **Compliance Basis:**

A smoke detector alarm and CO2 discharge will alarm and annunciate in the Main Control Room.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### References

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-TLD-033A-007-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-007-04, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-008-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Flow"
- 10080-TLD-033A-009-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-04, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-06, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

#### Supporting EEEs

- None

- 10080-TLD-033A-007-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-007-03, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-008-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Flow"
- 10080-TLD-033A-009-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-03, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-05, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-07, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CB-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

Over-pressurization during CO2 injection is prevented by a pressure relief damper, the fire dampers close and ventilation fans trip on actuation of the CO2, and this area is not part of the radiologically controlled area and release of radioactive materials is not expected.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Supporting EEEEs**

- None

- 10080-RM-0433-002A , Rev. 15, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM "
- 2OST-33.13N, Rev. 0, "Cable Tunnel And Control Building (Zone 1) CO2 "Puff" Test"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CB-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEs**

- None

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

- None



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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment** - 2-CB-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

#### **Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone which can be used to prevent the discharge of CO2 when workers are in that zone. The key locked switch is under strict administrative control. Normal and abnormal conditions are monitored and annunciated (audiovisual) in the main control room.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### References

- 2OM-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

#### Supporting EEEEs

- None

- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

#### Open Items and VFDRs

-None

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

**Beaver Valley Unit 2**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Fire Compartment** - 2-CB-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

Access to the control building requires travel through doors equipped with card-readers. This fire compartment within the Control Building is not continuously occupied.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 20ST-33.13N, Rev. 0, "Cable Tunnel And Control Building (Zone 1) CO2 "Puff" Test"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Supporting EEEs**

- None

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

**Fire Compartment** - 2-CB-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

#### **Compliance Basis:**

The CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The CO2 system is equipped with an odorizer.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### References

- 10080-LSK-20-2D, Rev. 10, "Logic Diagram - CO2 (Fire Protection) System"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-007-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-007-04, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-008-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Flow"
- 10080-TLD-033A-009-02, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-04, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-06, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 20ST-33.13A, Rev. 11, "Smoke Detector Test"

#### Supporting EEEs

- None

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-TLD-033A-007-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-007-03, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Area Valve"
- 10080-TLD-033A-008-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Flow"
- 10080-TLD-033A-009-01, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-03, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-05, Rev. 4, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 10080-TLD-033A-009-07, Rev. 5, "TLD - Fire Protection CO2 System 2 Zone 1 Fire Detectors"
- 20ST-33.13N, Rev. 0, "Cable Tunnel And Control Building (Zone 1) CO2 "Puff" Test"

#### Open Items and VFDRs

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CB-1

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

- None

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

**Open Items and VFDRs**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**VFDR Number**      BV2-0406      CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - 2-CB-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.9 - Secondary thermal shock

#### Compliance Basis:

This compartment has both underfloor and above floor CO2 nozzles. While cable trays may be located near the nozzles, the electrical equipment is not. Adequate spacing between the CO2 nozzles and equipment provides reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components. Also, any such effects would be of minor concern compared to damage caused by an uncontrolled fire.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### References

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 20ST-33.13N, Rev. 0, "Cable Tunnel And Control Building (Zone 1) CO2 "Puff" Test"

#### Supporting EEEs

- None

- 10080-RB-0096A, Rev. 7, "CO2 FP System Control Bldg & Cable Tunnel"

- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"

#### Open Items and VFDRs

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CB-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. Any of these would be of very minor concern compared to the damage caused by an unmitigated fire along with its decomposition products.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

- None

**References**

- "Fire Protection Handbook, Twentieth Edition"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- 1/2pmp-33FP-FIRE DOORS-1M, Rev. 4, "Periodic Inspection of Fire doors"

**Open Items and VFDRs**

- None

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

**Beaver Valley Unit 2**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Fire Compartment -** 2-CB-1

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The walls, floor, ceiling, and doors meet the required rating.

The fire barriers of this fire compartment are inspected by procedure to verify by inspection that the exposed surfaces of all fire rated assemblies (walls, floors, and ceilings) are operable.

Evaluation TER-012608 provides unique identifiers to seismic shake space seals that require inspection, and provides a basis for excluding, the shake space seal locations from having a fire rated seal. Since the cover plates alone have not been tested to qualify them as fire rated configurations, the Rodofam beneath them is being added to the combustible loading in each of the various fire areas where it is present.

Overall barrier integrity is not compromised by not providing and maintaining fire rated seals at the subject locations that do not communicate to other fire areas. Unrelated barrier penetrations to other fire areas remain as 3-hour fire rated configurations.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

TER-012608 R0

**References**

- 10080-RC-0010C, Rev. 9, "Control Room EI 707"
- 10080-RP-0068C, Rev. 9, "Sleeve Loc Misc"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-RM-0301A, Rev. 6, "Hazard Boundaries"
- 10080-RS-0015C, Rev. 5, "Misc Framing Contrl Bldg"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CB-1

**Compliance Statement:** Complies  
Complies by Previous Approval

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire Doors: Complies

Doors CR07-3 and 4 separate CB-6 from CB-1. Doors CS25-1 and 2 separate CB-1 from the north and south stairs. Door CS25-3 separates CB-1 from the equipment shaft. IR07-1 and IR12-1 separate CB-1 from stairs. Door IR07-2 separates CB-1 from the equipment shaft. Door A12-1 separates CT-1 from S-1. All doors have a 3-hour fire rating.

Fire Dampers: Complies by previous approval

The following are deviation from the BTP CMEB 9.5-1 is related to 2-CB-1: C.5.a(4) Modified fire dampers (Duct penetrations are provided with two 1 1/2 - hour fire-rated dampers in series). The SSERs concluded both deviations are acceptable.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"
- 10080-RB-0038B, Rev. 4, "AC and Vent Arrang - Contrl bldg"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

#### Supporting EEEEs

- None

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0038A, Rev. 11, "Ac and Vent arrang Control Bldg"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

#### Open Items and VFDRs

- None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment** - 2-CB-1

**Compliance Statement:** Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

#### **Compliance Basis:**

Complies with use of EEEE

Per GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs. The seal design is based on typical tested and approved fire seals. BV2 contains penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 10080-DMC-0054, Rev. 2, Add. 3, "Analysis of Untested Seal Designs"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CB-1

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:**       3.11.5 - ERFBS

**Compliance Basis:**

ERFBS in compartment CB-1 for conduits and cable trays consist of TSI thermo-Lag and 3M Interam wrap used to protect electrical power and control cables for systems and components used for achieving and maintaining safe shutdown conditions. Thermo-Lag installations involve cable in conduits, electrical junction boxes and pull boxes. 3M fire wrap and not Thermo-Lag was utilized for protection of cable tray applications.

Procedures verify on an 18 month frequency, by visual inspection that the exposed surfaces of all fire rated assemblies i.e. fire wrapped conduit, cable trays, ductwork and cable are in operable condition. Fire wraps with indications of degradation are entered into the Corrective Action Program with the applicable compensatory measure implemented by procedure.

Complies

The 3M Interam E 50 series one-hour fire wrap installed on cable trays, conduit and air drops is bound by fire tests. The 3M material was installed in accordance with the manufacturer's installation manuals and the Sergeant Electric installation details for 3M.

Complies with the use of Evaluations

BV-2 through a series of evaluations concluded Thermo-Lag panels and conduit sections having 0.50 inch nominal thickness with pre-buttered or post-buttered joint construction were upgraded to be equivalent to a 1-hour fire rating by achieving a 1 inch thickness.

The 3M Interam E-50 series blanket assemblies were evaluated to provide a one hour fire resistance for the ductwork and a 2 hour fire resistance for protection of the 1-1/2 hour fire dampers.

**Licensing Actions**

- None

**Supporting EEEEs**

10080-DEC-0184 R1 A0  
10080-DEC-0184, Rev. 1  
10080-DEC-0190 R1 A0  
10080-DEC-0191 R0 A0  
12241-B-226 R0 A0

**References**

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 10080-DEC-0184, Rev. 1, "Engineering Evaluation of Thermolag Deviations from Installation Procedures"
- 10080-DEC-0191, Rev. 0, "Thermo-Lag Conduit Eval."
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-DEC-0190, Rev. 1, "Engineering Evaluation of Junction Boxes & Misc. Thermo-Lag Fire Barrier config."
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

**Fire Compartment -** 2-CB-4

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

#### **Compliance Basis:**

2-CB-4, the Control Building Computer Room, is enclosed with reinforced concrete walls and has a 3-hour fire rating. The floor and roof are also constructed of concrete. A procedure verifies by inspection that the exposed surfaces of all fire rated assemblies (walls, floors and ceilings) are operable.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

#### Supporting EEEEs

- None

#### References

- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"  
- 10080-RC-0008R, Rev. 9, "PLN CR EL 735 751"  
- 10080-RE-0037BA, Rev. 12, "SLEEVE DESIGN CONTRL BLDG"  
- 87-05-05, "BV2 SSER "  
- 8700-RC-0008R, Rev. 9, "Plan-EL. 735'-6" & Roof EL. 751'-8" Control Room Extension"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-RB-0038B, Rev. 4, "AC and Vent Arrang - Contrl bldg"  
- 10080-RE-0037A, Rev. 14, "CONDUIT SLV CONTRL BLDG"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

#### Open Items and VFDRs

-None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CB-4

**Compliance Statement:** Complies  
Complies by Previous Approval

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies by Previous Approval

Fire Dampers:

SSER indicated the installation of two 1 1/2 hr. fire dampers in series in lieu of one 3 hr. fire damper was used in various ducts. The SSER concluded the dampers in series are an acceptable deviation.

Complies

Fire Doors:

Fire Compartment has a 3-hour fire rated door and is tested by procedure.

##### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

##### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"  
- 10080-RE-0037A, Rev. 14, "CONDUIT SLV CONTRL BLDG"  
- 87-05-05, "BV2 SSER "  
- 8700-RC-0008R, Rev. 9, "Plan-EL. 735'-6" & Roof EL. 751'-8" Control Room Extension"

##### Supporting EEEEs

- None

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"  
- 10080-RB-0038B, Rev. 4, "AC and Vent Arrang - Contrl bldg"  
- 10080-RE-0037BA, Rev. 12, "SLEEVE DESIGN CONTRL BLDG"  
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

##### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CB-4

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

Per GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs. The seal design is based on typical tested and approved fire seals. BV2 contains penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

**Supporting EEEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-DMC-0054, Rev. 2, Add. 3, "Analysis of Untested Seal Designs"  
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"  
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - 2-CB-5

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

#### **Compliance Basis:**

Complies by Prior Approval

The walls and floors are constructed of concrete and provide a 3 hr. fire rating. Ductwork is wrapped with 1 hour fire wrap. The SSERs concluded the fire wrap on ductwork is an acceptable deviation.

Complies with use of EEEE

Evaluation DEC-0184 evaluates the acceptability of 3M Interam E-50 series blanket assemblies that provide a one hour fire resistance for the ductwork use during a fire for ventilation and a 2 hour fire resistance for the protection of the 1-½ hour fire dampers.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

10080-DEC-0184, Rev. 1

#### References

- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"
- 10080-RE-0037BA, Rev. 12, "SLEEVE DESIGN CONTRL BLDG"
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"
- 10080-RE-0037A, Rev. 14, "CONDUIT SLV CONTRL BLDG"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-RC-0008R, Rev. 9, "Plan-EL. 735'-6" & Roof EL. 751'-8" Control Room Extension"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

#### Open Items and VFDRs

-None



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

**Fire Compartment** - 2-CB-5

**Compliance Statement:** Complies by Previous Approval

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

#### **Compliance Basis:**

Complies by Previous Approval

The FPSSR section 3.7.7 identifies deviations related to CB-5 for having two 1 ½ hour rated fire dampers in lieu of one 3 hour rated damper; 1-hour duct wrap; and modified fire doors. This item is identified as BTP items C.5.a(4) and its acceptance is documented in NRC SSER 3, section 9.5.1.4 and SSER 5, section 9.5.1.7.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEs

10080-DEC-0184 R1 A0

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0038A, Rev. 11, "Ac and Vent arrang Control Bldg"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"
- 10080-RB-0038B, Rev. 4, "AC and Vent Arrang - Contrl bldg"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

#### Open Items and VFDRs

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CB-5

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RE-0037A, Rev. 14, "CONDUIT SLV CONTRL BLDG"
- 10080-RP-0068C, Rev. 9, "Sleeve Loc Misc"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037BA, Rev. 12, "SLEEVE DESIGN CONTRL BLDG"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 8700-RC-0008R, Rev. 9, "Plan-EL, 735'-6" & Roof EL. 751'-8" Control Room Extension"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CB-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

Fire Compartment CB-6 consists of the West Communication Room (707'-6" el).

The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEs**

- None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10080-TLD-033D-014-01, Rev. 4, "FD zone 14 contrl bldg"  
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"  
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"

- 10080-RC-0008R, Rev. 9, "PLN CR EL 735 751"  
- 10080-TLD-033D-014-02, Rev. 4, "FD ZONE 14 CONTRL BLDG"  
- 8700-RC-0008Q, Rev. 10, "Plan @ EL 707'-6" & 725'-6" Control Room Extension"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment** - 2-CB-6

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

#### **Compliance Basis:**

The boundaries of CB-6 are as follows: 2-CB-1 above; below grade to the north and west; 2-CB-1 to the south; 2-CB-1 and 2-S-10 to the east; below grade under CB-6. All walls are 3 hour fire rated.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### References

- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"
- 10080-RC-0010C, Rev. 9, "Control Room EI 707"
- 10080-RE-0037W, Rev. 9, "Concealed conduit and sleeves"
- 10080-RS-0015C, Rev. 5, "Misc Framing Contrl Bldg"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

#### Supporting EEEEs

- None

- 10080-RB-0038A, Rev. 11, "Ac and Vent arrang Control Bldg"
- 10080-RE-0037B, Rev. 11, "Conduit and Sleeves"
- 10080-RP-0068C, Rev. 9, "Sleeve Loc Misc"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

#### Open Items and VFDRs

- None

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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CB-6

**Compliance Statement:** Complies  
Complies by Previous Approval

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire Dampers: Complies by Previous Approval

The following are deviation from the BTP CMEB 9.5-1 is related to 2-CB-6: C.5.a(4) Modified fire dampers (Duct penetrations are provided with two 1 1/2 - hour fire-rated dampers in series). The SSERs concluded both deviations are acceptable.

Fire Doors: Complies

Door CR07-1 separates CB-6 from the north stairs 2-S-10. Doors CR07-03 and 04 separate CB-6 from CB-1. All doors have a 3-hour fire rating. Doors are inspected by procedure.

##### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

##### Supporting EEEEs

- None

##### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0038A, Rev. 11, "Ac and Vent arrang Control Bldg"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"
- 10080-RB-0038B, Rev. 4, "AC and Vent Arrang - Contrl bldg"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

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

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

**Fire Compartment** - 2-CB-6

**Compliance Statement:** Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

#### **Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RE-0037B, Rev. 11, "Conduit and Sleeves"
- 10080-RP-0068C, Rev. 9, "Sleeve Loc Misc"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- 10080-DMC-0054, Rev. 2, Add. 3, "Analysis of Untested Seal Designs"
- 10080-RE-0037W, Rev. 9, "Concealed conduit and sleeves"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

#### Open Items and VFDRs

-None



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

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CP-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

##### Compliance Basis:

Complies

The barriers associated with 2-CP-1 are constructed such that the fire barriers provide a 3-hour fire rating.

Will Comply with Use of Commitment

Perimeter fire barriers for this fire compartment, including exposed surfaces of all fire rated equipment (i.e. walls, floors, ceilings, etc.) and penetration seals, are to be included in an inspection procedure per BV1-1576.

##### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

##### References

- 10080-RA-0006D, Rev. 16, "door schedule"
- 10080-RB-67G, Rev. 7, "Vent arrang waste, fuel, decon, cond polish"
- 10080-RC-0033C, Rev. 11, "Sections & Details Sh. 1 Waste Handling Building"
- 10080-RC-0054C, Rev. 5, "Plan 735'-6" Cond Polish. Bldg"
- 10080-RC-0054G, Rev. 4, "Plan 774'-6" Cond Polish. Bldg"
- 10080-RC-0054N, Rev. 6, "Sections & Details Condensate Polishing Bldg Sh. 3"
- 10080-RE-0037Y, Rev. 16, "Conduit Sleeve Waste Handling"
- 10080-RM-0301E, Rev. 12, "Hazard Boundaries El. 774 - 7"

##### Supporting EEEs

- None

- 10080-RB-0067C, Rev. 7, "vent arrang cond polish bldg"
- 10080-RC-0033A, Rev. 12, "Plans El. 722'-6" & El. 735'-6" Waste Handling Building"
- 10080-RC-0054A, Rev. 4, "Plan E. 722'-6" Outline Condensate Polishing Bldg"
- 10080-RC-0054E, Rev. 7, "Plan E. 752'-6" Outline Condensate Polishing Building"
- 10080-RC-0054J, Rev. 6, "Plan Roof Outline Condensate Polishing Building"
- 10080-RC-0733A, Rev. 8, "Embedments - Penetrations - Opngs El. 722'-6" & 735'-6" Waste Hdlg Bldg"
- 10080-RM-0301D, Rev. 15, "Hazard Boundaries El 760 7"
- 10080-RP-0117M, Rev. 7, "Sleeve Loc Waste Handling"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- |  |   |
|--|---|
| - 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"                    | - 87-05-05, "BV2 SSER "   |
| - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"             | - FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report" |
| - NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986" |   |

**Open Items and VFDRs**

<b>Item Number</b>	BV2-1576	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CP-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Complies

Fire Doors:

The following 3 hr. fire doors separate CP-1 from stairs, passageways or adjacent fire compartments: W-22-3, W-35-1, W-35-3, C-32-1, C-35-1, C-74-6, C-74-8. All doors interfacing with an adjacent fire compartments, except C74-8, are inspected by procedure.

Complies by Previous Approval

Fire Dampers:

The SSERs indicated the installation of two 1 1/2 hr. fire dampers in series in lieu of one 3 hr. fire damper was used in various ducts. Dampers 2HVE-DMPF-29A, 2HVE-DMPF-29B, 2HVE-DMPF-30A, and 2HVE-DMPF-30B are located on the 774'-6" elevation. The SSERs concluded dampers in series are an acceptable deviation.

Will Comply

Fire Doors:

Doors C-74-8, W-35-3 will be added to the appropriate inspection procedure per BV1-1576.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### Supporting EEEEs

- None

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"</li> <li>- 10080-RA-0006D, Rev. 16, "door schedule"</li> <li>- 10080-RB-0067B, Rev. 6, "VENT COND POLISH BLDG"</li> <li>- 10080-RB-0067D, Rev. 9, "VENT COND POLISH "</li> <li>- 10080-RC-0054C, Rev. 5, "Plan 735'-6" Cond Polish. Bldg"</li> <li>- 10080-RC-0054R, Rev. 7, "Sections &amp; Details Condensate Polishing Bldg Sh. 6"</li> <li>- 87-05-05, "BV2 SSER "</li> <li>- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"</li> </ul> | <ul style="list-style-type: none"> <li>- 10080-RA-0006B, Rev. 21, "Door Schedule &amp; Details"</li> <li>- 10080-RA-0010H, Rev. 5, "stair detail cnd polish bldg"</li> <li>- 10080-RB-0067C, Rev. 7, "vent arrang cond polish bldg"</li> <li>- 10080-RB-67G, Rev. 7, "Vent arrang waste, fuel, decon, cond polish"</li> <li>- 10080-RC-0054G, Rev. 4, "Plan 774'-6" Cond Polish. Bldg"</li> <li>- 10080-RC-0733A, Rev. 8, "Embdmnts-Pents-Opngs 722 &amp; 735 Waste Hdlg"</li> <li>- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"</li> </ul> |
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**Open Items and VFDRs**

<b>Item Number</b>	BV2-1576	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CP-1

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

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with Use of Commitment

Perimeter fire barriers for this fire compartment, including exposed surfaces of all fire rated equipment (i.e. walls, floors, ceilings, etc.) and penetration seals, are to be included in an inspection procedure per BV1-1576.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RC-0033A, Rev. 12, "Plans El. 722'-6" & El. 735'-6" Waste Handling Building"
- 10080-RC-0054A, Rev. 4, "Plan E. 722'-6" Outline Condensate Polishing Bldg"
- 10080-RC-0754G, Rev. 7, "Embedments-Penetrations-OPNGS Condensate Polishing Building SH-6"
- 10080-RP-0117M, Rev. 7, "Sleeve Loc Waste Handling"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

#### Supporting EEEs

- 10080-DEC-0190 R1 A0
- 10080-DMC-0054 Rev.2 A4

- 10080-DMC-0054, Rev. 2, Add. 3, "Analysis of Untested Seal Designs"
- 10080-RC-0033B, Rev. 13, "Plans El. 752'-6" & El. 774'-6" Waste Handling Building"
- 10080-RC-0054Q, Rev. 6, "Sections & Details Condensate Polishing Bldg Sh. 5"
- 10080-RP-0117L, Rev. 8, "Sleeve Location Plan Waste Handling BLDG EL. 722'-6", EL> EL 735'-6""
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

<b>Item Number</b>	BV2-1576	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CTP-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Fire compartment 2-CTP-1 consists of the cooling tower pump house and cooling tower. The cooling tower pump house and cooling tower are constructed of concrete which provides a 3 hr. fire barrier. 2-CTP-1 is located in an outdoor area that is spatially separated from other fire compartments.

The only adjoining fire compartment is 3-YARD-1. There are no structures within the yard that are close enough to be affected by smoke or fire from 2-CTP-1.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CTP-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire compartment 2-CTP-1 consists of the cooling tower pump house and cooling tower. 2-CTP-1 is located in an outdoor area that is spatially separated from other fire compartments providing reasonable assurance that a postulated fire would be substantially contained and damage to other fire compartments due to the spread of fire is highly unlikely. The cooling tower pump house and cooling tower are constructed of concrete. The construction provides barriers in excess of the required ratings determined by the fire loading.

The only adjoining fire compartment is 3-YARD-1. Nothing of concern within the yard is close enough to be affected by smoke or fire from 2-CTP-1 and the insurance company prescribes combustible distances similar to NFPA 80 based on available suppression and the fire rating of the wall.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None



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

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CTP-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Fire compartment 2-CTP-1 consists of the cooling tower pump house and cooling tower. 2-CTP-1 is located in an outdoor area that is spatially separated from other fire compartments with no adjoining fire barriers or penetrations.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

Fire Compartment 2-CV-1 consists of the cable vault, rod control area and cable tunnel located on the 735'-6" elevation. The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975.

Complies

Items 1 through 10 with the exception of item 3.

1.   Confirmed detectors are mounted on the ceiling.
2.   There are no significant platforms in the compartment as described in the standard.
4.   Confirmed the fire detectors are periodically tested by the procedure.
5.   Confirmed in this area there are no air duct detectors.
6.   Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7.   Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8.   Confirmed that all circuits between the smoke detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9.   Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10.  There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies with use of EEEE

3.   Verified existing detector spacing is adequate for the hazard based on the limited permanent combustibles, procedural control of transient combustibles, and

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

current location of detectors in FPPCE 12-123.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- FPPCE 12-088 Rev.0
- FPPCE 12-123 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RE-0064C, Rev. 6, "CND PLN FD AUX BLDG 735 & 755"
- 10080-TLD-033D-030-01, Rev. 6, "FD ZONE 30"
- 10080-TLD-033D-030-03, Rev. 6, "FD ZONE 30"
- 10080-TLD-033D-030-05, Rev. 6, "FD ZONE 30 Cable Vault Smoke Det"
- 10080-TLD-033D-050-02, Rev. 4, "FD ZONE 50"
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-RC-0031F, Rev. 7, "MN STM & CABLE VAULT BLDG SLAB 755 6"
- 10080-RE-0064H, Rev. 5, "CND PLN FD MN STM & CA VAULT"
- 10080-TLD-033D-030-02, Rev. 6, "FD ZONE 30"
- 10080-TLD-033D-030-04, Rev. 6, "FD ZONE 30"
- 10080-TLD-033D-050-01, Rev. 4, "FD ZONE 50"
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

- None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CV-1

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

##### Compliance Basis:

Complies

The following critical attributes of the consensus code were evaluated to ensure functionality and reliability:

1.   The CO2 system is designed to obtain a 50% concentration as recommended for cable fires (NFPA 12).
2.   The system is designed to provide 30% concentration in 2 min. and 50% concentration in 7 min., and to maintain 50% concentration for 20 minutes.
3.   The CO2 discharge will occur after a predischage time delay, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate.
4.   Dampers will close upon actuation of the CO2. Fire doors are normally kept closed.
5.   The primary fire suppression system for the area is an individual, automatic, double capacity, total flooding CO2 system. The system can also be initiated manually.
6.   The minimum amount of CO2 is maintained due to dampers that will close upon actuation of the CO2.
7.   Level and Pressure alarms of the storage tanks are available in the control room.
8.   Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9.   The predischage time and the time for CO2 discharge time are tested by procedure 20ST-33.130.
10. Dampers will close upon actuation of the CO2.
11. Overpressurization is prevented by a relief damper.
12. The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

13. A compensatory action plan is required if the CO2 system becomes inoperable.

Complies by Previous Approval

10. Fire doors are normally kept closed. There are unsupervised fire doors in 2-CV-1, which is documented as an accepted deviation in the SSER.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RB-0097A, Rev. 6, "CO2 CV AND ROD CONTROL"
- 10080-TLD-033A-012-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-012-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-013-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-03, Rev. 5, "TLD CO2 Sys 2 Zone 2 Det"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.13A, Rev. 11, "Smoke Detector Test"
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Supporting EEEs**

- 10080-DMC-0054 Rev.2 A4
- 12241-B-226 R0 A0
- FPPCE 12-088 Rev.0
- FPPCE 12-123 Rev.0

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0095A, Rev. 11, "CO2 FP CV AND ROD CONTROL"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-012-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-012-04, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-013-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-02, Rev. 5, "TLD CO2 SYS 2 ZONE 2"
- 2710.180-174-037, Rev. A, "CALC CO2 SYSTEM 2 ZONE 2 CABLE VAULT AND ROD CONTROL"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- 2OST-33.13O, Rev. 0, "MS CV ZONE 2 CO2"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

**Fire Compartment** - 2-CV-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

#### **Compliance Basis:**

Local status lights are provided on 2FPD-CONTPNL2-2 (El. 735) for the 2-CV-1 area, as well as annunciation in the main control room and input to the plant computer. Alarm is on Annunciator window A11-1B for fire detection, window A11-2B for CO2 system discharge, and window A11-3B for CO2 system trouble.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### References

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-TLD-033A-012-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-012-04, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-013-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-02, Rev. 5, "TLD CO2 SYS 2 ZONE 2"

#### Supporting EEEs

- None

- 10080-TLD-033A-012-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-012-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-013-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-03, Rev. 5, "TLD CO2 Sys 2 Zone 2 Det"

#### Open Items and VFDRs

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

**Fire Compartment** - 2-CV-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

#### **Compliance Basis:**

The cable vault and main steam valve area is a Seismic Category I multi-level structure, located adjacent to, and south of, the containment structure

Overpressure problems associated with the CO2 discharge testing in compartment 2-CV-1 have been eliminated by the installation of back draft dampers.

CO2 concentration testing was successfully completed for all CO2 zones and the concentration loss rate is reduced by dampers and air conditioning units tripping closed.

2-CV-1 is not located in the radiologically controlled area. A supplementary leak collection and release system (SLCRS) provides safety related cooling during accident conditions. One function of the SLCRS is to collect potential containment leakage to the cable vault and rod control area. The air is processed and filtered before release to the atmosphere at an elevated point therefore no release of radioactive contaminants is expected.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEs

- None

#### References

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 2OST-33.130, Rev. 0, "MS CV ZONE 2 CO2"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

#### Open Items and VFDRs

- None



## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

Fire Compartment - 2-CV-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.4 - Single active failure

#### Compliance Basis:

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

#### Licensing Actions

#### Supporting EEEEs

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

- None

#### References

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

#### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone, which can be used to prevent the discharge of CO2 when workers are in that zone. The key locked switch is under strict administrative control.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

This room is not normally occupied. In addition, access to this fire compartment is controlled by a security card reader.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

The CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The system is also provided with an odorizer.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0095A, Rev. 11, "CO2 FP CV AND ROD CONTROL"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-012-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-012-04, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-013-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-02, Rev. 5, "TLD CO2 SYS 2 ZONE 2"
- 20ST-33.130, Rev. 0, "MS CV ZONE 2 CO2"

**Supporting EEEEs**

- None

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-RB-0097A, Rev. 6, "CO2 CV AND ROD CONTROL"
- 10080-TLD-033A-012-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-012-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-013-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2"
- 10080-TLD-033A-014-03, Rev. 5, "TLD CO2 Sys 2 Zone 2 Det"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-1

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

**Open Items and VFDRs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**VFDR Number**            BV2-0406            CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

Fire Compartment - 2-CV-1

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.9 - Secondary thermal shock

#### Compliance Basis:

The possibility of secondary thermal shock (cooling) damage is considered credible only to electrical components and cable. Cable trays are located approximately 1-3 feet below the nozzles. Due to the geometry of the area, there are locations where there is nothing of significance close to the CO2 nozzles and locations where trays are in relatively close proximity to the nozzles. A number of cable trays in this area are covered, further shielding those cables from the impingement and thermal effects of a CO2 discharge. Electrical equipment is located closer to the floor below the cable trays. Adequate spacing between the CO2 nozzles and adjacent equipment provides reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

- None

#### References

- 20ST-33.130, Rev. 0, "MS CV ZONE 2 CO2"

#### Open Items and VFDRs

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Based on NFPA 12 and the Fire Protection Handbook, carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. The corrosive characteristics of agent decomposition products are expected to be of very minor concern and acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"
- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

**Open Items and VFDRs**

-None



## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

Beaver Valley Unit 2

##### **Fire Compartment - 2-CV-1**

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

##### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

##### **Compliance Basis:**

Fire Compartment 2-CV-1 is separated from its redundant area, 2-CV-2, by a 12-inch reinforced concrete wall having a 3-hour fire rating except for the 1 hour fire wrap on the ventilation duct.

Complies by Previous Approval

The fire analysis for Area 2-CV-1 determined that a 2-hour fire barrier is required. The ceiling, floor, and walls have a fire rating of 3 hours, which meets the required rating. However, the ductwork is wrapped with a 1-hour fire-wrap material that was accepted in NRC SSER 5 due to the fire area being provided with automatic suppression and detection with local and control room alarms.

Complies with use of EEEE

Evaluation DEC-0184 evaluates the acceptability of 3M Interam E-50 series blanket assemblies that provide a one hour fire resistance for the ductwork use during a fire for ventilation and a 2 hour fire resistance for the protection of the 1-1/2 hour fire dampers. Additionally, evaluation FPPCE 12-123 addresses adequacy of the concrete floor plugs located in the floor/ceiling hoist area opening between 2-CV-3 and 2-CV-1.

##### **Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

##### **Supporting EEEs**

- 10080-DEC-0184 R1 A0
- FPPCE 12-123 Rev.0

##### **References**

- 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

##### Fire Compartment - 2-CV-1

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire Dampers: Complies by Previous Approval

The following are deviations from BTP CMEB 9.5-1 related to 2-CV-1: C.5.a(4) Modified fire dampers (Duct penetrations are provided with two 1 1/2 - hour fire-rated dampers in series); C.5.a(4) Ventilation ductwork is wrapped with 1-hour fire-wrap material to extend the fire barriers in lieu of fire dampers at the barriers. The SSERs concluded both deviations are acceptable.

Fire Doors: Complies

Fire doors A35-2; CV35-1, 2, 3, 4; M35-1; SB30-1 are 3 hr fire rated and separate 2-CV-1 from adjacent fire compartments. Doors are inspected by procedure.

Complies with use of EEEE

FPPCE 13-030 concludes the horizontal sliding door overlap is acceptable.

##### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

##### References

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

##### Supporting EEEEs

FPPCE 13-030 Rev.0

- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RB-0044B, Rev. 8, "VENT ARRANG AUX BLDG"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-1

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0188 R0 A0
- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4
- FPPCE 12-088 Rev.0

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009F, Rev. 5, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037BE, Rev. 14, "SLV DESIGN ROD CNTL BLDG"
- 10080-RE-0037BH, Rev. 11, "SLV AUX BLDG"
- 10080-RE-0037L, Rev. 15, "COND CABLE TUNNEL"
- 10080-RE-0057B, Rev. 5, "CONDUIT PLAN"
- 10080-RP-0117E, Rev. 8, "SLV LOC AUX BLDG"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037BF, Rev. 12, "SLV DESIGN RC-1"
- 10080-RE-0037G, Rev. 19, "CONDUIT & SLV ROD CNTL BLDG"
- 10080-RE-0046Q, Rev. 14, "CONDUIT PLN CONTL BLDG"
- 10080-RP-0116K, Rev. 14, "SLV LOC MS"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

Fire Compartment - 2-CV-1

**Compliance Statement:**   Complies  
                                      Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:**     3.11.5 - ERFBS

#### **Compliance Basis:**

ERFBS in compartment CV-1 for conduits and cable trays consist of TSI thermo-Lag and 3M Interam wrap used to protect electrical power and control cables for systems and components used for achieving and maintaining safe shutdown conditions. Thermo-Lag installations involve cable in conduits, electrical junction boxes and pull boxes. 3M fire wrap and not Thermo-Lag was utilized for protection of cable tray applications.

Procedures verify on an 18 month frequency, by visual inspection that the exposed surfaces of all fire rated assemblies i.e. fire wrapped conduit, cable trays, ductwork and cable are in operable condition. Fire wraps with indications of degradation are entered into the Corrective Action Program with the applicable compensatory measure implemented by procedure.

Complies

The 3M Interam E 50 series one-hour fire wrap installed on cable trays, conduit and air drops is bound by fire tests. The 3M Interam E-50 series blanket assemblies provide a one hour fire resistance for the ductwork and a 2 hour fire resistance for protection of the 1-1/2 hour fire dampers. The 3M material was installed in accordance with the manufacturer's installation manuals and the Sergeant Electric installation details for 3M.

Complies with the use of Evaluations

BV-2 through a series of evaluations concluded Thermo-Lag panels and conduit sections having 0.50 inch nominal thickness with pre-buttered or post-buttered joint construction were upgraded to be equivalent to a 1-hour fire rating by achieving a 1 inch thickness.

#### Licensing Actions

- None

#### Supporting EEEEs

10080-DEC-0184 R1 A0  
10080-DEC-0190 R1 A0  
10080-DEC-0191 R0 A0  
12241-B-226 R0 A0

#### References

- 10080-DEC-0184, Rev. 1, "3M Fire Wrap"

- 10080-DEC-0191, Rev. 0, "Thermo-Lag Conduit Eval."

- 10080-DEC-0190, Rev. 1, "Thermo-Lag JB Misc Design"

- ZOST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

Fire compartment 2-CV-2 is the east cable vault and rod control room (Elevation 735'-6").

The following critical attributes of the fire detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEs**

10080-DMC-0054 Rev.2 A4



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

FPPCE 12-088 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10080-RE-0064AX, Rev. 3, "Cable Block Diagram FD 2DGP-3 2DGP-4"  
- 10080-TLD-033D-031-01, Rev. 4, "FD ZONE 31 CV2"  
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"  
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"

- 10080-RE-0064AV, Rev. 3, "Cable Block Diag Fire Det system"  
- 10080-RE-0064H, Rev. 5, "CND PLN FD MN STM & CA VAULT"  
- 10080-TLD-033D-031-02, Rev. 4, "FD ZONE 31 CV2"  
- 87-05-05, "BV2 SSER "  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The following critical attributes of the consensus code were evaluated to ensure functionality and reliability:

1.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
2.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
3.   The CO2 will discharge after a pre-discharge time delay, during which alarm horns and red lights warn any personnel in the area to evacuate.
4.   Smoke detectors are available in the fire compartment and will actuate the CO2 system if alarmed. This area is equipped with local alarms and alarms in the main control room.
5.   The CO2 system is outfitted with a manual discharge station which is tested.
6.   Fire dampers close to reduce the loss of CO2.
7.   Level and pressure alarms of the storage tanks are available in the control room.
8.   Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9.   A procedure tests the pre-discharge time on a periodic basis.
10.   The are fire dampers that close upon actuation of the CO2. All doors to this compartment are fire-rated doors and are normally closed.
11.   Overpressurization is prevented by a pressure relief damper.
12.   The primary supply for the fire detection system and suppression systems is the normal off-site power supply system. The secondary system for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.
13.   A compensatory action plan is required to be established if the system becomes inoperable.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

Complies by Previous Approval

10. All doors to this compartment are fire-rated doors and are normally closed. There are unsupervised fire doors in 2-CV-2, which is documented as an accepted deviation in the SSER.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RB-0097A, Rev. 6, "CO2 CV AND ROD CONTROL"
- 10080-TLD-033A-015-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-015-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-016-01, Rev. 4, "TLD CO2 SYS ZONE 2 A"
- 10080-TLD-033A-017-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-017-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2A"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.13A, Rev. 11, "Smoke Detector Test"
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- FPPCE 12-088 Rev.0

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-015-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-015-04, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-016-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-017-02, Rev. 5, "TLD CO2 SYS 2 ZONE 2A"
- 2710.180-174-038, Rev. A, "CALC CO2 SYSTEM 2 ZONE 2A CABLE VAULT AND ROD CONTROL"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- 2OST-33.13P, Rev. 1, "MS CV ZONE 2A CO2"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

Local status lights are provided on 2FPD-CONTPNL2-2A (EI. 735) for the 2-CV-2 area, as well as annunciation in the main control room and input to the plant computer. Control room annunciation is combined with other cable vault and rod control areas on Annunciator window A11-1B for fire detection, window A11-2B for CO2 system discharge, and window A11-3B for CO2 system trouble.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- |  |  |
|--|--|
| - 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11" | - 10080-TLD-033A-015-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2A" |
| - 10080-TLD-033A-015-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"       | - 10080-TLD-033A-015-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2A" |
| - 10080-TLD-033A-015-04, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"       | - 10080-TLD-033A-016-01, Rev. 4, "TLD CO2 SYS ZONE 2 A"  |
| - 10080-TLD-033A-016-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"       | - 10080-TLD-033A-017-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2A" |
| - 10080-TLD-033A-017-02, Rev. 5, "TLD CO2 SYS 2 ZONE 2A"       | - 10080-TLD-033A-017-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2A" |

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

The BVPS-2 CO2 system was placed into automatic operation after all of the acceptance tests were successfully performed. This included full CO2 system discharge and observation of the integrity of the area boundary components. The overpressure concerns associated with the CO2 discharge testing have been eliminated by the removal of the CO2 actuators on the fire dampers. The fire dampers can still close from their thermal links fusing. Post modification demonstrated that concentration was achieved and held in addition to no over pressurization occurred.

2-CV-2 is not located in the radiologically controlled area of the plant. The supplementary leak collection and release system (SLCRS) provides safety related cooling during accident conditions. The function of the SLCRS is to collect potential containment leakage to the cable vault and rod control area. The air is processed and filtered before release to the atmosphere therefore no radiological release from 2-CV-2 is expected.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 2OST-33.13P, Rev. 0, "MS CV ZONE 2A CO2"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone which can be used to prevent the discharge of CO2 when workers are in that zone. The keylocked switch is under strict administrative control.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"
- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CV-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

This room is not normally occupied and access is through security doors accessed by card-reader. This ensures that entry to the area is only to perform a specific task in the area and for no other reason.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"

**Open Items and VFDRs**

- None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The system is also provided with an odorizer.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0097A, Rev. 6, "CO2 CV AND ROD CONTROL"
- 10080-TLD-033A-015-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-015-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-016-01, Rev. 4, "TLD CO2 SYS ZONE 2 A"
- 10080-TLD-033A-017-01, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-017-03, Rev. 5, "TLD CO2 SYS 2 ZONE 2A"

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-015-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-015-04, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-016-02, Rev. 4, "TLD CO2 SYS 2 ZONE 2A"
- 10080-TLD-033A-017-02, Rev. 5, "TLD CO2 SYS 2 ZONE 2A"
- 20ST-33.13P, Rev. 0, "MS CV ZONE 2A CO2"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 20M-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

**Open Items and VFDRs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**VFDR Number**            BV2-0406            CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The possibility of secondary thermal shock (cooling) damage is considered credible only to electrical components and cable. Cable trays are located approximately 1-3 feet below the nozzles. Due to the geometry of the area, there are locations where there is nothing of significance close to the CO2 nozzles and locations where trays are in relatively close proximity to the nozzles. A number of cable trays in this area are covered, further shielding those cables from the impingement and thermal effects of a CO2 discharge. Electrical equipment is located closer to the floor below the cable trays. Adequate spacing between the CO2 nozzles and adjacent equipment provides reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 2OST-33.13P, Rev. 0, "MS CV ZONE 2A CO2"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Based on NFPA 12 and the Fire Protection Handbook carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. The corrosive characteristics of agent decomposition products is expected to be of very minor concern and acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Fire Compartment 2-CV-2 is separated from its redundant area, 2-CV-1, by a 12 inch reinforced concrete wall having a 3 hour fire rating. The ceiling, floor, and walls of 2-CV-2 have a fire rating of 3 hours which meets the required rating.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>- 10080-RA-0009F, Rev. 5, "SHAKE SPACE FIRE STOPS"</li><li>- 10080-RE-0037BF, Rev. 12, "SLV DESIGN RC-1"</li><li>- 10080-RE-0046Q, Rev. 14, "CONDUIT PLN CNTL BLDG"</li><li>- 10080-RP-0116K, Rev. 14, "SLV LOC MS"</li><li>- 87-05-05, "BV2 SSER "</li><li>- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"</li></ul> | <ul style="list-style-type: none"><li>- 10080-RE-0037BE, Rev. 14, "SLV DESIGN ROD CNTL BLDG"</li><li>- 10080-RE-0037G, Rev. 19, "CONDUIT &amp; SLV ROD CNTL BLDG"</li><li>- 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"</li><li>- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"</li><li>- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"</li></ul> |
|---|--|

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Dampers: Complies by Previous Approval

The following are deviation from the BTP CMEB 9.5-1 is related to 2-CV-2: C.5.a(4) Modified fire dampers (Duct penetrations are provided with two 1 1/2 – hour fire-rated dampers in series). The SSERs concluded both deviations are acceptable.

Fire Doors: Complies

Fire doors are 3 hr fire rated and separate 2-CV-2 from adjacent fire compartments. Doors are inspected by procedure.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"</li><li>- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"</li><li>- 87-05-05, "BV2 SSER "</li><li>- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"</li></ul> | <ul style="list-style-type: none"><li>- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"</li><li>- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"</li><li>- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"</li></ul> |
|---|---|

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-2**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0188 R0 A0
- 10080-DMC-0054 Rev.2 A4
- FPPCE 12-088 Rev.0

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "
- 10080-DEC-0188, Rev. 0, "Thermo-Lag fire barrier Evaluation of Non-Rated assemblies"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-3**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

Fire Compartment 2-CV-3 consists of the cable vault and rod control area located on the 755'-6" elevation. The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Complies

Items 2 through 10 with the exception of item 3.

2.   There are no significant platforms in the compartment as described in the standard.
4.   Confirmed the fire detectors are periodically tested by the procedure.
5.   Confirmed in this area there are no air duct detectors.
6.   Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7.   Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8.   Confirmed that all circuits between the smoke detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9.   Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10.  There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies with use of EEEE

1. Five detectors are mounted below the ceiling at a level equal to the bottom of the beams and was found to be acceptable
3. Verified existing detector spacing is adequate for the hazard based on air flow, detector locations, and alarm procedures as evaluated in FPPCE 13-044.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and  
Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEs**

10080-DMC-0054 Rev.2 A4  
FPPCE 12-088 Rev.0  
FPPCE 12-123 Rev.0  
FPPCE 13-044 Rev.0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10080-TLD-033D-032-02, Rev. 4, "FD ZONE 32 Cable Vault Smoke Det"  
- 87-05-05, "BV2 SSER "  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 10080-TLD-033D-032-01, Rev. 4, "FD zone 32 Cable Vault"  
- 20ST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation  
Test"  
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD  
System"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-3**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The following critical attributes of the consensus code were evaluated to ensure functionality and reliability:

1.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
2.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
3.   The CO2 will discharge after a pre-discharge time delay during which alarm horns and revolving red lights warn any personnel in the area to evacuate.
4.   Smoke detectors are available in the fire compartment and will actuate the CO2 system if alarmed. This area is equipped with local alarms and alarms in the main control room.
5.   CO2 system is outfitted with a manual discharge station which is tested by procedure.
6.   Fire dampers and area supply and exhaust fans close or trip to reduce the loss of CO2 concentration.
7.   Level and Pressure alarms of the storage tanks are available in the control room.
8.   Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9.   A procedure tests the pre-discharge time on a periodic basis.
10.  There are four fire dampers that will close upon actuation of the CO2.
11.  Overpressurization is prevented by a pressure relief damper.
12.  The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.
13.  A compensatory action plan is required to be established if the system becomes inoperable.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

Complies by Previous Approval

10. All doors to this compartment are fire-rated doors and are normally closed. There are unsupervised fire doors in 2-CV-3, which is documented as an accepted deviation in the SSER.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0097A, Rev. 6, "CO2 CV AND ROD CONTROL"
- 10080-TLD-033A-018-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-018-03, Rev. 5, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-019-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 FLOW"
- 10080-TLD-033A-020-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 DET"
- 10080-TLD-033A-020-03, Rev. 5, "TLD CO2 Sys 2 Zone 3 Det"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.13A, Rev. 11, "Smoke Detector Test"
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- FPPCE 12-088 Rev.0
- FPPCE 12-123 Rev.0
- TER-011403 R0

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-018-02, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-018-04, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-019-02, Rev. 4, "TLD CO2 SYS 2 ZONE 3 FLOW"
- 10080-TLD-033A-020-02, Rev. 5, "TLD-CO2 SYS 2 ZONE 3 DET"
- 2710.180-174-039, Rev. A, "CALC CO2 SYSTEM 2 ZONE 3 CABLE VAULT AND ROD CONTROL"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- 2OST-33.13Q, Rev. 0, "MAIN STM CV ZONE 3 CO2 PUFF TEST"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

Beaver Valley Unit 2

**Fire Compartment -** 2-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

Local status lights are provided on 2FPD-CONTPNL2-3 (El. 755) for area 2-CV-3, as well as annunciation in the main control room and input to the plant computer. Control room annunciation is combined with other cable vault and rod control areas on Annunciator window A11-1B for fire detection, window A11-2B for CO2 system discharge, and window A11-3B for CO2 system trouble.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-TLD-033A-018-02, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-018-04, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-019-02, Rev. 4, "TLD CO2 SYS 2 ZONE 3 FLOW"
- 10080-TLD-033A-020-02, Rev. 5, "TLD-CO2 SYS 2 ZONE 3 DET"

- 10080-TLD-033A-018-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-018-03, Rev. 5, "TLD CO2 SYS 2 ZONE 3 VLV"
- 10080-TLD-033A-019-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 FLOW"
- 10080-TLD-033A-020-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 DET"
- 10080-TLD-033A-020-03, Rev. 5, "TLD CO2 Sys 2 Zone 3 Det"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

The cable vault and main steam valve area is a Seismic Category I multi-level structure, located adjacent to, and south of, the containment structure.

The overpressure concerns associated with the CO2 discharge testing have been eliminated by the installation of back draft dampers where required.

The loss rate of CO2 concentration is controlled by dampers and air conditioning units tripping closed.

2-CV-3 is not located in the radiologically controlled area of the plant. The supplementary leak collection and release system (SLCRS) provides safety related cooling during accident conditions. The function of the SLCRS is to collect potential containment leakage. The air is processed and filtered before release to the atmosphere at an elevated point; therefore, no radiological release for 2-CV-3 is expected.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 20ST-33.13Q, Rev. 0, "MAIN STM CV ZONE 3 CO2 PUFF TEST"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Supporting EEEEs**

- None

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

- None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone which can be used to prevent the discharge of CO2 when workers are in that zone. The key locked switch is under strict administrative control.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"
- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

This room is not normally occupied and access is through security doors accessed by a card-reader. This ensures that entry to the area is only to perform a specific task in the area and for no other reason.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The system is also provided with an odorizer.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"</li><li>- 10080-RB-0097A, Rev. 6, "CO2 CV AND ROD CONTROL"</li><br/><li>- 10080-TLD-033A-018-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"</li><li>- 10080-TLD-033A-018-03, Rev. 5, "TLD CO2 SYS 2 ZONE 3 VLV"</li><li>- 10080-TLD-033A-019-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 FLOW"</li><li>- 10080-TLD-033A-020-01, Rev. 4, "TLD CO2 SYS 2 ZONE 3 DET"</li><li>- 10080-TLD-033A-020-03, Rev. 5, "TLD CO2 Sys 2 Zone 3 Det"</li></ul> | <ul style="list-style-type: none"><li>- 10080-RB-0090B, Rev. 21, "Flow Diagram FP &amp; Smoke Det System "</li><br/><li>- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"</li><li>- 10080-TLD-033A-018-02, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"</li><li>- 10080-TLD-033A-018-04, Rev. 4, "TLD CO2 SYS 2 ZONE 3 VLV"</li><li>- 10080-TLD-033A-019-02, Rev. 4, "TLD CO2 SYS 2 ZONE 3 FLOW"</li><li>- 10080-TLD-033A-020-02, Rev. 5, "TLD-CO2 SYS 2 ZONE 3 DET"</li><li>- 20ST-33.13Q, Rev. 0, "MAIN STM CV ZONE 3 CO2 PUFF TEST"</li></ul> |
|--|--|

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-3

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

**Open Items and VFDRs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**VFDR Number**      BV2-0406      CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The possibility of secondary thermal shock (cooling) damage is considered credible only to electrical components and cable. Cable trays are located approximately 1-3 feet below the nozzles. Due to the geometry of the area, there are locations where there is nothing of significance close to the CO2 nozzles and locations where trays are in relatively close proximity to the nozzles. A number of cable trays in this area are covered, further shielding those cables from the impingement and thermal effects of a CO2 discharge. Electrical equipment is located closer to the floor below the cable trays. Adequate spacing between the CO2 nozzles and adjacent equipment provides reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 2OST-33.13Q, Rev. 0, "MAIN STM CV ZONE 3 CO2 PUFF TEST"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Based on NFPA 12 and the Fire Protection Handbook, carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. The corrosive characteristics of agent decomposition products are expected to be of very minor concern and acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-3**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The ceiling, floor, and walls have a fire rating of 3 hrs which meets the required rating.

Complies with use of EEEE

Evaluations have been developed to justify the following:   --

The acceptability of 3M Interam E-50 series blanket assemblies that provide a one hour fire resistance for the ductwork use during a fire for ventilation and a 2 hour fire resistance for the protection of the 1-½ hour fire dampers.

The existing fire barrier that separates plant fire areas 2-CV-3 and 2-CV-6, consists of a concrete wall which was originally constructed with a gap of approximately two inches at its top. This gap was filled with a combustible joint filler material with no fire barrier properties. The fire barrier at this location was completed, during original plant construction, by the installation of Thermo-Lag panels enclosing the 2-CV-6 side of this filled wall gap, with the intent of providing 3 hour fire-rated separation between the two fire areas.

Removable concrete floor slabs/plugs are arranged such that a shelf exists either at or near mid depth of both the opening and the removable slab, with the slab sitting on the shelf.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0184, Rev. 1
- FPPCE 12-123 Rev.0
- TER-011403 R0

**References**

- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EI 760 7"
- 87-05-05, "BV2 SSER "
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-3**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Dampers: Complies by Previous Approval

The following are deviations from BTP CMEB 9.5-1 related to 2-CV-1: C.5.a(4) Modified fire dampers (Duct penetrations are provided with two 1 1/2 - hour fire-rated dampers in series); C.5.a(4) Ventilation ductwork is wrapped with 1-hour fire-wrap material to extend the fire barriers in lieu of fire dampers at the barriers. The SSERs concluded both deviations are acceptable.

Fire Doors: Complies

Fire doors are 3 hr fire rated and separate 2-CV-3 from adjacent fire compartments. Doors are inspected by procedure.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- |  |  |
|--|--|
| - 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check" | - 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule" |
| - 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"                                | - 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"  |
| - 10080-RC-0031E, Rev. 9, "MN STM & CABLE VAULT BLDG"                                      | - 87-05-05, "BV2 SSER "                            |
| - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"                     |  |

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-3**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0188 R0 A0
- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4
- FPPCE 12-088 Rev.0

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009F, Rev. 5, "SHAKE SPACE FIRE STOPS"
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"
- 10080-RE-0037BF, Rev. 12, "SLV DESIGN RC-1"
- 10080-RE-0037L, Rev. 15, "COND CABLE TUNNEL"
- 10080-RE-0046R, Rev. 12, "CONDUIT CNTL BLDG 735"
- 10080-RP-0117G, Rev. 10, "SLEEVE AUX BLDG "
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037BE, Rev. 14, "SLV DESIGN ROD CNTL BLDG"
- 10080-RE-0037G, Rev. 19, "CONDUIT & SLV ROD CNTL BLDG"
- 10080-RE-0037M, Rev. 12, "conduit and sleeve cable tunnel"
- 10080-RP-0116L, Rev. 8, "SLEEVE LOC"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

Fire Compartment - 2-CV-3

**Compliance Statement:**   Complies  
  Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:**     3.11.5 - ERFBS

#### **Compliance Basis:**

ERFBS in compartment CV-3 for conduits and cable trays consist of TSI thermo-Lag and 3M Interam wrap used to protect electrical power and control cables for systems and components used for achieving and maintaining safe shutdown conditions. Thermo-Lag installations involve cable in conduits, electrical junction boxes and pull boxes. 3M fire wrap and not Thermo-Lag was utilized for protection of cable tray applications.

The procedure verifies on an 18 month frequency, by visual inspection that the exposed surfaces of all fire rated assemblies i.e. fire wrapped conduit, cable trays, ductwork and cable are in operable condition. Fire wraps with indications of degradation are entered into the Corrective Action Program with the applicable compensatory measure implemented by procedure.

Complies

The 3M Interam E 50 series one-hour fire wrap installed on cable trays, conduit and air drops is bound by fire tests. The 3M Interam E-50 series blanket assemblies provide a one hour fire resistance for the ductwork and a 2 hour fire resistance for protection of the 1-1/2 hour fire dampers. The 3M material was installed in accordance with the manufacturer's installation manuals and the Sergeant Electric installation details for 3M.

Complies with the use of Evaluations

BV-2 through a series of evaluations concluded Thermo-Lag panels and conduit sections having 0.50 inch nominal thickness with pre-buttered or post-buttered joint construction were upgraded to be equivalent to a 1-hour fire rating by achieving a 1 inch thickness.

#### **Licensing Actions**

- None

#### **Supporting EEEEs**

10080-DEC-0184 R1 A0  
10080-DEC-0184, Rev. 1  
10080-DEC-0190 R1 A0  
10080-DEC-0191 R0 A0

#### **References**

- 10080-DEC-0184, Rev. 1, "3M Fire Wrap"  
- 10080-DEC-0191, Rev. 0, "Thermo-Lag Conduit Eval."  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-DEC-0190, Rev. 1, "Thermo-Lag JB Misc Design"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-4**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The fire analysis for 2-CV-4 determined a fire barrier of 2 1/2 hours is required. The walls, ceiling, and floor have a fire rating of three hours, which exceeds that required by the fire analysis.

The acceptability of 3M Interam E-50 series blanket assemblies that provide a one hour fire resistance for the ductwork use during a fire for ventilation and a 2 hour fire resistance for the protection of the 1-1/2 hour fire dampers is justified by evaluation.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

10080-DEC-0184 R1 A0

**References**

- 10080-RM-0301E, Rev. 12, "Hazard Boundaries El. 774 - 7"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 2-CV-4

**Compliance Statement:** Complies  
Complies by Previous Approval

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire Dampers:

Complies by Previous Approval

SSERs stated that the installation of two 1 1/2 hr. fire dampers in series in lieu of one 3 hr. fire damper was used in various ducts. The SSERs concluded that the dampers in series are an acceptable deviation.

Fire Doors:

Complies

Fire doors are all 3-hr fire rated and are inspected by procedure.

##### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

##### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

##### Supporting EEEs

- None

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

##### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-4

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEs**

10080-DMC-0054 Rev.2 A4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RE-0037BY, Rev. 7, "Slv Design Rod Cntl Bldg"
- 10080-RP-0116M, Rev. 9, "Slv MS 773"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037BZ, Rev. 12, "Cnd & Slv CV"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-5**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Fire compartment 2-CV-5 is separated from surrounding areas by 3-hour, fire-rated walls, floor, and ceiling. The fire barriers of this fire compartment are inspected by procedure. 20ST-33.35 verifies by inspection that the exposed surfaces of all fire rated assemblies (walls, floors, and ceilings) are operable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- |  |   |
|--|---|
| - 1/2-ADM-1900, Rev. 28, "Fire Protection Program"                     | - 10080-RM-0301E, Rev. 12, "Hazard Boundaries El. 774 - 7"      |
| - 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"        | - 87-05-05, "BV2 SSER "   |
| - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report" | - FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report" |

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

#### Fire Compartment - 2-CV-5

**Compliance Statement:** Complies by Previous Approval

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

#### Compliance Basis:

The following are deviations from BTP CMEB 9.5-1 related to CV-5: C.5.a (4) Modified fire dampers, C.5.a (5) Modified fire doors. Their acceptance is documented in NRC SSER 5 dated May 1987.

#### Fire Dampers:

Dampers are rated at 1 ½-hour fire rating and installed in pairs. Duct penetrations are provided with two 1 1/2-hour fire-rated dampers in series based on drawings. Dampers are inspected by procedure.

#### Fire Doors:

Fire doors CV67-1 and CV73-2 are 3 hr fire rated and separate 2-CV-5 from adjacent fire compartments. All doors have a 3-hour fire rating based on drawings. Doors are inspected by procedure.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

- None

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

#### Open Items and VFDRs

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-5**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>- 1/2-PIP-M16, Rev. 9, "Penetration Seals"</li><li>- 10080-RA-0009F, Rev. 5, "SHAKE SPACE FIRE STOPS"</li><li>- 10080-RE-0037BZ, Rev. 12, "Cnd &amp; Slv CV"</li><li>- 10080-RP-0116M, Rev. 9, "Slv MS 773"</li><li>- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"</li><li>- B-240, Rev. 0, "Fire Seal Eval Untested Design"</li></ul> | <ul style="list-style-type: none"><li>- 10080-DMC-0054, Rev. 2, "Untested Seal Design"</li><li>- 10080-RE-0037BY, Rev. 7, "Slv Design Rod Cntl Bldg"</li><li>- 10080-RE-0037X, Rev. 13, "CND &amp; SLV FUEL &amp; DECON BLDG"</li><li>- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"</li><li>- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"</li></ul> |
|--|---|

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

Fire Compartment 2-CV-6 consists of the Cable Vault and Rod Control Relay Room located on the 755'-6" elevation.

The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and  
Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RC-0036E, Rev. 10, "PLAN AUX BLDG EL 773"
- 10080-TLD-033D-053-01, Rev. 4, "FD ZONE 53 AB SD"
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 10080-RC-0036D, Rev. 6, "PLAN 735 AUX BLDG"
- 10080-RE-0064C, Rev. 6, "CND PLN FD AUX BLDG 735 & 755"
- 10080-TLD-033D-053-02, Rev. 4, "FD ZONE 53 AB SD"
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-6**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The following critical attributes of the NFPA code were evaluated to ensure functionality and reliability:

1.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
2.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
3.   The CO2 will discharge after a pre-discharge time delay, during which alarm horns and revolving red lights warn any personnel in the area to evacuate.
4.   Smoke detectors are available in the fire compartment and will actuate the CO2 system if alarmed. This area is equipped with local alarms and alarms in the main control room
5.   CO2 system is outfitted with a manual discharge station which is tested by procedure.
6.   Fire dampers and area supply and exhaust fans close or trip to reduce the loss of CO2 concentration.
7.   Level and Pressure alarms of the storage tanks are available in the control room.
8.   Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9.   A procedure tests the pre-discharge time on a periodic basis.
10.  There are fire dampers that will close upon actuation of the CO2.
11.  Overpressurization is prevented by a pressure relief damper.
12.  The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

13. A compensatory action plan is required to be established if the system becomes inoperable.

Complies by Previous Approval

10. All doors to this compartment are fire-rated doors and are normally closed. There are unsupervised fire doors in 2-CV-6, which is documented as an accepted deviation in the NUREG 1057 SSER.

Will Comply with Use of Commitment

A modification is required and is included in LAR Attachment S as BV2-1438 to relocate actuation detectors in 2-CV-6 as needed to resolve non-compliance with NFPA 72E requirements. Additionally, the CO2 vendor's calculation will be located or justified [Action Item BV2-0487].

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

10080-DMC-0054 Rev.2 A4  
 TER-011403 R0

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RB-0090C, Rev. 10, "Flow Diagram CO2 (Halon) Fire Protection & Smoke Detection System SH-3"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-030-02, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-030-04, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-031-02, Rev. 2, "TLD CO2 SYS 2 ZONE 7 FLOW"
- 10080-TLD-033A-032-02, Rev. 3, "TLD CO2 SYS 2 ZONE 7 DET"
- 2010.190-174-106, Rev. C, "CO2 System Sprinklers Relay Room Zone 7"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.13A, Rev. 11, "Smoke Detector Test"
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0095A, Rev. 11, "CO2 FP CV AND ROD CONTROL"
- 10080-TLD-033A-030-01, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-030-03, Rev. 4, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-031-01, Rev. 2, "TLD-CO2 SYS 2 ZONE 7 FLOW"
- 10080-TLD-033A-032-01, Rev. 2, "TLD CO2 SYS 2 ZONE 7 DET"
- 10080-TLD-033A-032-03, Rev. 3, "TLD CO2 SYS 2 ZONE 7 DET"
- 2710.180-174-039, Rev. A, "CALC CO2 SYSTEM 2 ZONE 3 CABLE VAULT AND ROD CONTROL"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- 2OST-33.13U, Rev. 1, "RELAY RM ZONE 7 CO2 PUFF TEST"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

<b>Item Number</b>	BV2-0487	<b>Item Title:</b> Need to find CO2 Flow and Concentration Calculation for 2-CV-6
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

Local status lights are provided on 2FPD-CONTPNL2-7 (El. 755) as well as annunciation in the main control room and input to the plant computer. Control room annunciation is on Annunciator window A11-1B for fire detection, window A11-2B for CO2 system discharge, and window A11-3B for CO2 system trouble.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-TLD-033A-030-02, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-030-04, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-031-02, Rev. 2, "TLD CO2 SYS 2 ZONE 7 FLOW"
- 10080-TLD-033A-032-02, Rev. 3, "TLD CO2 SYS 2 ZONE 7 DET"
- 10080-TLD-033A-030-01, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-030-03, Rev. 4, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-031-01, Rev. 2, "TLD-CO2 SYS 2 ZONE 7 FLOW"
- 10080-TLD-033A-032-01, Rev. 2, "TLD CO2 SYS 2 ZONE 7 DET"
- 10080-TLD-033A-032-03, Rev. 3, "TLD CO2 SYS 2 ZONE 7 DET"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

Beaver Valley Unit 2

**Fire Compartment** - 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

The cable vault and main steam valve area is a Seismic Category I multi-level structure, located adjacent to, and south of, the containment structure.

The BVPS-2 CO2 system was placed into automatic operation after all of the acceptance tests were successfully performed. This included full CO2 system discharge and observation of the integrity of the area boundary components. The overpressure concerns associated with the CO2 discharge testing have been eliminated by the installation of back draft dampers where required. Loss of CO2 is controlled by dampers and air conditioning units.

2-CV-6 is not located in the radiologically controlled area of the plant. The supplementary leak collection and release system (SLCRS) provides safety related cooling during accident conditions. The function of the SLCRS is to collect potential containment leakage. The air is processed and filtered before release to the atmosphere at an elevated point; therefore, radiological contaminants would be contained.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-RB-0090C, Rev. 10, "Flow Diagram CO2 (Halon) Fire Protection & Smoke Detection System SH-3"
- 2OST-33.13U, Rev. 1, "RELAY RM ZONE 7 CO2 PUFF TEST"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone which can be used to prevent the discharge of CO2 when workers are in that zone. The key locked switch is under strict administrative control.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"
- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

This room is not normally occupied and access is through security doors accessed by a card-reader. This ensures that entry to the area is only to perform a specific task in the area and for no other reason.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The system is also provided with an odorizer.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0095A, Rev. 11, "CO2 FP CV AND ROD CONTROL"
- 10080-TLD-033A-030-01, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-030-03, Rev. 4, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-031-01, Rev. 2, "TLD-CO2 SYS 2 ZONE 7 FLOW"
- 10080-TLD-033A-032-01, Rev. 2, "TLD CO2 SYS 2 ZONE 7 DET"
- 10080-TLD-033A-032-03, Rev. 3, "TLD CO2 SYS 2 ZONE 7 DET"
- 10080-RB-0090C, Rev. 10, "Flow Diagram CO2 (Halon) Fire Protection & Smoke Detection System SH-3"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-033A-030-02, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-030-04, Rev. 3, "TLD CO2 SYS 2 ZONE 7 VLV"
- 10080-TLD-033A-031-02, Rev. 2, "TLD CO2 SYS 2 ZONE 7 FLOW"
- 10080-TLD-033A-032-02, Rev. 3, "TLD CO2 SYS 2 ZONE 7 DET"
- 20ST-33.13U, Rev. 1, "RELAY RM ZONE 7 CO2 PUFF TEST"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-6**

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 20M-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

**Open Items and VFDRs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**VFDR Number**      BV2-0406      CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The possibility of secondary thermal shock (cooling) damage is considered credible only to electrical components and cable. Cable trays are located approximately 1-3 feet below the nozzles. Due to the geometry of the area, there are locations where there is nothing of significance close to the CO2 nozzles and locations where trays are in relatively close proximity to the nozzles. A number of cable trays in this area are covered, further shielding those cables from the impingement and thermal effects of a CO2 discharge.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 2OST-33.13U, Rev. 1, "RELAY RM ZONE 7 CO2 PUFF TEST"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-6

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Based on NFPA 12 and the Fire Protection Handbook, carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. The corrosive characteristics of agent decomposition products are expected to be of very minor concern and acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"
- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-CV-6

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The 3 walls that are common to fire area 2-CV-3 have a fire rating of two hours. TER-011403 evaluates the acceptability of revising the rating of the fire barrier between plant fire areas; 2-CV-3, Cable Vault El. 755'-6": and 2-CV-6, Relay Room El. 755'-6". The rating of this fire barrier will be changed from 3 hours to 2 hours. The existing fire barrier that separates plant fire areas 2-CV-3 and 2-CV-6, consists of a concrete wall, which was originally constructed with a gap of approximately two inches at its top. This gap was filled with a combustible joint filler material with no fire barrier properties.

The wall between 2-CV-6 & 2-FB-1 has a fire rating of 3 hours.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

TER-011403 R0

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0036A, Sht. 1, Rev. 16, "Plans Auxiliary Building"
- 10080-RM-0301D, Rev. 15, "Hazard Boundaries El 760 7"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-CV-6**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

Doors that separate 2-CV-6 from adjacent fire compartments are 3-hour fire rated. Doors are periodically inspected by procedure.

Complies by Previous Approval

Fire Dampers:

The following are deviation from the BTP CMEB 9.5-1 is related to 2-CV-6: C.5.a(4) Modified fire dampers (Duct penetrations are provided with two 1 1/2 – hour fire-rated dampers in series). The SSERs concluded both deviations are acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"</li><li>- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"</li><li>- 10080-RA-0036A, Sht. 1, Rev. 16, "Plans Auxiliary Building"</li><li>- 87-05-05, "BV2 SSER "</li><li>- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"</li></ul> | <ul style="list-style-type: none"><li>- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"</li><li>- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"</li><li>- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"</li><li>- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"</li></ul> |
|---|--|

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-CV-6

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Oversized blockouts in various 3 hour fire rated floors have penetration seals that have supplementary structural steel have been evaluated. The penetration seal is only required to support its own weight and no other loads.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037M, Rev. 12, "conduit and sleeve cable tunnel"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037L, Rev. 15, "COND CABLE TUNNEL"
- 10080-RP-0117G, Rev. 10, "SLEEVE AUX BLDG "
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-1**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The following critical attributes of the consensus code were evaluated to ensure functionality and reliability:

1.   A 34% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 34% is achieved.
2.   A 34% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 34% is achieved.
3.   The CO2 will discharge after a pre-discharge time delay during which alarm horns and revolving red lights warn any personnel in the area to evacuate.
4.   Heat detectors are available in the fire compartment and will actuate the CO2 system if alarmed. This area is equipped with local alarms and alarms in the main control room.
5.   CO2 system is outfitted with a manual discharge station which is tested by procedure.
6.   This CO2 area requires dampers which are motor operated.
7.   Level and Pressure alarms of the storage tanks are available in the control room.
8.   Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9.   A procedure tests the pre-discharge time on a periodic basis.
10.   This CO2 area requires dampers which are motor operated.
11.   An overpressure relief path is not applicable in this area.
12.   The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

13. A compensatory action plan is required to be established if the system becomes inoperable.

Complies by Previous Approval

10. All doors to this compartment are fire-rated doors and are normally closed. There are unsupervised fire doors in 2-DG-1, which is documented as an accepted deviation in the SSER.

Complies with Clarification

10. The room exhaust fans trip off on an independent circuit.

Will Comply with the Use of Commitment

10. Procedural changes to pre-fire plans are being implemented to confirm the room exhaust ventilation fan is shut off, and, if necessary, discharge a second shot of CO2 into the space.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"  
 - 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"  
 - 10080-RE-0034AU, Rev. 8, "Cable Tray Arrangement diesel Gen bldg"  
 - 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"  
 - 10080-TLD-33A-024-02, Rev. 5, "TLD FP CO2 System Zone 5"  
 - 10080-TLD-33A-024-04, Rev. 5, "TLD-FP CO2 System Zone 5"  
 - 10080-TLD-33A-025-02, Rev. 5, "TLD FP CO2 System Zone 5"  
 - 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"  
 - 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "  
 - 2OST-33.13S, Rev. 1, "South Diesel Zone 5 CO2 Puff Test"  
 - 2PFP-DGBX-732-DG-1, Rev. 3, "DIESEL GENERATOR 2-1 ROOM FIRE AREA DG-1"

**Supporting EEEEs**

- None

- 10080-LSK-20-2F, Rev. 10, "Logic Diagram CO2 FP system"  
 - 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"  
 - 10080-RM-0013A, Rev. 8, "Arrangement Diesel Gen Bldg"  
 - 10080-TLD-33A-024-01, Rev. 5, "TLD FP CO2 System Zone 5"  
 - 10080-TLD-33A-024-03, Rev. 6, "TLD FP CO2 System Zone 5"  
 - 10080-TLD-33A-025-01, Rev. 5, "TLD FP CO2 System Zone 5"  
 - 2710.180-174-041, Rev. A, "CALC CO2 SYSTEM 2 ZONE 5 DIESEL GENERATOR BUILDING"  
 - 2DBD-33B, Rev. 10, "Fire Protection System"  
 - 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"  
 - 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"  
 - 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Open Items and VFDRs**

<b>Item Number</b>	BV2-1022	<b>Item Title:</b> Perform Procedural Enhancements to Pre-fire Plans for 2-DG-1, 2-DG-2 Control Circuits Vent Fans
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-DG-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

Local status lights are provided on 2FPD-CONTPNL2-5 (El. 732) as well as annunciation in the main control room and input to the plant computer. Control room alarms are Annunciator window A11-1D for fire detection alarm, Annunciator window A11-2D for CO2 system discharge, and Annunciator window A11-3D for CO2 system trouble.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"  
- 10080-TLD-33A-024-02, Rev. 5, "TLD FP CO2 System Zone 5"

- 10080-TLD-33A-024-01, Rev. 5, "TLD FP CO2 System Zone 5"  
- 10080-TLD-33A-024-03, Rev. 6, "TLD FP CO2 System Zone 5"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-1**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

Complies

The BVPS-2 CO2 system was placed into automatic operation after all of the acceptance tests were successfully performed. This included full CO2 system discharge and observation of the integrity of the area boundary components. It was then determined that adequate relief openings existed in the boundary openings to the outside from the fire compartment.

This fire compartment is not located within the radiologically controlled area. There are no radiological considerations for fire compartment 2-DG-1.

Complies with Clarification

The room exhaust fans trip off on an independent circuit.

Will Comply with the Use of a Commitment

Procedural changes to pre-fire plans are being implemented to confirm the room exhaust ventilation fan is shut off, and, if necessary, discharge a second shot of CO2 into the space.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 2OST-33.13S, Rev. 1, "South Diesel Zone 5 CO2 Puff Test"  
  
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 2PFP-DGBX-732-DG-1, Rev. 3, "DIESEL GENERATOR 2-1 ROOM FIRE AREA DG-1"  
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

**Item Number**

BV2-1022

**Item Title:** Perform Procedural Enhancements to Pre-fire Plans for 2-DG-1, 2-DG-2 Control Circuits Vent Fans

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-DG-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone which can be used to prevent the discharge of CO2 when workers are in that zone. The key locked switch is under strict administrative control.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"

- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

This room is not normally occupied and access is through security doors accessed by card-reader. This ensures that entry to the area is only to perform a specific task in the area and for no other reason.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-DG-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The system is also provided with an odorizer.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-LSK-20-2F, Rev. 10, "Logic Diagram CO2 FP system"

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"

- 10080-TLD-33A-024-02, Rev. 5, "TLD FP CO2 System Zone 5"

- 10080-TLD-33A-024-04, Rev. 5, "TLD-FP CO2 System Zone 5"

- 10080-TLD-33A-025-02, Rev. 5, "TLD FP CO2 System Zone 5"

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"

- 10080-TLD-33A-024-01, Rev. 5, "TLD FP CO2 System Zone 5"

- 10080-TLD-33A-024-03, Rev. 6, "TLD FP CO2 System Zone 5"

- 10080-TLD-33A-025-01, Rev. 5, "TLD FP CO2 System Zone 5"

- 20ST-33.13S, Rev. 1, "South Diesel Zone 5 CO2 Puff Test"

**Open Items and VFDRs**

-None



## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

Fire Compartment - 2-DG-1

**Compliance Statement:** Will Comply with the Use of Commitment

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

#### **Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

#### Licensing Actions

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

- None

#### References

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"  
- 20M-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "  
- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"  
- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

#### Open Items and VFDRs

VFDR Number	BV2-0406	CO2 Fire Suppression System Lacks Local Isolation Valves
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The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:

NA

#### **Disposition**

This VFDR will be corrected by a plant modification.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-DG-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The possibility of secondary thermal shock (cooling) damage is considered credible only to electrical components and cable. Cable trays are located approximately 8 feet below the nozzles. Due to the geometry of the area, there are locations where there is nothing of significance close to the CO2 nozzles and locations where trays are in relatively close proximity to the nozzles. A number of cable trays in this area are covered, further shielding those cables from the impingement and thermal effects of a CO2 discharge. Electrical equipment is located closer to the floor below the cable trays. Adequate spacing between the CO2 nozzles and adjacent equipment provides reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RE-0034AU, Rev. 8, "Cable Tray Arrangement diesel Gen bldg"  
- 20ST-33.13S, Rev. 1, "South Diesel Zone 5 CO2 Puff Test"

- 10080-RM-0013A, Rev. 8, "Arrangement Diesel Gen Bldg"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-DG-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Based on NFPA 12 and the Fire Protection Handbook, carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. The corrosive characteristics of agent decomposition products are expected to be of very minor concern and acceptable.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"

- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

All barriers associated with fire compartment 2-DG-1 that are relied upon to separate this compartment from adjacent fire compartments are rated for 3 hr. The exterior walls and the interior wall separating 2-DG-1 from 2-DG-2 are 2 ft. thick concrete. The fire barriers of this fire compartment are inspected by procedure. Penetrations of exterior and interior walls forming the fire barriers are sealed with a material having a rating equivalent to the barrier rating except for the intake and exhaust openings which are separated by sufficient distance to preclude the possibility of fire propagation.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RB-0007A, Rev. 6, "Building Services Diesel Generator Bldg"  
- 10080-RB-0007C, Rev. 9, "Building Services Diesel Generator Building"  
- 10080-RB-0007E, Rev. 5, "Building Services Diesel Gen Building"  
- 10080-RB-0007G, Rev. 5, "Ventilation Diesel Gen Building"  
- 10080-RC-0029B, Rev. 6, "Plan EI 759 6 Diesel Gen Bldg"  
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-RB-0007B, Rev. 8, "Building Services Diesel Generator Bldg"  
- 10080-RB-0007D, Rev. 9, "Building Services Diesel Gen building"  
- 10080-RB-0007F, Rev. 5, "Ventilation Diesel Generator Bldg"  
- 10080-RC-0029A, Rev. 7, "Plan-EI 732-6 Outline Diesel Gen Bldg"  
- 10080-RC-0029C, Rev. 6, "Plan 775 & 789 Diesel Gen Bldg"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Dampers: Complies

There are no HVAC duct penetrations in the barrier between fire compartments.

Fire Doors: Complies

Fire doors are 3 hr fire rated and separate 2-DG-1 from adjacent fire compartments. Doors are inspected by procedure.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10ST-33.5, Rev. 19, "Fire Protection System Inspection Test"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"  
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-1**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RE-0037BJ, Rev. 8, "Concealed Conduit & Sleeves Diesel Gen Bldg"
- 10080-RE-32N, Rev. 9, "MANHOLES & DUCTLINE"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037BT, Rev. 4, "Concealed Conduit & Sleeves Vital Area Doors"
- 10080-RP-0068C, Rev. 9, "Sleeve Loc Misc"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-2**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The following critical attributes of the consensus code were evaluated to ensure functionality and reliability:

1.   A 34% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 34% is achieved.
2.   A 34% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 34% is achieved.
3.   The CO2 will discharge after a pre-discharge time delay during which alarm horns and revolving red lights warn any personnel in the area to evacuate.
4.   Heat detectors are available in the fire compartment and will actuate the CO2 system if alarmed. This area is equipped with local alarms and alarms in the main control room.
5.   CO2 system is outfitted with a manual discharge station which is tested by procedure.
6.   This CO2 area requires dampers which are motor operated.
7.   Level and Pressure alarms of the storage tanks are available in the control room.
8.   Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9.   A procedure tests the pre-discharge time on a periodic basis.
10.   This CO2 area requires dampers which are motor operated.
11.   An overpressure relief path is not applicable in this area.
12.   The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

13. A compensatory action plan is required to be established if the system becomes inoperable.

Complies by Previous Approval

10. All doors to this compartment are fire-rated doors and are normally closed. There are unsupervised fire doors in 2-DG-2, which is documented as an accepted deviation in the SSER.

Complies with Clarification

10. The room exhaust fans trip off on an independent circuit.

Will Comply with the Use of Commitment

10. Procedural changes to pre-fire plans are being implemented to confirm the room exhaust ventilation fan is shut off, and, if necessary, discharge a second shot of CO2 into the space.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"  
 - 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"  
 - 10080-RE-0034AU, Rev. 8, "Cable Tray Arrangement diesel Gen bldg"  
 - 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"  
 - 10080-TLD-33A-027-02, Rev. 5, "TLD FP CO2 Zone 6"  
 - 10080-TLD-33A-027-04, Rev. 5, "TLD FP CO2 Zone 6"  
 - 10080-TLD-33A-028-02, Rev. 6, "TLD FP CO2 Zone 6"  
 - 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"  
 - 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "  
 - 2OST-33.13T, Rev. 1, "North Diesel (Zone 6) CO2 Puff Test"  
 - 2PFP-DGBX-732-DG-2, Rev. 3, "DIESEL GENERATOR 2-2 ROOM FIRE AREA DG-2"

**Supporting EEEEs**

- None

- 10080-LSK-20-2F, Rev. 10, "Logic Diagram CO2 FP system"  
 - 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"  
 - 10080-RM-0013A, Rev. 8, "Arrangement Diesel Gen Bldg"  
 - 10080-TLD-33A-027-01, Rev. 5, "TLD FP CO2 Zone 6"  
 - 10080-TLD-33A-027-03, Rev. 6, "TLD FP CO2 Zone 6"  
 - 10080-TLD-33A-028-01, Rev. 6, "TLD-FP CO2 Zone 6"  
 - 2710.180-174-042, Rev. A, "CALC CO2 SYSTEM 2 ZONE 6 DIESEL GENERATOR BUILDING"  
 - 2DBD-33B, Rev. 10, "Fire Protection System"  
 - 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"  
 - 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"  
 - 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Open Items and VFDRs**

<b>Item Number</b>	BV2-1022	<b>Item Title:</b> Perform Procedural Enhancements to Pre-fire Plans for 2-DG-1, 2-DG-2 Control Circuits Vent Fans
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

Local status lights are provided on 2FPD-CONTPNL2-6 (El. 732) for the 2-DG-2 CO2 system, as well as annunciation in the main control room and input to the plant computer. Control room alarms are Annunciator window A11-1E for fire detection alarm, Annunciator window A11-2E for CO2 system discharge, and Annunciator window A11-3E for CO2 system trouble.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"

- 10080-TLD-33A-028-01, Rev. 6, "TLD-FP CO2 Zone 6"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-2**

**Compliance Statement:**   Complies  
                                     Complies with Clarification  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

Complies

The BVPS-2 CO2 system was placed into automatic operation after all of the acceptance tests were successfully performed. This included full CO2 system discharge and observation of the integrity of the area boundary components. It was then determined that adequate relief openings existed in the boundary openings to the outside from the fire compartment.

This fire compartment is not located within the radiologically controlled area. There are no radiological considerations for fire compartment 2-DG-2.

Complies with Clarification

The room exhaust fans trip off on an independent circuit.

Will Comply with the Use of a Commitment

Procedural changes to pre-fire plans are being implemented to confirm the room exhaust ventilation fan is shut off, and, if necessary, discharge a second shot of CO2 into the space.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 20ST-33.13T, Rev. 1, "North Diesel (Zone 6) CO2 Puff Test"

- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"

- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

- 2PFP-DGBX-732-DG-2, Rev. 3, "DIESEL GENERATOR 2-2 ROOM FIRE AREA DG-2"

- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

<b>Item Number</b>	<b>Item Title:</b>
BV2-1022	Perform Procedural Enhancements to Pre-fire Plans for 2-DG-1, 2-DG-2 Control Circuits Vent Fans

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

Beaver Valley Unit 2

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Fire Compartment -** 2-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone which can be used to prevent the discharge of CO2 when workers are in that zone. The key lock is under strict administrative control.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 20M-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 20ST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"  
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.6 - Occupied areas

**Compliance Basis:**

Access to 2-DG-2 is through security doors accessed by card-reader. This ensures that entry to the area is only to perform a specific task in the area and for no other reason. The area is not normally occupied.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The system is also provided with an odorizer.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-LSK-20-2F, Rev. 10, "Logic Diagram CO2 FP system"
- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 10080-TLD-33A-027-02, Rev. 5, "TLD FP CO2 Zone 6"
- 10080-TLD-33A-027-04, Rev. 5, "TLD FP CO2 Zone 6"
- 10080-TLD-33A-028-02, Rev. 6, "TLD FP CO2 Zone 6"

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 10080-TLD-33A-027-01, Rev. 5, "TLD FP CO2 Zone 6"
- 10080-TLD-33A-027-03, Rev. 6, "TLD FP CO2 Zone 6"
- 10080-TLD-33A-028-01, Rev. 6, "TLD-FP CO2 Zone 6"
- 2OST-33.13T, Rev. 1, "North Diesel (Zone 6) CO2 Puff Test"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-DG-2

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"  
- ZOM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "  
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"  
- ZOM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

**Open Items and VFDRs**

<b>VFDR Number</b>	BV2-0406	CO2 Fire Suppression System Lacks Local Isolation Valves
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The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The possibility of secondary thermal shock (cooling) damage is considered credible only to electrical components and cable. Cable trays are located approximately 8 feet below the nozzles. Due to the geometry of the area, there are locations where there is nothing of significance close to the CO2 nozzles and locations where trays are in relatively close proximity to the nozzles. A number of cable trays in this area are covered, further shielding those cables from the impingement and thermal effects of a CO2 discharge. Electrical equipment is located closer to the floor below the cable trays. Adequate spacing between the CO2 nozzles and adjacent equipment provides reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RE-0034AU, Rev. 8, "Cable Tray Arrangement diesel Gen bldg"  
- 2OST-33.13T, Rev. 1, "North Diesel (Zone 6) CO2 Puff Test"

- 10080-RM-0013A, Rev. 8, "Arrangement Diesel Gen Bldg"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

**Compliance Basis:**

Based on NFPA 12 and the Fire Protection Handbook, carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. The corrosive characteristics of agent decomposition products are expected to be of very minor concern and acceptable.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- "Fire Protection Handbook, Sixteenth Edition"

- NFPA 12, "Carbon Dioxide Extinguishing Systems 1973"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-DG-2

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

All barriers associated with fire compartment 2-DG-2 that are relied upon to separate this compartment from adjacent fire compartments are rated for 3 hr. The exterior walls and the interior wall separating 2-DG-1 from 2-DG-2 are 2 ft. thick concrete. The fire barriers of this fire compartment are inspected by procedure. Penetrations of exterior and interior walls forming the fire barriers are sealed with a material having a rating equivalent to the barrier rating except for the intake and exhaust openings which are separated by sufficient distance to preclude the possibility of fire propagation.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-RB-0007A, Rev. 6, "Building Services Diesel Generator Bldg"  
- 10080-RB-0007C, Rev. 9, "Building Services Diesel Generator Building"  
- 10080-RB-0007E, Rev. 5, "Building Services Diesel Gen Building"  
- 10080-RB-0007G, Rev. 5, "Ventilation Diesel Gen Building"  
- 10080-RC-0029B, Rev. 6, "Plan El 759 6 Diesel Gen Bldg"  
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-RB-0007B, Rev. 8, "Building Services Diesel Generator Bldg"  
- 10080-RB-0007D, Rev. 9, "Building Services Diesel Gen building"  
- 10080-RB-0007F, Rev. 5, "Ventilation Diesel Generator Bldg"  
- 10080-RC-0029A, Rev. 7, "Plan-El 732-6 Outline Diesel Gen Bldg"  
- 10080-RC-0029C, Rev. 6, "Plan 775 & 789 Diesel Gen Bldg"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-DG-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Dampers: Complies

There are no HVAC duct penetrations in the barrier between fire compartments.

Fire Doors: Complies

Fire doors are 3 hr fire rated and separate 2-DG-2 from adjacent fire compartments. Doors are inspected by procedure.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 20ST-33.5, Rev. 18, "Fire Protection System Inspection Test"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-RA-0006B, Rev. 21, "Door Schedule & Details"  
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-DG-2

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 10080-RE-0037BJ, Rev. 8, "Concealed Conduit & Sleeves Diesel Gen Bldg"  
- 10080-RE-32N, Rev. 9, "MANHOLES & DUCTLINE"  
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"  
- 10080-RE-0037BT, Rev. 4, "Concealed Conduit & Sleeves Vital Area Doors"  
- 10080-RP-0068C, Rev. 9, "Sleeve Loc Misc"  
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"  
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-FB-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Drawings show the boundaries of fire compartment 2-FB-1 as 3 hr. fire barriers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"
- 10080-RM-0301E, Rev. 12, "Hazard Boundaries EL 774 - 7"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EL 760 7"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-FB-1

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

The following deviations from BTP CMEB 9.5-1 are related to 2-FB-1: C.5.a(4) Modified fire dampers two 1-1/2-hour fire dampers in series and fire damper installed outside of fire wall with 1-hour fire wrap; C.5.a(5) Modified fire doors. Their acceptance is documented in NRC SSER 5 dated May 1987.

Fire Dampers:

Duct penetrations are provided with two 1 1/2 - hour fire-rated dampers 2HVS-DMPF201 & 204 in series based on drawings and are inspected by procedure. The SSERs concluded the dampers in series are an acceptable deviation.

Fire Doors:

Fire doors are 3-hour fire rated and are inspected by procedure. The SSER concluded the security modifications are an acceptable deviation.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"
- 10080-RC-0038A, Rev. 10, "Fuel and Decon Bldg Found Plan"
- 87-05-05, "BV2 SSER "
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RB-0067A, Rev. 11, "VENT WSTE HAND BLDG"
- 10080-RC-0038B, Rev. 8, "Fuel & Decon Bldg. Plan 768'-4" & Below"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

- None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-FB-1**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- FPPCE 12-088 Rev.0

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RE-0032F, Rev. 11, "Ductline pln and detail"
- 10080-RM-0007B, Rev. 11, "FUEL AND DECON BLDG"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037X, Rev. 13, "CND & SLV FUEL & DECON BLDG"
- 10080-RP-0117N, Rev. 4, "SLV LOC FUEL DECON BLDG"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-MS-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The walls and floor have a fire rating of 3 hours, which exceeds that required by the fire analysis. All penetrations of the concrete walls and floor to adjacent fire areas have been sealed with a material having a rating equivalent to the barrier rating with the exception of the ceiling, which goes out to the roof area where combustibles or fire hazards would not be present. The fire barriers of this fire compartment are inspected by procedure.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

**Supporting EEEEs**

- None

**References**

- 10080-RM-0301E, Rev. 12, "Hazard Boundaries El. 774 - 7"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"  
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"  
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-MS-1**

**Compliance Statement:**   Complies  
                                      Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Fire Doors:

The doors associated with 2-MS-1 that separate it from adjacent compartments are 3 hr fire rated.

Complies by Previous Approval

Fire Dampers:

The following deviation from BTP CMEB 9.5-1 is related to 2-MS-1: C.5.a(4) Modified fire dampers, two 1 1/2-hour fire dampers in series with acceptance documented in NRC SSER 5.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

**Supporting EEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"  
  
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"  
  
- 10080-RC-0031G, Rev. 11, "MS & CV Slab Plan 773'-6"

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"  
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"  
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-MS-1**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009F, Rev. 5, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037BZ, Rev. 12, "Cnd & Slv CV"
- 10080-RP-0116M, Rev. 9, "Slv MS 773"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037BY, Rev. 7, "Slv Design Rod Cntl Bldg"
- 10080-RE-0037G, Rev. 19, "CONDUIT & SLV ROD CNTL BLDG"
- 10080-RP-0116N, Rev. 2, "SLV LOC MS"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3**

**Compliance Statement:**   Complies  
                                      Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

Complies

Items 1 through 10 comply with the exception of item 3.

1.   Verified spot type heat and smoke detectors located on ceiling. Zone 49 has 31 ionization detectors (DI369-394; DI575, 576, 590, 591 & 603). Zone 51 has 34 ionization detectors (DI400-431, DI569 & 570).
2.   Verified there are no significant platforms in the area as defined by NFPA-72E, paragraph 2-6.6.
4.   Verified detectors periodically tested by procedure on an annual basis.
5.   Verified there are no duct detectors.
6.   Verified there are no detectors used for releasing fire doors.
7.   Verified each zone of detectors send fire alarm to main control room upon actuation of detector(s), and trouble alarm upon fault in the detector circuit. Detectors are tested annually by procedure. The test verifies a control room alarm is received for each smoke detector; the supervised circuits generate an alarm while in the trouble condition, audible alarms actuate and detectors are operable thru the use of a test gas and trouble alarm upon fault in the detector circuit.
8.   Verified that all circuits required for fire detection alarms are electrically supervised in accordance with NFPA 72D with trouble alarms back to main control room.
9.   Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10.   Confirmed that the compensatory measure is appropriate for the level of importance of this system. Procedure lists the minimum operable detectors for PA-3. Zone 49 and 51 are divided into zones 'A' and 'B'. Zone 49 requires sixteen out of 31 and zone 51 requires eighteen out of 34 detectors to be operable. The compensatory measure is to establish an hourly fire watch within one hour and restore to operable status within 14 days.

Complies with Clarification

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

3. The Auxiliary Building basement floor on elevation 710' 6" as well as the individual cubicles and pipe vault on the west side of 2-PA-3 do not contain or present a fire hazard. For this reason fire detection was not provided in this portion of 2-PA-3. The PRA for this Fire Compartment also used the partial area coverage as installed. The PRA conclusion given the partial area detection coverage for 2-PA-3, along with the DFM and PRA, is that the current fire detection system is acceptable.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0036B, Sht. 2, Rev. 15, "Plans Auxiliary Building"
- 10080-RC-0036B, Rev. 10, "PLAN EL 735 & 755 AUX BLDG"
- 10080-RE-0064B, Rev. 5, "AB Det Conduit pln 710 718"
- 10080-TLD-033D-049-01, Rev. 5, "Zone 49 AB Smoke Det"
- 10080-TLD-033D-049-03, Rev. 5, "Zone 49 AB Smoke Det"
- 10080-TLD-033D-049-05, Rev. 5, "Zone 49 AB Smoke Det"
- 10080-TLD-033D-051-02, Rev. 5, "ZONE 51 AB SMOKE DET"
- 10080-TLD-033D-051-04, Rev. 5, "FD ZONE 51 Aux Bldg Smoke Det"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- TER-012608 R0

- 10080-RA-0036A, Sht. 1, Rev. 16, "Plans Auxiliary Building"
- 10080-RA-0036F, Rev. 10, "Plan Floor 718' & 710' Aux Bldg"
- 10080-RC-0036D, Rev. 6, "PLAN 735 AUX BLDG"
- 10080-RE-0064C, Rev. 6, "CND PLN FD AUX BLDG 735 & 755"
- 10080-TLD-033D-049-02, Rev. 5, "Zone 49 AB Smoke Det"
- 10080-TLD-033D-049-04, Rev. 5, "Zone 49 AB smoke Det"
- 10080-TLD-033D-051-01, Rev. 5, "Zone 51 AB Smoke Det"
- 10080-TLD-033D-051-03, Rev. 5, "ZONE 51 AB SMOKE DET"
- 20ST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3**

**Compliance Statement:**   Complies  
                                      Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:**     3.9.1 - NFPA Standards

**Compliance Basis:**

Fire Compartment 2-PA-3 has a only a preaction spray system located over the component cooling pumps (CCPs) activated by heat detectors and the pipe is air supervised for reliability. This partial area suppression system was evaluated as acceptable by the PRA and in the FRE and MCA evaluations.

Complies

3.   Piping and fittings are designed for a working pressure of 175 psig cold water working pressure.
4.   Piping and fittings are galvanized or otherwise protected from corrosion.
6.   A main pipeline strainer is installed on the water-based suppression line for this location.
7.   Nozzle passageways are greater than 1/8 inch, therefore individual nozzle strainers are not required.
8.   Successful activation of the system provides waterflow in pipes and cooling to the gasketed fittings preventing burn, while active water-suppression of the hazard takes place.
10.   Circuits required for fire detection alarm are electrically supervised with trouble alarms back to main control room.
11.   Control panels needed for system actuation or alarm are provided with primary and secondary power sources.
12.   There are appropriate compensatory measures established in procedures if the water-based suppression system or the notifying system becomes non-functional.

Complies with the Use of Commitment

1.   Review/confirm hydraulic calculations including discharge of all systems designed to operate simultaneously and with required fire hose streams.
  - Hydraulic calculations for this system require additional verification. See Attachment S for details.
2.   The water spray density for this system is indicated as between 0.2 and 0.5 gpm/sq.ft. and in accordance with the NFPA 15 Chapter 4.

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features Transition Report

**Beaver Valley Unit 2**

#### **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

- This will be verified pending the hydraulic calculations for this system. See Attachment S for details.
5. Review/confirm spray nozzles are of approved makes and types (para. 2041).
- Additional documentation is needed to confirm the make and type of nozzles. See Attachment S for details.
9. The heat detection system is designed to cause actuation of the control valve within 30 seconds under the expected fire conditions.
- The procedures will be updated to include heat detection activation time in accordance with NFPA 15. See Attachment S for details.

#### **Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

#### **Supporting EEEEs**

- None

#### **References**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>- 1/2-PIP-M14, Rev. 10, "Pipe Classes For Use On BV-1 And BV-2"</li> <li>- 10080-RM-0433-001C, Rev. 19, "Valve Oper No Diagram Fire Protection Water - Aux Bldg"</li> <li>- 10080-TLD-033D-049-02, Rev. 5, "Zone 49 AB Smoke Det"</li> <li>- 10080-TLD-033D-049-04, Rev. 5, "Zone 49 AB smoke Det"</li> <li>- 10080-TLD-033D-051-01, Rev. 5, "Zone 51 AB Smoke Det"</li> <li>- 10080-TLD-033D-051-03, Rev. 5, "ZONE 51 AB SMOKE DET"</li> <li>- 2010.180-173-035D, Rev. 3, "Auxiliary Bldg Elev. 735'6" Component Cooling Pumps"</li> <li>- 2DBD-33B, Rev. 10, "Fire Protection System"</li> <li>- 2OST-33.3, Rev. 15, "Fire Protection System Drain Test"</li> <li>- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"</li> </ul> | <ul style="list-style-type: none"> <li>- 10080-E-10L, Rev. 21, "Window Arrangement - Annunciator A10"</li> <li>- 10080-TLD-033D-049-01, Rev. 5, "Zone 49 AB Smoke Det"</li> <li>- 10080-TLD-033D-049-03, Rev. 5, "Zone 49 AB Smoke Det"</li> <li>- 10080-TLD-033D-049-05, Rev. 5, "Zone 49 AB Smoke Det"</li> <li>- 10080-TLD-033D-051-02, Rev. 5, "ZONE 51 AB SMOKE DET"</li> <li>- 10080-TLD-033D-051-04, Rev. 5, "FD ZONE 51 Aux Bldg Smoke Det"</li> <li>- 2BVS-173, Rev. 5, "Sprinkler and Water Spray Fire Protection Systems"</li> <li>- 2OST-33.13I, Rev. 11, "Water Suppression System Heat Detector Test"</li> <li>- 2OST-33.3A, Rev. 5, "FP System Supv Circuit Test"</li> <li>- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"</li> </ul> |
|---|--|

#### **Open Items and VFDRs**

<b>Item Number</b>	BV2-1314	<b>Item Title:</b> BV2 Procedure Update 2OST-33.13I
<b>Item Number</b>	BV2-1369	<b>Item Title:</b> BV2 Hydraulic Calculations



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-PA-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.2 - Water Flow Alarm

**Compliance Basis:**

The water-spray system for this area is provided with water flow alarm device on its deluge valve that sends its alarm signal to the local and main control room alarm panels.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 10080-E-10L, Rev. 21, "Window Arrangement - Annunciator A10"  
- 20M-33.1.E, Rev. 10, "Specific Instrument and Control"  
- 20ST-33.3, Rev. 15, "Fire Protection System Drain Test"

- 10080-RM-433-1C, Rev. 19, "Valve Oper No Diagram Fire Protection Water-Aux Bldg"  
- 20ST-33.13I, Rev. 11, "Water Suppression System Heat Detector Test"  
- 20ST-33.3A, Rev. 5, "FP System Supv Circuit Test"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.3 - Suppression system annunciation

**Compliance Basis:**

Alarms associated with the deluge valve for this area annunciate in the control room.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 10080-E-10L, Rev. 21, "Window Arrangement - Annunciator A10"  
  
- 10080-RM-433-1C, Rev. 19, "Valve Oper No Diagram Fire Protection  
Water-Aux Bldg"  
- 2OST-33.13I, Rev. 11, "Water Suppression System Heat Detector Test"  
- 2OST-33.3A, Rev. 5, "FP System Supv Circuit Test"

- 10080-RM-0433-001A, Rev. 22, "Valve Oper No Diagram Fire Prot  
Wtr-Distribution Network"  
- 2OM-33.1.E, Rev. 10, "Specific Instrument and Control"  
  
- 2OST-33.3, Rev. 15, "Fire Protection System Drain Test"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.5 - OS&Y gate valve

**Compliance Basis:**

An OS&Y gate valve provides shutoff for the water spray system for this compartment.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 10080-RM-0433-001A, Rev. 22, "Valve Oper No Diagram Fire Prot  
Wtr-Distribution Network"

- 20ST-33.13I, Rev. 11, "Water Suppression System Heat Detector Test"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-PA-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.6 - Valve Performance

**Compliance Basis:**

The water spray system in this compartment is provided with an individual isolation valve, having a limit switch with valve position supervision circuit that provides a local trouble light and annunciator signals in the main control room.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 10080-E-10L, Rev. 21, "Window Arrangement - Annunciator A10"  
  
- 10080-RM-433-1C, Rev. 19, "Valve Oper No Diagram Fire Protection Water-Aux Bldg"  
- 20ST-33.3, Rev. 15, "Fire Protection System Drain Test"

- 10080-RM-0433-001A, Rev. 22, "Valve Oper No Diagram Fire Prot Wtr-Distribution Network"  
- 20ST-33.13I, Rev. 11, "Water Suppression System Heat Detector Test"  
- 20ST-33.3A, Rev. 5, "FP System Supv Circuit Test"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**Beaver Valley Unit 2**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Fire Compartment - 2-PA-3**

**Compliance Statement:**   Complies by Previous Approval  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

The boundaries of fire compartment 2-PA-3 are 3 hr fire rated based on drawings except as discussed in the following:

Complies by Previous Approval

The following deviations from BTP CMEB 9.5-1 are related to 2-PA-3: C.5.b 3-hour barriers between redundant components (Charging pumps, component cooling water pumps, charging pump suction source isolation valves; C.5.a(4) Modified fire dampers two 1-1/2-hour fire dampers in series and fire damper installed outside of fire wall with 1-hour fire wrap; C.5.a(5) Modified fire doors. Their acceptance is documented in NRC SSER 5 dated May 1987.

Complies with use of EEEE

An evaluation (10080-DMC-0699) has been performed in accordance with Generic Letter 86-10 for non-fire rated ventilation ductwork penetrations between Fire Areas 2-PA-3 and 2-PA-4 (Degassifier and Gaseous Waste charcoal Bed Cubicles). Also, DEC-0190 performs an evaluation to determine the ability of the installed Thermo-Lag fire barrier configurations to have a 3 hour fire rating for the Removable Floor Plugs and structural steel fire proofing on the Fire Wall between Auxiliary Building (Fire Area 2-PA-3) and Condensate Polishing Building (Fire Area 2-CP-1).

Evaluation TER-012608 provides unique identifiers to seismic shake space seals that require inspection and provides a basis for excluding, where applicable, those shake space seal locations from having a fire rated seal.

Evaluation DEC-0184 evaluates the acceptability of 3M Interam E-50 series blanket assemblies that provide a one hour fire resistance for the ductwork use during a fire for ventilation and a 2 hour fire resistance for the protection of the 1-1/2 hour fire dampers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)
- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

10080-DEC-0184 R1 A0  
10080-DMC-0699 R0 A0  
TER-012608 R0

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- |   |  |
|---|--|
| - 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"              | - 10080-RM-0301A, Rev. 6, "Hazard Boundaries"                          |
| - 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"       | - 10080-RM-0301D, Rev. 15, "Hazard Boundaries El 760 7"                |
| - 10080-RM-0301E, Rev. 12, "Hazard Boundaries El. 774 - 7"      | - 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"        |
| - 87-05-05, "BV2 SSER "   | - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report" |
| - FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report" |  |

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3**

**Compliance Statement:**   Complies by Previous Approval  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies by Prior Approval

Fire Dampers & Fire Doors:

The following are deviations from BTP CMEB 9.5-1 related to PA-3: C.5.b 3-hour barriers between redundant components (Charging pumps, component cooling water pumps, charging pump suction source isolation valves; C.5.a(4) Modified fire dampers two 1-1/2-hour fire dampers in series and fire damper installed outside of fire wall with 1-hour fire wrap; C.5.a(5) Modified fire doors. Their acceptance is documented in NRC SSER 5.

Complies with use of EEEE

FPPCE 13-030 concludes the horizontal sliding door overlap is acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)
- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RB-0044B, Rev. 8, "VENT ARRANG AUX BLDG"
- 87-05-05, "BV2 SSER "

**Supporting EEEEs**

FPPCE 13-030 Rev.0

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"
- 2OST-33.5, Rev. 18, "Fire Protection System Inspection Test"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-PA-3

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)
- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037BH, Rev. 11, "SLV AUX BLDG"
- 10080-RE-0037M, Rev. 12, "conduit and sleeve cable tunnel"
- 10080-RE-0048AC, Rev. 4, "CND PL AB"
- 10080-RP-0117A, Rev. 7, "SLV LOC AB 710"
- 10080-RP-0117E, Rev. 8, "SLV LOC AUX BLDG"
- 10080-RP-0117H, Rev. 8, "SLV LOC AB"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Supporting EEEEs**

- 10080-DEC-0188 R0 A0
- 10080-DEC-0190 R1 A0
- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037BD, Rev. 10, "SLV AB"
- 10080-RE-0037D, Sht. 1, Rev. 21, "Concealed Conduit & Sleeves Aux Bldg"
- 10080-RE-0037Z, Rev. 15, "COND SLV AB"
- 10080-RE-0057F, Rev. 6, "COND PLN AB EL 710"
- 10080-RP-0117C, Rev. 9, "SLV LOC AB 718 - 726"
- 10080-RP-0117F, Rev. 8, "SLV LOC AB 735"
- 10080-RP-0117J, Rev. 7, "SLV LOC AB 773"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:**     3.11.5 - ERFBS

**Compliance Basis:**

Fire Compartment 2-PA-3 consists of at el. 710'-6", 718'-6" and 735'-6" of the primary auxiliary building and the degasifiers cubicle on el. 755'-6". Section 3.16.6 of the FPSSR lists various cables and raceways that are routed through PA-3 and are required to be fire wrapped. ERFBS in compartment PA-3 for conduits and cable trays consist of TSI thermo-Lag and 3M Interam wrap used to protect electrical power and control cables for systems and components used for achieving and maintaining safe shutdown conditions.

Procedure verify on an 18 month frequency, by visual inspection that the exposed surfaces of all fire rated assemblies i.e. fire wrapped conduit, cable trays, ductwork and cable are in operable condition. Fire wraps with indications of degradation are entered into the Corrective Action Program with the applicable compensatory measure implemented by procedure.

Complies

The 3M Interam E 50 series one-hour fire wrap installed on cable trays, conduit and air drops is bound by fire tests. The 3M material was installed in accordance with the manufacturer's installation manuals and the Sergeant Electric installation details for 3M.

Complies with the use of Evaluations

BV-2 through a series of evaluations concluded Thermo-Lag panels and conduit sections having 0.50 inch nominal thickness with pre-buttered or post-buttered joint construction were upgraded to be equivalent to a 1-hour fire rating by achieving a 1 inch thickness.

The 3M Interam E-50 series blanket assemblies was evaluated to provide a one hour fire resistance for the ductwork and a 2 hour fire resistance for protection of the 1-1/2 hour fire dampers.

**Licensing Actions**

- None

**Supporting EEEEs**

10080-DEC-0184 R1 A0  
10080-DEC-0190 R1 A0  
10080-DEC-0191 R0 A0  
12241-B-239 Rev. 0

**References**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 10080-DEC-0184, Rev. 1, "Engineering Evaluation of Thermolag Deviations from Installation Procedures"
- 10080-DEC-0191, Rev. 0, "Thermo-Lag Conduit Eval."
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-DEC-0190, Rev. 1, "Thermo-Lag JB Misc Design"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-PA-3A

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Complies by Previous Approval

Charging Pump Cubicle 2-PA-3A is an individual cubicle with 2-ft-thick reinforced concrete side walls. The following deviation from BTP CMEB 9.5-1 related to charging pump cubicle: C.5.b 3-hour barriers between redundant components (Charging pumps, component cooling water pumps, charging pump suction source isolation valves). Their acceptance is documented in NRC SSER 5 dated May 1987. The 2-ft-thick removable concrete back wall with a small opening at the top for the crane access rail to pass through. The back wall consists of removable block to facilitate removal of a charging pump for maintenance. The east wall of each cubicle is a 2-ft-thick concrete wall and has a labyrinth-type opening for radiation protection. This opening provides ventilation to the charging pump.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEs**

- None

**References**

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 87-05-05, "BV2 SSER "  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-PA-3A

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

The following deviation from BTP CMEB 9.5-1 is related to the charging pump cubicle: C.5.b 3-hour barriers between redundant components (Charging pumps, component cooling water pumps, charging pump suction source isolation valves. Their acceptance is documented in NRC SSER 5 dated May 1987.

Fire Dampers:

There is a HVAC duct penetration in the barrier between 2-PA-3A and adjacent fire compartment. A single damper, 2HVP\*DMPF202 rated at 1 ½ hour fire rating, is installed in the barrier. Duct penetration for the charging pump cubicle is provided with one 1 1/2 – hour fire-rated damper based on drawings.

Fire Doors:

There are no fire doors associated with fire compartment 2-PA-3A.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
  
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"  
  
- 87-05-05, "BV2 SSER "

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper  
Maintenance and Trip Check"  
- 10080-RB-0044B, Rev. 8, "VENT ARRANG AUX BLDG"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3A**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Evaluation determined the need for fireproofing the supplementary structural steel associated with oversize blockouts in 3 hour fire rated barriers. Oversized blockouts have penetration seals that have supplementary structural steel. The supplementary structural steel consists of angle iron and 'C' channel running across the top and bottom of the seal parallel to the shortest side of the blockout and extended past the blockout onto the concrete floor or connects into the concrete wall. The penetration seal is only required to support its own weight and no other loads.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4  
8700-DMC-2840 Rev. 0 Eval #4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 10080-RE-0048AC, Rev. 4, "CND PL AB"  
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"  
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"  
- 10080-RP-0117F, Rev. 8, "SLV LOC AB 735"  
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"  
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-PA-3B

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Charging Pump Cubicle 2-PA-3B is an individual cubicle with 2-ft-thick reinforced concrete side walls. The following deviation from BTP CMEB 9.5-1 related to charging pump cubicle: C.5.b 3-hour barriers between redundant components (Charging pumps, component cooling water pumps, charging pump suction source isolation valves). Their acceptance is documented in NRC SSER 5 dated May 1987. The 2-ft-thick removable concrete back wall with a small opening at the top for the crane access rail to pass through. The back wall consists of removable block to facilitate removal of a charging pump for maintenance. The east wall of each cubicle is a 2-ft-thick concrete wall and has a labyrinth-type opening for radiation protection. This opening provides ventilation to the charging pump.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 87-05-05, "BV2 SSER "  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-PA-3B

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Dampers:

The following deviation from BTP CMEB 9.5-1 is related to the charging pump cubicle: C.5.b 3-hour barriers between redundant components (Charging pumps, component cooling water pumps, charging pump suction source isolation valves). Their acceptance is documented in NRC SSER 5 dated May 1987.

Fire Doors:

No fire doors exist for this fire compartment.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"  
- 87-05-05, "BV2 SSER "

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper  
Maintenance and Trip Check"  
- 10080-RB-0044B, Rev. 8, "VENT ARRANG AUX BLDG"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-PA-3B

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4  
8700-DMC-2840 Rev. 0 Eval #4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 10080-RE-0048AC, Rev. 4, "CND PL AB"  
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"  
- 10080-RP-0117F, Rev. 8, "SLV LOC AB 735"  
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"  
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-3C**

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Charging Pump Cubicle 2-PA-3C is an individual cubicle with 2-ft-thick reinforced concrete side walls. The following deviation from BTP CMEB 9.5-1 related to charging pump cubicle: C.5.b 3-hour barriers between redundant components (Charging pumps, component cooling water pumps, charging pump suction source isolation valves). Their acceptance is documented in NRC SSER 5 dated May 1987. The 2-ft-thick removable concrete back wall with a small opening at the top for the crane access rail to pass through. The back wall consists of removable block to facilitate removal of a charging pump for maintenance. The east wall of each cubicle is a 2-ft-thick concrete wall and has a labyrinth-type opening for radiation protection. This opening provides ventilation to the charging pump.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 87-05-05, "BV2 SSER "  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-PA-3C

**Compliance Statement:** Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Dampers:

There is a HVAC duct penetration in the barrier between 2-PA-3C and adjacent fire compartment. Duct penetration for the charging pump cubicle is provided with one 1 ½ - hour fire-rated damper. The lack of second damper to provide a 3 hr. overall fire rating is bounded by the deviation documented in NRC SSER 5.

Fire Doors:

There are no fire doors associated with this compartment.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"  
- 87-05-05, "BV2 SSER "

**Supporting EEEEs**

- None

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"  
- 10080-RB-0044B, Rev. 8, "VENT ARRANG AUX BLDG"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-PA-3C

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs. In addition, the need for fireproofing the supplementary structural steel associated with oversize blockouts in 3 hour fire rated floors has been performed and found not to be required.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4  
8700-DMC-2840 Rev. 0 Eval #4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 10080-RE-0048AC, Rev. 4, "CND PL AB"  
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"  
- 10080-RP-0117F, Rev. 8, "SLV LOC AB 735"  
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"  
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-4**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

Fire Compartment 2-PA-4 consists of the Auxiliary Building General Area, 755'-6".

The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed smoke detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the smoke detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEs**

10080-DMC-0054 Rev.2 A4

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and  
Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10080-RC-0036B, Rev. 10, "PLAN EL 735 & 755 AUX BLDG"  
- 10080-RE-0064C, Rev. 6, "CND PLN FD AUX BLDG 735 & 755"  
- 10080-TLD-033D-054-02, Rev. 5, "FD ZONE 54 AB SD"  
- 10080-TLD-033D-056-01, Rev. 4, "ZONE 56 AB SD"  
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation  
Test"

**Supporting EEEEs**

- 10080-RA-0036A, Sht. 1, Rev. 16, "Plans Auxiliary Building"  
- 10080-RC-0036D, Rev. 6, "PLAN 735 AUX BLDG"  
- 10080-TLD-033D-054-01, Rev. 5, "FD ZONE 54 AB SD"  
- 10080-TLD-033D-054-04, Rev. 5, "FD System Zone 54 Aux Bldg Smoke  
Det"  
- 10080-TLD-033D-056-02, Rev. 4, "ZONE 56 AB SD"  
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-4**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The walls, ceiling, and floor have a fire rating of 3 hours, which exceeds the required rating except as noted below. Within 2-PA-4 are two motor control center rooms which are separated by 3-hour fire-rated barriers; (Fire Areas 2-PA-6 and 2-PA-7) which are discussed as separate fire compartments.

Complies with use of EEEE

An evaluation (10080-DMC-0699) has been performed in accordance with Generic Letter 86-10 for non-fire rated ventilation ductwork penetrations between Fire Areas 2-PA-3 and 2-PA-4 (Degassifier and Gaseous Waste charcoal Bed Cubicles.)

Evaluation DEC-0184 evaluates 3M material is used to protect cable trays, conduit, air drop cables, ventilation ducts and dampers within air ducts. The purpose of this evaluation is to compare the installed configurations for 3M E-50 Series Interam fire wrap material to test configurations to demonstrate that the installed barrier provides a fire barrier equal to one hour when used to protect electrical cables and metal ducts and up to 2 hours when protecting fire dampers. The Interam material is wrapped round the item in successive layers with each layer over lapping itself. The final layer is taped down and provided with stainless steel support bands. In some cases the 3M wrap has a protective wire mesh installed over it to protect it from physical damage and is not part of the tested configuration.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0184, Rev. 1
- 10080-DMC-0699 R0 A0

**References**

- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EI 760 7"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 10080-RM-0301E, Rev. 12, "Hazard Boundaries EI. 774 - 7"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NEPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

Fire Compartment - 2-PA-4

**Compliance Statement:** Complies by Previous Approval

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

#### **Compliance Basis:**

Fire Dampers:

Duct penetrations are provided with two 1 1/2 - hour fire-rated dampers in series. The SSERs concluded the dampers in series are an acceptable deviation.

Fire Doors:

All doors are 3 hr fire rated per drawings. Doors are inspected by procedure. The SSERs concluded the security modifications are an acceptable deviation.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

- None

#### References

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RA-0036A, Sht. 1, Rev. 16, "Plans Auxiliary Building"
- 20ST-33.5, Rev. 18, "Fire Protection System Inspection Test"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"
- 87-05-05, "BV2 SSER "

#### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-4**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0188 R0 A0
- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037BH, Rev. 11, "SLV AUX BLDG"
- 10080-RE-0037E, Rev. 18, "COND SLV AB"
- 10080-RE-0048N, Rev. 9, "Conduit Pln AB 735"
- 10080-RP-0117G, Rev. 10, "SLEEVE AUX BLDG "
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037BD, Rev. 10, "SLV AB"
- 10080-RE-0037CK, Rev. 11, "COND AB ASP"
- 10080-RE-0037Z, Rev. 15, "COND SLV AB"
- 10080-RE-0048P, Rev. 13, "Conduit Pln AB 735"
- 10080-RP-0117H, Rev. 8, "SLV LOC AB"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-4**

**Compliance Statement:**   Complies  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** ERFBS

**SubSection:**     3.11.5 - ERFBS

**Compliance Basis:**

Fire Compartment 2-PA-4 consists of the Auxiliary Building General Area el. 755'-6". Section 3.16.6 of the FPSSR lists various cables and raceways that are routed through PA-4 and are required to be fire wrapped. ERFBS in compartment PA-4 for conduits and cable trays consist of TSI thermo-Lag and 3M Interam wrap used to protect electrical power and control cables for systems and components used for achieving and maintaining safe shutdown conditions.

Procedure verify on an 18 month frequency, by visual inspection that the exposed surfaces of all fire rated assemblies i.e. fire wrapped conduit, cable trays, ductwork and cable are in operable condition. Fire wraps with indications of degradation are entered into the Corrective Action Program with the applicable compensatory measure implemented by procedure.

Complies

The 3M Interam E 50 series one-hour fire wrap installed on cable trays, conduit and air drops is bound by fire tests. The 3M Interam E-50 series blanket assemblies provide a one hour fire resistance for the ductwork and a 2 hour fire resistance for protection of the 1-1/2 hour fire dampers. The 3M material was installed in accordance with the manufacturer's installation manuals and the Sergeant Electric installation details for 3M.

Complies by Previous Approval

PA-4 contains 30-inch wide cable trays. This exceeds the limit of six 24-inch wide trays as defined in BTP CMEB 95-1. Required safe shutdown cables are adequately protected in place by a fire wrap material. This deviation was accepted in BVPS-2 SER dated 10/85.

Complies with the use of Evaluations

BV-2 through a series of evaluations concluded Thermo-Lag panels and conduit sections having 0.50 inch nominal thickness with pre-buttered or post-buttered joint construction were upgraded to be equivalent to a 1-hour fire rating by achieving a 1 inch thickness.

**Licensing Actions**

- None

**Supporting EEEEs**

10080-DEC-0184 R1 A0  
10080-DEC-0190 R1 A0  
10080-DEC-0191 R0 A0

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- |   |   |
|---|---|
| - 1/2-ADM-1900, Rev. 28, "Fire Protection Program"              | - 10080-DEC-0184, Rev. 1, "3M Fire Wrap"                        |
| - 10080-DEC-0190, Rev. 1, "Thermo-Lag JB Misc Design"           | - 10080-DEC-0191, Rev. 0, "Thermo-Lag Conduit Eval."            |
| - 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection" | - FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report" |

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - 2-PA-5

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

#### **Compliance Basis:**

Fire Compartment PA-5 is provided with ionization smoke detectors. The following critical attributes of the smoke detection system were evaluated to ensure functionality and reliability in respect to NFPA 72E-1978 and NFPA 72D-1975.

1. Confirmed all detectors, with the exception of duct detectors, are located on the ceiling.
2. Confirmed there are no significant platforms.
3. Confirmed the current detector spacing is acceptable.
4. Confirmed detectors are tested annually by procedure.
5. Confirmed air duct detectors are provided as required by NFPA 90A.
6. Confirmed detectors are not used to release fire doors.
7. Confirmed that each zone of detectors send fire alarm to main control room upon actuation of detector(s), and trouble alarm upon fault in the detector circuit.
8. Confirmed that all circuits required for fire detection alarms are electrically supervised with trouble alarms back to main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. Confirmed procedure requires a minimum number of detectors be operable. The procedure also requires that a compensatory measure be implemented when two adjacent detectors in the same system are inoperable. For less than the required number of detectors operable a compensatory measure is required.

#### Licensing Actions

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

#### Supporting EEEEs

- None

#### References

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RE-0064AD, Rev. 4, "WD Fire Det 2DGP-4 Ser Bldg"
- 10080-TLD-033D-057-01, Rev. 5, "ZONE 57 AB SD"
- 10080-TLD-033D-057-03, Rev. 5, "TLD Station FD System Zone 57 Aux Bldg Smoke Det"
- 10080-TLD-033D-058-02, Rev. 4, "ZONE 58 AB SD"
- 87-05-05, "BV2 SSER "
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"
- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 10080-RA-0036B, Sht. 2, Rev. 15, "Plans Auxiliary Building"
- 10080-RE-0064D, Rev. 4, "CND Plan-Fire Detection Auxiliary Building - El. 773'-6"
- 10080-TLD-033D-057-02, Rev. 5, "ZONE 57 AB SD"
- 10080-TLD-033D-058-01, Rev. 4, "ZONE 58 AB SD"
- 20ST-33.16D, Rev. 0, "EARLY WARNING SMOKE DETECTION INSTRUMENTATION TEST AUX. BLDG AND MSCV BLDG"
- ARS-BV2-12-150, Rev. 0, "Early Warning and Actuation Fire Detection Spacing Report"
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-5**

**Compliance Statement:**   Complies  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The boundaries of fire compartment 2-PA-5 are three hour fire rated based on drawings.

Complies with the use of EEEE

Evaluation determines the need for maintaining the fire rating of fire dampers 2GSS-DMPF23A and 23B installed in the wall separating Service Building Fire Area 2-SB-5 and Auxiliary Building Fire Area 2-PA-5. These dampers are in the exhaust ductwork for the Gland Steam Filter Exhaust fans. The evaluation supports maintaining the fire dampers in the open position due to operability and maintenance issues caused by environmental conditions.

Evaluation determines fire resistance of the fire wrap configuration for the ventilation ductwork and associated 1-½ hour fire dampers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

10080-DEC-0184 R1 A0

**References**

- 10080-RM-0301E, Rev. 12, "Hazard Boundaries El. 774 - 7"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-5**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies via Previous Approval & Complies with use of Evaluation

**Fire Dampers:**

Dampers have a 1 ½ hour fire rating and are installed in pairs. Damper assemblies located outside the fire barrier are wrapped with 1 hour fire wrap. The SSERs concluded the dampers in series and wrapped with 1 hour fire wrap are an acceptable deviation. An evaluation supports maintaining fire dampers 2GSS-DMPF23A and 23B in the open position due to operability and maintenance issues caused by environmental conditions.

Complies via Previous Approval

**Fire Doors:**

All doors are 3 hr fire rated per drawings. Doors are inspected by procedure. The SSERs concluded the security modifications are an acceptable deviation.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- FPPCE 06-043 BV2 R0
- FPPCE 13-030 Rev.0

**References**

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RA-0036B, Sht. 2, Rev. 15, "Plans Auxiliary Building"
- 10080-RB-0034B, Rev. 11, "Ventilation Arrangement SB"
- 87-05-05, "BV2 SSER "
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-5**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"
- 10080-RE-0037CK, Rev. 11, "COND AB ASP"
- 10080-RP-0117J, Rev. 7, "SLV LOC AB 773"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0037BS, Rev. 5, "Conduit Slv AB"
- 10080-RE-0037E, Rev. 18, "COND SLV AB"
- 10080-RP-0117K, Rev. 7, "Slv Loc AB"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-6**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

This area is separated from PA-4 and its redundant counterpart (PA-7) by 3-hour fire-rated walls and ceilings which exceed the required rating. All penetrations are sealed with a material having a rating equivalent to the barrier rating.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EI 760 7"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PA-6**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Fire Dampers:

There are no duct penetrations in the PA-6 fire barriers.

Fire Doors:

The fire door has a 3 hr fire rating and is inspected by procedure.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-PA-6

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RE-0037CK, Rev. 11, "COND AB ASP"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0048AC, Rev. 4, "CND PL AB"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-PA-7

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

2-PA-7 is separated from 2-PA-4 and its redundant counterpart (2-PA-6) by 3-hour fire-rated walls and ceilings which exceed the required rating.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EI 760 7"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 2-PA-7

**Compliance Statement:** Complies

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire Dampers:

There are no dampers associated with this fire compartment.

Fire Doors:

The fire door that separates fire compartment 2-PA-7 from adjacent fire compartments is listed as having a 3 hr fire rating. The door is inspected by procedure.

##### Licensing Actions

- None

##### Supporting EEEEs

- None

##### References

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RB-0044A, Rev. 11, "VENTILATION AUX BLDG"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

##### Open Items and VFDRs

-None



## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - 2-PA-7

**Compliance Statement:** Complies with use of EEEE

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

#### **Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

#### Licensing Actions

- None

#### Supporting EEEEs

- None

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RE-0037CK, Rev. 11, "COND AB ASP"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RE-0048AC, Rev. 4, "CND PL AB"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

#### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PT-1**

**Compliance Statement:**   Complies  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

Fire Compartment 2-PT-1 consists of the pipe tunnel area. Calculation B-221 documented detector spacing.

The following critical attributes of the smoke detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10 comply with the exception of item 3.

1.   Confirmed detectors are mounted on the ceiling.
2.   There are no significant platforms in the compartment as described in the standard.
4.   Confirmed the fire detectors are periodically tested by the procedure.
5.   Confirmed in this area there are no air duct detectors.
6.   Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7.   Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8.   Confirmed that all circuits between the detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9.   Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10.  There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies with Clarification

3.   The pipe tunnel on elevation 725' around Safeguards Building does not contain or present a fire hazard. For this reason fire detection was not provided in this portion of 2-PT-1. The PRA for this Fire Compartment also used the partial area coverage as installed. The PRA conclusion given the partial area detection coverage

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

for 2-PT-1, along with the DFM and PRA, is that the current fire detection system is acceptable.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RC-0031T, Rev. 5, "MS CV Bldg"
- 10080-TLD-033D-040-01, Rev. 4, "Zone 40 CV Smoke Det"
- 10080-TLD-033D-040-03, Rev. 4, "TLD Station FD System Zone 40 CV Smoke Det"
- 87-05-05, "BV2 SSER "
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4  
TER-012608 R0

- 10080-RA-0001C, Sht. 1, Rev. 10, "Floor Plan - Service Building"
- 10080-RC-0031C, Rev. 10, "MN STM and CV Bldg EI 735 6"
- 10080-RE-0064H, Rev. 5, "CND PLN FD MN STM & CA VAULT"
- 10080-TLD-033D-040-02, Rev. 4, "Zone 40 CV smoke Det"
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"
- FPSRR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

Beaver Valley Unit 2

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Fire Compartment - 2-PT-1**

**Compliance Statement:**   Complies  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

The walls, ceilings, and floors have a fire rating of 3 hours excluding the seismic shake space seals.

Complies with use of EEEE

An evaluation provides unique identifiers to seismic shake space seals that require inspection, and provides a basis for excluding, where applicable, those shake space seal locations from having a fire rated seal. Shake space Rodofam form material was typically left in situ after building concrete floor slabs, walls, etc. were poured. Fire seals are installed in seismic shake spaces in barriers between fire areas where these shake spaces open into more than one fire area, but only steel cover plates are installed over spaces at columns, etc. which are internal to the fire areas. Since the cover plates alone have not been tested to qualify them as fire rated configurations, the Rodofam beneath them is being added to the combustible loading in each of the various fire areas where it is present.

Overall barrier integrity is not compromised by not providing and maintaining fire rated seals at the subject locations which do not communicate to other fire areas. Unrelated barrier penetrations to other fire areas remain as 3-hour fire rated configurations.

An engineering evaluation determined that the configuration of the ductwork and fire wrap associated with 1 ½ hour fire dampers 2HVS\*DMPF211 and 2HVS\*DMPF212, installed in series between 2-SG-1S and 2-PT-1, is adequate for the hazard.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 10080-RM-0301A, Rev. 6, "Hazard Boundaries"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Supporting EEEEs**

- FPPCE 12-100 Rev.0
- TER-012608 R0

- 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"
- 87-05-05, "BV2 SSER "
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PT-1**

**Compliance Statement:**   Complies  
                                      Complies by Previous Approval  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**       3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies by Previous Approval

Fire Dampers:

Duct penetrations are provided with two 1 1/2 - hour fire-rated dampers in series. The SSER indicated the installation of two 1 1/2 hr. fire dampers in series in lieu of one 3 hr. fire damper was used in various ducts. The SSERs concluded the dampers in series are an acceptable deviation.

Complies

Fire Doors:

All doors are 3 hr fire rated per drawings. Doors are inspected by procedure.

Complies with use of EEEE

FPPCE 13-030 concludes the horizontal sliding door overlap is acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"
- 10080-RA-0036F, Rev. 10, "Plan Floor 718' & 710' Aux Bldg"
- 10080-RC-0031A, Rev. 12, "CV Fnd 718"

**Supporting EEEEs**

FPPCE 13-030 Rev.0

- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RB-0014A, Rev. 15, "Vent Arrangement Primary Plant"
- 87-05-05, "BV2 SSER "

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-PT-1**

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

- 10080-DEC-0188 R0 A0
- 10080-DMC-0054 Rev.2 A4

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 10080-RA-0009F, Rev. 5, "SHAKE SPACE FIRE STOPS"
- 10080-RA-0036F, Rev. 10, "Plan Floor 718' & 710' Aux Bldg"
- 10080-RE-0032A, Rev. 16, "Ductline Plans and details"
- 10080-RM-0301A, Rev. 6, "Hazard Boundaries"
- 10080-RP-0116H, Rev. 8, "Slv Loc MSVH"
- 10080-RP-0117U, Rev. 6, "Slv Loc Pipe Tunnel"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 10080-RA-0009G, Rev. 4, "SHAKE SPACE FIRE STOPS"
- 10080-RC-0031A, Rev. 12, "CV Fnd 718"
- 10080-RE-0037H, Rev. 14, "Conduit & Slvs control Bldg"
- 10080-RP-0064D, Rev. 8, "slv Loc Ser Bldg"
- 10080-RP-0116K, Rev. 14, "SLV LOC MS"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-RC-1**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:**     3.8.2 - Detection

**Compliance Basis:**

Fire Compartment 2-RC-1 consists of the Reactor Containment Building. The compartment is provided with photoelectric smoke detectors for hazard protection in the cable penetration area on elevations 752'-6" and 768'-6" and in the RHR pump area on elevation 692'-11".

The following critical attributes of the fire detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975:

Complies

Items 1 through 10 with the exception of items 1 and 3.

2.   There are no significant platforms in the compartment as described in the standard.
3.   Confirmed detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage and designated areas.
4.   Confirmed the fire detectors are periodically tested by the procedure.
5.   Confirmed in this area there are no air duct detectors.
6.   Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7.   Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8.   Confirmed that the circuits between the detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that the control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

Complies by Prior Approval

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

1. Containment does not have full area detection. Although the detectors are not located on the ceiling of the Reactor Containment, they are located to detect a fire in these two specific areas (cable penetration area and RHR pump area). The detectors are uniquely located above the protected hazards. Limited area detection for 2-RC-1 was previously approved in the SSER (NUREG 1057, Supp. No. 5) dated May 1987.

3. Detection in only these two areas of 2-RC-1 (cable penetration area and RHR pump area) was previously approved in the SSER (NUREG 1057, Supp. No. 5) dated May 1987.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 10080-TLD-033D-064-01, Rev. 4, "FD ZONE 64 REACTOR CONT"  
- 10080-TLD-033D-065-01, Rev. 4, "FD ZONE 65 REACTOR CONT"  
- 2OST-33.21A, Rev. 6, "Containment Smoke Detection Instrument Test"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 10080-RE-0064AX, Rev. 3, "CABLE BLOCK FD 2DGP-3 & 4"  
- 10080-TLD-033D-064-02, Rev. 5, "FD ZONE 64 REACTOR CONT"  
- 10080-TLD-033D-065-02, Rev. 5, "FD ZONE 65 REACTOR CONT"  
- 87-05-05, "BV2 SSER "  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

Beaver Valley Unit 2

**Fire Compartment - 2-RC-1**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:**     3.9.1 - NFPA Standards

**Compliance Basis:**

Fire Compartment 2-RC-1 has four fixed water spray systems in service. The two Containment Penetration Area systems and two RHR Pump systems are automatic, with control room notification and manual action to initiate water flow as approved by the current licensing basis from NUREG-1057.

Complies by Prior Approval

The NRC concluded in its SER that manually operated deluge spray systems provided for the protection of the cable penetration area and RHR pumps are acceptable. These four fixed water spray systems are the only required systems in Containment, as previously approved by the NRC and documented in NUREG-1057.

Complies

Fire compartment 2-RC-1 and Containment Cable Penetration Area and Residual Heat Removal Pump deluge systems comply as follows:

1. Available water supply exceeds system and hose stream demand for the area deluge systems.
2. System water spray design densities meet the minimum acceptable criteria for the hazards per the design standard. Nozzle orientation was verified by walkdowns and judged adequate to provide design densities. A clarification of the nozzle spray arrangement is included in Attachment T.
3. Piping and fittings are designed for the required working pressure.
4. Piping and fittings are protected from corrosion.
5. The directional spray nozzles are UL listed and FM approved.
6. There is a main pipeline strainer for these systems.
7. Individual nozzle strainers are not required because the nozzle passageways are larger than 1/8 inch.
8. Unapproved gasketed fittings are not used in the design of the suppression systems.

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

10. The automatic detection equipment is electrically supervised for waterflow, trouble, and alarm, indicating locally and on the Main Control Room annunciator panel.

11. Primary and secondary power sources are addressed in NFPA 805 Transition Record 3.8.1.

12. The compensatory measures shown in 1/2-ADM-1900 for system impairment are appropriate for the level of importance of these systems.

Will Comply with the Use of Commitment

9. Verification of system actuation within 30 seconds after heat detector activation will be included in procedures pending resolution of Open Item BV2-1372.

### **Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

### **Supporting EEEEs**

- None

### **References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"

- 10080-RM-0433-001D, Rev. 13, "Valve Oper No Diagram Fire Prot Wtr Contmt Bldg"

- 10080-TLD-033C-037-01, Rev. 3, "FPW CABLE PEN AREA A DLV"

- 10080-TLD-033C-078-01, Rev. 3, "Test Loop Diagram FP Water RC Cable Penetration Area A Fire Detectors"

- 10080-TLD-033D-064-01, Rev. 4, "FD ZONE 64 REACTOR CONT"

- 2010-180-173-009, Sht. 19, Rev. E, "BV Power Unit #2 Contract No. 2BVC-173"

- 2510.180-173-002, Rev. E, "Operation and Maintenance Manual for 2BVS-173"

- 2BVS-0914, Rev. 4, "Specification for Interior Fire Protection System"

- 2DBD-33B, Rev. 10, "Fire Protection System"

- 2OST-33.21, Rev. 8, "CONT FPS RFO TEST"

- 87-05-05, "BV2 SSER "

- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

- 10080-RM-0433-001A, Rev. 22, "Valve Oper No Diagram Fire Prot Wtr-Distribution Network"

- 10080-TLD-033C-032-01, Rev. 3, "FPW CABLE PEN AREA RHR"

- 10080-TLD-033C-038-01, Rev. 3, "FPW CABLE PEN AREA B DLV"

- 10080-TLD-033C-080-01, Rev. 2, "Test Loop Diagram FP-Water RC Cable Penetration Area B Fire Detectors"

- 10080-TLD-033D-065-01, Rev. 4, "FD ZONE 65 REACTOR CONT"

- 2010.180-173-102, Rev. E, "Contract No. 2BVC-173"

- 2710-180-173-048A, "Hydraulic Calculation for 2FE-WS-3K6&7"

- 2BVS-173, Rev. 5, "Sprinkler and Water Spray Fire Protection Systems"

- 2OST-33.12, Rev. 11, "Fire Protection System Valve Stroke Test"

- 2OST-33.21A, Rev. 6, "Containment Smoke Detection Instrument Test"

- ECP 08-0711, Rev. 2, "FP Modification of Containment Iodine Filters 2HVR-FLTA211A & B"

- NUREG 1057 10/85, "NRC SER - NUREG 1057 dated October 1985"

- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

<b>Item Number</b>	BV2-1369	<b>Item Title:</b> BV2 Hydraulic Calculations
<b>Item Number</b>	BV2-1372	<b>Item Title:</b> BV2 Procedure Update 20ST-33.21

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-RC-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.2 - Water Flow Alarm

**Compliance Basis:**

RHR Pump and Electrical (Cable) Penetration areas: These areas are provided with a single flow alarm device on its deluge valve that sends its alarm signal to the local and main control room alarm panels.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 10080-RM-0433-001D, Rev. 13, "Valve Oper No Diagram Fire Prot Wtr Contmt Bldg"  
- 10080-TLD-033C-035-02, Rev. 3, "FPW RHR P21B DLV"  
- 10080-TLD-033C-037-02, Rev. 5, "FPW CABLE PEN AREA A DLV"  
- 10080-TLD-033C-039-01, Rev. 4, "Test Loop Diagram FP Water Cable Penetration Area and RHS Pumps Deluge System Flow"

- 10080-TLD-033C-032-01, Rev. 3, "FPW CABLE PEN AREA RHR"  
- 10080-TLD-033C-036-02, Rev. 3, "FPW RHR P21A DLV"  
- 10080-TLD-033C-038-02, Rev. 3, "FPW CABLE PEN AREA B DLV"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-RC-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.3 - Suppression system annunciation

**Compliance Basis:**

RHR Pump and Electrical (Cable) Penetration areas: Alarms associated with the deluge valves for these areas annunciate in the control room.

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 10080-E-10L, Rev. 21, "Window Arrangement - Annunciator A10"  
- 10080-RM-0433-001D, Rev. 13, "Valve Oper No Diagram Fire Prot Wtr  
Contmt Bldg"  
- 10080-TLD-033C-035-01, Rev. 3, "FPW RHR P21B DLV"  
- 10080-TLD-033C-037-01, Rev. 3, "FPW CABLE PEN AREA A DLV"  
- 20ST-33.21, Rev. 8, "CONT FPS RFO TEST"

- 10080-RM-0433-001A, Rev. 22, "Valve Oper. No. Diagram - Fire Prot Wtr  
Distribution Network"  
- 10080-TLD-033C-032-01, Rev. 3, "FPW CABLE PEN AREA RHR"  
- 10080-TLD-033C-036-01, Rev. 3, "FPW RHR P21A DLV"  
- 10080-TLD-033C-038-01, Rev. 3, "FPW CABLE PEN AREA B DLV"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-RC-1

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.5 - OS&Y gate valve

**Compliance Basis:**

RHR Pump and Electrical (Cable) Penetration areas: The containment fire protection water systems supply lines are equipped with OS&Y valves outside containment as well as an additional air operated valve that is installed for "containment integrity".

**Licensing Actions**

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

**Supporting EEEEs**

- None

**References**

- 10080-RM-0433-001A, Rev. 22, "Valve Oper. No. Diagram - Fire Prot Wtr  
Distribution Network"

- 10080-RM-0433-001D, Rev. 13, "Valve Oper No Diagram Fire Prot Wtr  
Contmt Bldg"

**Open Items and VFDRs**

-None



## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - 2-RC-1

**Compliance Statement:** Complies

#### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Water-Based Suppression

**SubSection:** 3.9.6 - Valve Performance

#### **Compliance Basis:**

RHR Pump and Electrical (Cable) Penetration areas: All OS&Y valves are provided with contacts to indicate when the valves are not fully open. Alarms associated with the contacts are monitored in the control room. Valves are tested by procedure to verify alarm annunciation.

#### Licensing Actions

- 08 Safe Shutdown Components - Lack of Separation of Redundant Trains -  
BTP C.5.b

#### Supporting EEEEs

- None

#### References

- 10080-E-10L, Rev. 21, "Window Arrangement - Annunciator A10"

- 10080-RM-0433-001D, Rev. 13, "Valve Oper No Diagram Fire Prot Wtr  
Contmt Bldg"

- 20ST-33.21, Rev. 8, "CONT FPS RFO TEST"

- 10080-RM-0433-001A, Rev. 22, "Valve Oper. No. Diagram - Fire Prot Wtr  
Distribution Network"

- 20ST-33.12, Rev. 11, "Fire Protection System Valve Stroke Test"

#### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-RC-1**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The containment structure perimeter consists of a 10 ft concrete mat, with 4 ft-6 in. thick reinforced concrete walls up to the dome transition. The dome consists of a minimum thickness of 2 ft-6 in. reinforced concrete. A continuous steel liner is provided on the entire interior to ensure leak tightness of the containment structure. This structural design constitutes a 3-hour fire barrier.

2-RC-1 is not specifically identified in the inspection procedure as an area required to be included in the inspection; however, the fire areas surrounding 2-RC-1 are each listed on the data sheet, which would allow for inspection of the exterior of the containment walls.

**Licensing Actions**

- 31 Access Hatch - Unrated Containment Hatch - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-B-085, Rev. 14, "Fire Hazard Analysis"

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 2-RC-1

**Compliance Statement:** Complies by Previous Approval

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.3 - Fire barrier penetrations

##### Compliance Basis:

Fire Doors

The containment access hatch does not contain a UL label or certification of fire testing. The hatch was designed to meet multiple accident criteria. The NRC concluded in SER 5 that combustible loading near the hatch is low; therefore, there is reasonable assurance that a fire of significant magnitude or duration will not occur near the air lock. Therefore, an unrated containment access hatch is an acceptable deviation from Section C.5.a(5) of BTP CMEB 9.5-1.

Fire Dampers

Ventilation penetrations for the purge duct system are constructed as a schedule 40 carbon steel piping system with normally closed containment isolation valves. Section 3.11.3 does not apply to this system.

##### Licensing Actions

- 31 Access Hatch - Unrated Containment Hatch - BTP C.5.a(5)

##### Supporting EEEEs

- None

##### References

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"  
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

##### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-RC-1**

**Compliance Statement:**   Complies  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies

Containment is unique in that the structure is designed to withstand design basis accidents. The doors and penetrations into containment, although not fire rated by UL, are designed to withstand severe accident conditions that would typically exceed UL fire test standards and, as such, should be considered capable of providing adequate separation for adjacent fire areas.

Complies with Use of EEEE

FPPCE 12-088 was issued which concludes that the installed configurations of both Unit 1 and Unit 2 electrical penetration assemblies are adequate for the hazard presented in the fire areas.

**Licensing Actions**

- 31 Access Hatch - Unrated Containment Hatch - BTP C.5.a(5)

**Supporting EEEEs**

FPPCE 12-088 Rev.0

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-S-1**

**Compliance Statement:**   Complies  
                                      Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

Fire Compartment 2-S-1 consists of the Cable Vault Northwest Stairwell and Personnel Access Tunnel / Passageway. The barriers which comprise this compartment are 3-hour rated.

Complies with Use of Commitment

The area complies with the use of a commitment to add the fire barriers of 2-S-1 to plant surveillance procedures per Open Item BV2-1576.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEs**

- None

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"  
- 10080-RA-0036G, Rev. 8, "Stair Det's. Auxiliary Bldg."  
- 10080-RC-0005D, Rev. 6, "Gnd. Fl-Plans Sects & Dets Turbine Building Sh 3."  
- 10080-RM-0301A, Rev. 6, "Hazard Boundaries"  
- 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- 8700-RC-0008Q, Rev. 10, "Plan @ EL 707'-6" & 725'-6" Control Room Extension"  
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

- 10080-RA-0009D, Rev. 9, "Miscellaneous Details"  
- 10080-RC-0005A, Rev. 13, "Ground Floor Slab El. 730'-6" Turbine Bldg."  
- 10080-RC-0036C, Rev. 7, "Plan El. 735'-6"- Reinf. Auxiliary Building"  
- 10080-RM-0301B, Rev. 15, "Hazard Boundaries El 735 - 6"  
- 10080-RM-0301D, Rev. 15, "Hazard Boundaries El 760 7"  
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"  
- 8700-RC-0008U, Rev. 8, "Sections & Details Sh. 3 Control Room Extension"

**Open Items and VFDRs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

<b>Item Number</b>	BV2-1576	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-S-1**

**Compliance Statement:**   Complies  
                                      Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Penetrations in 2-S-1 fire barriers are provided with fire-rated door assemblies or listed fire dampers.

Complies by Previous Approval

A deviation from BTP C.5.a(5), Modified fire doors, applies to door A-22-1 for an unsupervised fire door to an area protected by a gas suppression system per NUREG 1057.

Will Comply with the Use of Commitments

Open Item BV2-1576 commits 2-S-1 to be added to plant periodic surveillance procedures.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-RA-0005C, Rev. 5, "Elevator Enclosure Detail"  
- 10080-RA-0036A, Sht. 1, Rev. 16, "Plans Auxiliary Building"  
- 10080-RC-0031C, Rev. 10, "MN STM and CV Bldg El 735 6"  
- 10080-RC-0054C, Rev. 5, "Plan 735'-6" Cond Polish. Bldg"  
- 8700-RA-0020A, Rev. 10, "Floor Plans Main Entrance & Control Rm"

- 10080-RA-0010A, Rev. 7, "Stairs TB"  
- 10080-RA-0036F, Rev. 10, "Plan Floor 718' & 710' Aux Bldg"  
- 10080-RC-0036C, Rev. 7, "Plan El. 735'-6"- Reinf. Auxiliary Building"  
- 10080-RM-0003A, Rev. 22, "Mac Loc TB el 730-6"  
- NUREG 1057, Supp 5 11/86, "NRC SER - NUREG 1057, Supp No. 5 dated November 1986"

**Open Items and VFDRs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

<b>Item Number</b>	BV2-1576	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-S-1**

**Compliance Statement:** Complies with use of EEEE  
Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with Use of Commitment

Perimeter fire barriers for this fire compartment, including exposed surfaces of all fire rated equipment (i.e. walls, floors, ceilings, etc.) and penetration seals, are to be included in an inspection procedure per BV1-1576.

**Licensing Actions**

- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10.001-907, Rev. A, "Typicals MP-1 & MP-2 Wall/Floor Flexible Fire Seals"  
- 10080-RB-0097A, Rev. 6, "CO2 Fire Protection System Cable Vault & Rod Control Area"

- 10.001-908, Rev. A, "MP-1,2 Notes and References"  
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

Item Number	Item Title:
BV2-1576	Addition of Barriers to Surveillance Procedures

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-S-4**

**Compliance Statement:**   Complies  
                                      Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

Complies

Fire compartment 2-S-4 consists of Cable Vault West Stairwell. The barriers which comprise this compartment are 3-hour rated.

Complies with the Use of Commitment

The area complies with the use of a commitment to add its fire barriers to plant surveillance procedures per BV2-1576.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- 10080-DEC-3560, Rev. 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- 10080-RA-0010E, Sht. 1, Rev. 8, "Stair Details Cable Vault"
- 10080-RM-0301A, Rev. 6, "Hazard Boundaries"
- 10080-RM-0301C, Rev. 14, "Hazard Boundaries EI 752' 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

- 10080-RA-0001E, Sht. 3, Rev. 9, "Floor Plan - Service Building"
- 10080-RC-0031E, Rev. 9, "MN STM & CABLE VAULT BLDG EL 755'-6"
- 10080-RM-0301B, Rev. 15, "Hazard Boundaries EI 735 - 6"
- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EI 760 7"
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

<b>Item Number</b>	BV2-1576	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-S-4**

**Compliance Statement:**   Complies  
   Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**    3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies

Penetrations in 2-S-4 fire barriers are provided with fire-rated door assemblies. No ventilation ductwork or fire dampers are present.

Will Comply with the Use of Commitment

Open Item BV2-1576 commits 2-S-4 to be added to plant periodic surveillance procedures.

**Licensing Actions**

- None

**Supporting EEEs**

- None

**References**

- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"
- 10080-RC-0031C, Rev. 10, "MN STM and CV Bldg El 735 6"
- 10080-RC-0031G, Rev. 11, "MS & CV Slab Plan 773'-6"

- 10080-RC-0031A, Rev. 12, "CV Fnd 718"
- 10080-RC-0031E, Rev. 9, "MN STM & CABLE VAULT BLDG EL 755'-6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Open Items and VFDRs**

<b>Item Number</b>	BV2-1576	<b>Item Title:</b> Addition of Barriers to Surveillance Procedures
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**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-S-4**

**Compliance Statement:** Complies with use of EEEE  
Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10 evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

Will Comply with Use of Commitment

Perimeter fire barriers for this fire compartment, including exposed surfaces of all fire rated equipment (i.e. walls, floors, ceilings, etc.) and penetration seals, are to be included in an inspection procedure per BV1-1576.

**Licensing Actions**

- None

**Supporting EEEEs**

- None

**References**

- B-240, Rev. 0, "Fire Seal Eval Untested Design"

**Open Items and VFDRs**

Item Number	Item Title:
BV2-1576	Addition of Barriers to Surveillance Procedures

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

#### Fire Compartment - 2-SB-1

**Compliance Statement:** Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

#### Compliance Basis:

Fire Compartment SB-1 contains the orange safety-related 4 kV switchgear, and 480 V substation which supplies power to Class 1E circuits required for safe shutdown.

The following critical attributes of the fire detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10.

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

#### Licensing Actions

#### Supporting EEEEs

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RC-0009B, Rev. 6, "Floor Plan EI 745 SB"
- 10080-TLD-33D-001-01, Rev. 6, "Test Loop Diagram Loop 1"
- 10080-TLD-33D-001-03, Rev. 6, "Test Loop Diagram Zone 1"
- B-81, Rev. 0, "Early Warning System For Service Building"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

- 10080-RC-0009A, Rev. 9, "Floor Plan and Dets SB EI 745"
- 10080-RE-0064E, Rev. 5, "Cnd Plan FD Service Bldg ei 730 745"
- 10080-TLD-33D-001-02, Rev. 6, "Test loop Diagram Zone 1"
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-1**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

The fire barriers associated with SB-1, excluding the removable hatch discussed below, are 3 hr. rated barriers. The concrete walls are a minimum of 12 inches thick. The ceiling is concrete slab on concrete beam construction. The floor is concrete on grade.

Complies by Previous Approval

A deviation for ventilation duct protected by fire wrap was accepted in the NRC SSER 5 dated May 1987.

Complies with the use of EEEE

DEC-0190 evaluated the removable hatch covers located in the floors and constructed of corrugated steel decking with 1.125" nominal thickness Thermo-Lag panels fastened to both the top and bottom of the decking. The hatch covers are non load bearing and only have to support their own weight. Based on comparison to fire tests (U.L. and Omega Labs) the as-installed design has a 3 hour equivalent fire barrier resistance rating.

**Licensing Actions**

- 03 Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3)
- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0184 R1 A0
- 10080-DEC-0190 R1 A0

**References**

- |  |  |
|--|--|
| - 10080-DEC-0190, Rev. 1, "Thermo-Lag JB Misc Design"                  | - 10080-RA-0001C, Sht. 1, Rev. 10, "Floor Plan - Service Building" |
| - 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"        | - 87-05-05, "BV2 SSER "  |
| - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report" | - FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"    |

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-1**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

The NRC granted requested deviations for fire door modifications, 1 1/2 hr fire dampers installed in series and the use of fire wrap on ducts associated with fire compartment 2-SB-1.

**Fire Dampers:**

Penetrations are provided with either two 1 1/2-hr fire dampers in series or with 1 hour fire wrap in lieu of a fire damper. The SSER concluded the fire dampers in series are an acceptable deviation.

**Fire Doors:**

Fire doors separate 2-SB-1 from adjacent compartments and are inspected by procedure. Modifications were made in accordance with recommendations supplied by UL. The SSER concluded the security modifications are an acceptable deviation.

Complies with use of EEEE

FPPCE 13-030 concludes the horizontal sliding door overlap is acceptable.

**Licensing Actions**

- 03 Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3)
- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"

**Supporting EEEEs**

FPPCE 13-030 Rev.0

- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- |   |  |
|---|--|
| - 10080-DEC-0184, Rev. 1, "Engineering Evaluation of Thermolag Deviations from Installation Procedures" | - 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"                     |
| - 10080-RB-0034A, Rev. 9, "Ventilation Service Building"  | - 10080-RB-0034C, Rev. 3, "Ventilation Service Building"               |
| - 10080-RB-0035A, Sht. 1, Rev. 10, "Ventilation Service Building"                                       | - 10080-RB-0035C, Sht. 3, Rev. 10, "Ventilation Service Building"      |
| - 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"   | - 2OST-33.5, Rev. 18, "Fire Protection System Inspection Test"         |
| - 87-05-05, "BV2 SSER "   | - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report" |
| - FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"   |  |

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 2-SB-1

**Compliance Statement:** Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

##### Licensing Actions

- 03 Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3)
- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

##### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

##### Supporting EEEEs

- 10080-DEC-0188 R0 A0
- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- 87-05-05, "BV2 SSER "
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

##### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-SB-10

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

Fire compartment 2-SB-10 consists of Battery Room 2-5 located within the Service Building Emergency Switchgear Room fire compartment 2-SB-4. The fire barriers associated with this compartment are 3 hr. fire rated.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

**Supporting EEEs**

- None

**References**

- 10080-RA-0001E, Sht. 3, Rev. 9, "Floor Plan - Service Building"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"  
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"  
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"  
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-10**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies by Prior Approval

Fire Dampers:

There are two HVAC duct penetrations in the barrier between 2-SB-10 and adjacent fire compartment 2-SB-4. Both penetrations are provided with two 1 ½ hour fire rated dampers. The SSERs indicated the installation of two 1 1/2 hr fire dampers in series in lieu of one 3 hr fire damper was used in various ducts. The SSERs concluded the dampers in series are an acceptable deviation.

Complies

Fire Doors:

Fire doors are listed as 3 hour fire rated and are inspected by procedure.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"  
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"  
- 10080-RB-0035C, Sht. 3, Rev. 10, "Ventilation Service Building"  
- NUREG 1057, Supp 3 11/86, "NRC SER - NUREG 1057, Supp No. 3 dated November 1986"

**Open Items and VFDRs**

-None

**Supporting EEEEs**

- None

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"  
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"  
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"  
- NUREG 1057, Supp 5 5/87, "NRC SER - NUREG 1057, Supp No. 5 dated May 1987"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-SB-10

**Compliance Statement:** Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

**Compliance Basis:**

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

**Supporting EEEEs**

- None

**References**

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"  
- 10080-RM-0301C, Rev. 15, "Hazard Boundaries EL 752 - 6"  
- 10080-RM-0301E, Rev. 12, "Hazard Boundaries EL 774 - 7"  
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"  
- B-240, Rev. 0, "Fire Seal Eval Untested Design"

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"  
- 10080-RM-0301D, Rev. 15, "Hazard Boundaries EL 760 7"  
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"  
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-2**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

Fire Compartment SB-2 contains the purple safety-related 4 kV switchgear, and 480 V substation which supplies power to Class 1E circuits required for safe shutdown. Battery rooms SB-8 and SB-9 are located within SB-2.

The following critical attributes of the fire detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10.

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

**Supporting EEEEs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 10080-RC-0009B, Rev. 6, "Floor Plan EI 745 SB"
- 10080-TLD-33D-002-01, Rev. 4, "Test Loop Diagram Zone 2"
- 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test"
- B-221, Rev. 0, "Evaluation of Detector Locations for Early Warning FD System"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- 10080-RC-0009A, Rev. 9, "Floor Plan and Dets SB EI 745"
- 10080-RE-0064E, Rev. 5, "Cnd Plan FD Service Bldg el 730 745"
- 10080-TLD-33D-002-02, Rev. 4, "Test Loop Diagram Zone 2"
- 2OST-33.16B, Rev. 2, "PULL STATION, FIRE PANEL, AND HORN INSTRUMENTATION TEST"
- B-81, Rev. 0, "Early Warning System For Service Building"
- FPSSR, Add. 37, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-2**

**Compliance Statement:**   Complies by Previous Approval  
                                     Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.2 - Fire barriers

**Compliance Basis:**

The perimeter walls of two emergency switchgear areas are of reinforced concrete having a minimum 3-hour barrier. The ceiling of the emergency switchgear areas is a 3-hour fire rated barrier. Switchgear rooms are located in the service building at el 730 ft-6 in. and are separated from the remainder of BVPS-2 by 3-hour fire rated barriers except as discussed below.

Complies by Prior Approval

This fire compartment has four deviations: two 1 1/2 hour fire dampers in series in lieu of one 3 hour damper, ventilation duct fire wrapped in lieu of damper and modified fire doors. These items are identified as BTP items C.5.a, C.5.a(4) and (5). These deviations were accepted in the NRC SSER 5 dated May 1987. The fourth deviation C.5.b "Safe Shutdown Capability" to: a. Separate safety-related systems from any potential fires in nonsafety-related areas that could affect their ability to perform their safety function. b. Separate redundant divisions or trains of safety-related systems from each other so that both are not subject to damage from a single fire. c. Separate individual units on a multiple-unit site unless the requirements of General Design Criterion 5 are met with respect to fire, which would include the common control room and intake structure.

Complies with use of EEEE

Evaluation DEC-0184 evaluates the acceptability of 3M Interam E-50 series blanket assemblies that provide a one hour fire resistance for the ductwork use during a fire for ventilation and a 2 hour fire resistance for the protection of the 1-½ hour fire dampers.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

10080-DEC-0184 R1 A0

**References**

- 10080-RA-0001C, Sht. 1, Rev. 10, "Floor Plan - Service Building"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-2**

**Compliance Statement:**   Complies by Previous Approval  
                                      Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:**     3.11.3 - Fire barrier penetrations

**Compliance Basis:**

Complies via Previous Approval

**Fire Dampers:**

Penetrations between 2-SB-2 and adjacent compartments are provided with either two 1 ½ hr fire dampers in series or with 1 hour fire wrap in lieu of a fire damper. The SSERs concluded dampers in series and fire wrap are an acceptable deviation. An evaluation compared installed configurations for 3M E-50 Series Interam fire wrap material to tested configurations to demonstrate the installed barrier provides a fire barrier equal to 1 hour when used to protect metal ducts and up to 2 hours when protecting fire dampers.

**Fire Doors:**

SSERs stated there are number of security modifications that have been made to fire doors and were made in accordance with recommendations supplied by UL. The SSERs concluded security modifications are an acceptable deviation.

Complies with use of EEEE

FPPCE 13-030 concludes the horizontal sliding door overlap is acceptable.

**Licensing Actions**

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"
- 1/2PMP-75VS-VNT-4M, Rev. 13, "Ventilation System Fire Damper Maintenance and Trip Check"

**Supporting EEEEs**

FPPCE 13-030 Rev.0

- 1/2PMP-33FP-FIRE DOORS-1M, Rev. 9, "Periodic Inspection of Fire Doors"
- 10080-RA-0006A, Sht. 1, Rev. 30, "Door Schedule"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- |  |   |
|--|---|
| - 10080-RB-0034A, Rev. 9, "Ventilation Service Building"               | - 10080-RB-0034C, Rev. 3, "Ventilation Service Building"        |
| - 2OST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"        | - 2OST-33.5, Rev. 18, "Fire Protection System Inspection Test"  |
| - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report" | - FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report" |

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

Beaver Valley Unit 2

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

##### Fire Compartment - 2-SB-2

**Compliance Statement:** Complies with use of EEEE

##### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.4 - Through Penetration Fire Stops

##### Compliance Basis:

Complies with use of EEEE

The penetration seal designs are based on typical tested and approved fire seals. BV2 contains some penetrations between fire areas where it is often impossible to achieve an exact duplication of the specific test configuration of penetration seal designs for fire protection requirements. GL 86-10, evaluations have been completed and documented to justify penetration seals installed to untested seal designs.

DEC-0188 evaluates conduit sleeve extensions that extend out beyond the fire barrier by 2 ft. and are sealed at the sleeve end with a three hour fire seal. The sleeve is protected from the barrier to the end of the sleeve with either ½" or 1" thick Thermo-Lag. SSER 5 states the applicant proposes to wrap the conduit with a 1-hour fire wrap material. SSER specifically identifies the fire wrap as one hour.

Evaluation number four (4) of DMC-2840 is associated with Unit 2. Evaluation four examines the need for fireproofing the supplementary structural steel associated with oversize blockouts in various 3 hour fire rated floors.

#### Licensing Actions

- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### References

- 1/2-PIP-M16, Rev. 9, "Penetration Seals"
- 2601.337-844-083, Rev. B, "Internal Conduit Fire Seals EC-1 thru 6"
- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

#### Supporting EEEEs

- 10080-DEC-0188 R0 A0
- 10080-DMC-0054 Rev.2 A4
- 8700-DMC-2840 Rev. 0 Eval #4

- 10080-DMC-0054, Rev. 2, "Untested Seal Design"
- 2BVS-0844, Rev. 0, "Index Only Fire Stops and Seals"
- B-240, Rev. 0, "Fire Seal Eval Untested Design"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

#### Open Items and VFDRs

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Detection

**SubSection:** 3.8.2 - Detection

**Compliance Basis:**

The following critical attributes of the fire detection system were evaluated in respect to NFPA 72E-1978 and NFPA 72D-1975

Items 1 through 10.

1. Confirmed detectors are mounted on the ceiling.
2. There are no significant platforms in the compartment as described in the standard.
3. Confirmed detection spacing does not exceed the allowable listed spacing as modified for the type of ceiling coverage.
4. Confirmed the fire detectors are periodically tested by the procedure.
5. Confirmed in this area there are no air duct detectors.
6. Confirmed in this fire area there are no detectors utilized for releasing fire doors.
7. Confirmed that each zone of fire detectors send a fire alarm to main control room upon actuation of detectors(s) or trouble alarm, or upon fault in the detector circuit.
8. Confirmed that all circuits between the detectors and the local panel required for fire detection alarms are tested for electrical supervision in accordance with NFPA 72D with trouble alarms back to the main control room.
9. Confirmed that all control panels are provided with primary and secondary power sources. The power supplies for the main fire detection and alarm panel in the control room are described in the NFPA 805 Chapter 3 record 3.8.1.
10. There are appropriate compensatory measures established in procedures if a detector or the notifying system becomes non-functional.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and  
Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)

**Supporting EEEEs**

10080-DMC-0054 Rev.2 A4

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- |  |   |
|--|---|
| - 1/2-ADM-1900, Rev. 28, "Fire Protection Program"                         | - 10080-RC-0009D, Rev. 6, "Floor Plan EI 760'-6" SB"              |
| - 10080-RE-0011T, Rev. 19, "Wiring Diag 120/208V AC PNL ESSBS2-5B & 5C"    | - 10080-RE-0064AD, Rev. 4, "WD Fire Det 2DGP-4 Ser Bldg"          |
| - 10080-RE-0064AH, Rev. 11, "WD Fire Det System Misc Detail"               | - 10080-RE-0064AJ, Rev. 5, "WD - fire Det Sys Misc Detail"        |
| - 10080-RE-0064AV, Rev. 3, "Cable Block Diag Fire Det system"              | - 10080-RE-0064AX, Rev. 3, "Cable Block Diagram FD 2DGP-3 2DGP-4" |
| - 10080-RE-0064E, Rev. 5, "Cnd Plan FD Service Bldg el 730 745"            | - 10080-TLD-33D-004-01, Rev. 5, "Test Loop Diagram Zone 4"        |
| - 10080-TLD-33D-004-02, Rev. 5, "Test Loop Diagram Zone 4"                 | - 10080-TLD-33D-004-03, Rev. 5, "Test Loop Diagram Zone 4"        |
| - 2OST-33.16, Rev. 9, "Early Warning Smoke Detection Instrumentation Test" | - 85/10, "BV 2 UFSAR SER"   |
| - BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"     |   |

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:**   Complies  
                                     Complies by Previous Approval  
                                     Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:**     3.10.1 - NFPA Standards

**Compliance Basis:**

Complies

The following critical attributes of the consensus code were evaluated to ensure functionality and reliability:

1.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
2.   A 50% concentration of CO2 is required per NFPA 12. System calculations and post-installation testing show 50% is achieved.
3.   The CO2 will discharge after a pre-discharge time delay during which alarm horns and revolving red lights warn any personnel in the area to evacuate.
4.   Smoke detectors are available in the fire compartment and will actuate the CO2 system if alarmed. This area is equipped with local alarms and alarms in the main control room.
5.   CO2 system is outfitted with a manual discharge station which is tested by procedure.
6.   This CO2 area has dampers that will close upon actuation.
7.   Level and Pressure alarms of the storage tanks are available in the control room.
8.   Pipes are installed to ASTM-A106 in accordance with NFPA 12.
9.   A procedure tests the pre-discharge time on a periodic basis.
10.   This CO2 area has dampers that will close upon actuation.
11.   An overpressure relief path is prevented by the blowout floor plugs.
12.   The primary supply for the fire detection system and suppression systems is the normal off site power supply system. The secondary supply for the fire detection systems is a non-safety diesel generator. The switchover capability is an automatic function.



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

13. A compensatory action plan is required to be established if the system becomes inoperable.

Complies by Previous Approval

10. All doors to this compartment are fire-rated doors and are normally closed. There are unsupervised fire doors in 2-SB-3, which is documented as an accepted deviation in the NUREG 1057 SSER.

Complies with Clarification

14. The testing frequency for the carbon dioxide system testing is every 18 months based on performance of the system. The EPRI Fire Protection Surveillance and Maintenance Guide suggest the use of this frequency.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DMC-0054 Rev.2 A4
- 12241-B-226 R0 A0

**References**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>- 1/2-ADM-1900, Rev. 28, "Fire Protection Program"</li> <li>- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"</li> <li>- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection &amp; Smoke Detection System SH-2"</li> <li>- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"</li> <li>- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"</li> <li>- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"</li> <li>- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"</li> <li>- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"</li> <li>- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"</li> <li>- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "</li> <li>- 2OST-33.13R, Rev. 0, "SB (Zone 4) CO2 Puff Test"</li> <li>- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"</li> <li>- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"</li> </ul> | <ul style="list-style-type: none"> <li>- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"</li> <li>- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"</li> <li>- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"</li> <li>- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"</li> <li>- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"</li> <li>- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"</li> <li>- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"</li> <li>- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"</li> <li>- 2DBD-33B, Rev. 10, "Fire Protection System"</li> <li>- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"</li> <li>- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"</li> <li>- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"</li> <li>- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"</li> </ul> |
|---|---|

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

- UFSAR, Rev. 27, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment -** 2-SB-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.2 - Control room alarm

**Compliance Basis:**

Local status lights are provided on 2FPD-CONTPNL2-4 (El. 745) as well as annunciation in the main control room and input to the plant computer. Control room alarms are Annunciator window A11-1C for fire detection alarm, Annunciator window A11-2C for CO2 system discharge, and Annunciator window A11-3C for CO2 system trouble.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"
- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"
- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 20M-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

**Supporting EEEEs**

- None

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "
- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"
- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"
- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 20M-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:** Complies with Clarification

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.3 - Ventilation to prevent over-pressurization

**Compliance Basis:**

There are no backdraft dampers present for the CO2 system in 2-SB-3. The area is protected from overpressure by built-in weak points (floor plugs) in the ceiling of the room that will lift to relieve pressure and CO2/air mixture into the area above. Braces are placed over the floor plug to allow approximately 1 in. of movement when pressure forces the floor plug to lift. The floor plug is depicted in drawings 10080-RC-0009A and 10080-RC-0009C. Two of the doors were found to need additional reinforcement from the high energy line break analysis and were modified. The other doors for this area were calculated to be adequate for the pressures observed during the above mentioned scenarios.

The last fire seal was installed in the Unit 2 service building (1986-1987). The CO2 full discharge test occurred in January 1988 from which the room pressures were obtained. Therefore, it is expected that the same pressure would be observed under current conditions if a CO2 discharge would occur.

2-SB-3 is not located in the radiologically controlled area of the plant. The supplementary leak collection and release system (SLCRS) provides safety related cooling during accident conditions. The function of the SLCRS is to collect potential containment leakage to the cable vault and rod control area. The air is processed and filtered before release to the atmosphere; therefore, no radiological release from 2-SB-3 is expected.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- |  |  |
|--|--|
| - 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"                         | - 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"  |
| - 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"                     | - 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "                       |
| - 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area" | - 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area" |
| - 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"    | - 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"                             |
| - 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"                             | - 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"                             |
| - 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"                             | - 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"                          |
| - 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"                          | - 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"                             |

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.13R, Rev. 0, "SB (Zone 4) CO2 Puff Test"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.4 - Single active failure

**Compliance Basis:**

This area is not required to be protected by both primary and backup gaseous fire suppression systems. Therefore, a single active failure or a crack in the CO2 fire suppression system piping will not impair the backup fire suppression capability provided by water hose stations and fire extinguishers.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"
- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"
- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "
- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"
- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"
- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.5 - Disarming automatic system

**Compliance Basis:**

Each CO2 zone (system) is provided with a lockout switch located adjacent to, but outside of, the protected zone which can be used to prevent the discharge of CO2 when workers are in that zone. The key locked switch is under strict administrative control.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"
- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"
- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"
- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"
- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "
- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"
- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"
- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- FPSSR, Add. 31, "BV2 Fire Protection Safe Shutdown Report"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

- UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

**Open Items and VFDRs**

-None

## Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet

### Fire Protection Features

#### Transition Report

#### NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Beaver Valley Unit 2

Fire Compartment - 2-SB-3

Compliance Statement: Complies

#### Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Gaseous Suppression

SubSection: 3.10.6 - Occupied areas

#### Compliance Basis:

This room is not normally occupied and access is through security doors accessed by card-reader. This ensures that entry to the area is only to perform a specific task in the area and for no other reason.

#### Licensing Actions

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

#### Supporting EEEEs

- None

#### References

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"
- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"
- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "
- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"
- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"
- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

#### Open Items and VFDRs

- None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-SB-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.7 - Audible alarm

**Compliance Basis:**

CO2 discharge will occur after a pre-discharge time delay of approximately 60 seconds, during which alarm horns and revolving red lights warn any personnel in the hazard area to evacuate. The system is also provided with an odorizer.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-RM-0433-002A, Rev. 17, "Valve Oper No Diagram CO2 FP System"
- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"
- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"
- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"
- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "
- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"
- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"
- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.13R, Rev. 0, "SB (Zone 4) CO2 Puff Test"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:** Will Comply with the Use of Commitment

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.8 - Lock out

**Compliance Basis:**

An individual manual shut-off valve is not provided for each of the BV2 total flooding carbon dioxide extinguishing systems to provide positive mechanical means to lockout that system. The entire BV2 CO2 system can be positively mechanically locked out, or isolated, by closing, or ensuring closed, the three main manual valves at the discharge outlet of the three CO2 storage tanks, and also the small bypass valve around each of these three mainline valves. This arrangement is expected to be corrected by adding an individual shut-off valve (see Attachment S for more detail), but for now compliance is achieved through the single manual isolation valve for all connected systems.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**References**

- 10080-RB-0090B, Rev. 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System SH-2"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.9, Rev. 15, "CO2 Fire Protection System Inspection"

**Supporting EEEEs**

- None

- 10080-RM-0433-002A, Rev. 17, "VALVE OPER NO DIAGRAM - CO2 FIRE PROTECTION SYSTEM"
- 2OM-33.4.W, Rev. 20, "Local CO2 Control Panel Lockout"

**Open Items and VFDRs**

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**VFDR Number**      BV2-0406      CO2 Fire Suppression System Lacks Local Isolation Valves

The current BVPS automatic CO2 fire suppression systems are not in conformance with NFPA 805, Section 3.10.8. It has been decided that a modification will be completed to make the system conform to NFPA 805 requirements. This may challenge the Nuclear Safety Performance Criteria (NSPC) for Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring, depending on the equipment in the protected area. This is a code conformance issue.

Component ID:  
NA

**Disposition**

This VFDR will be corrected by a plant modification.

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment** - 2-SB-3

**Compliance Statement:** Complies

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.9 - Secondary thermal shock

**Compliance Basis:**

The possibility of secondary thermal shock (cooling) damage is considered credible only to electrical components and cable. Typically, cable trays are located more than 4 feet below the nozzles, with a small number being approximately 3 feet or less below the ceiling. Due to the geometry of the area, there are locations where there is nothing of significance close to the CO2 nozzles and locations where trays are in relatively close proximity to the nozzles. A number of cable trays in this area are covered, further shielding those cables from the impingement and thermal effects of a CO2 discharge. Electrical equipment is located closer to the floor below the cable trays. Adequate spacing between the CO2 nozzles and adjacent equipment provides reasonable assurance that the CO2 system design would minimize any impingement or thermal effects on components.

**Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- None

**References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-RM-0433-002A, Rev. 17, "Valve Oper No Diagram CO2 FP System"
- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"
- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"
- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 2OM-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "
- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"
- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"
- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 2OM-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 2OST-33.13R, Rev. 0, "SB (Zone 4) CO2 Puff Test"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"



**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Open Items and VFDRs**

-None

# **Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet** **Fire Protection Features** **Transition Report**

## **NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:** Complies

### **Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Gaseous Suppression

**SubSection:** 3.10.10 - Corrosive characteristics

### **Compliance Basis:**

Based on NFPA 12 and the Fire Protection Handbook carbon dioxide is a very inert extinguishing agent that effectively extinguishes a fire with a minimum of concern for decomposition products, especially in the subject nuclear plant environment. The corrosive characteristics of agent decomposition products is expected to be of very minor concern and acceptable.

### **Licensing Actions**

- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

### **References**

- 10080-E-10M, Rev. 21, "Window Arrangement - Annunciator A11"
- 10080-RA-0001D, Sht. 2, Rev. 12, "Floor Plan - Service Building"
- 10080-RE-0034W, Sht. 1, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-01, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-03, Rev. 5, "FP - CO2 system 2 Zone 4"
- 10080-TLD-33A-023-01, Rev. 4, "FP - CO2 system 2 Zone 4 FD"
- 10080-TLD-33A-023-03, Rev. 5, "FP - CO2 System 2 Zone 4"
- 2BVS-174, Rev. Final, "Spec. for Low Pressure Carbon Dioxide and Halon Fire Protection Systems"
- 20M-33.4.T, Rev. 3, "MAIN PLT CO2 HALON "
- 87-12-31, "DLC Letter, Carbon Dioxide Fire Suppression System Acceptance Testing"
- B-183, Rev. 0, "CO2 Excess Pressure on Enclosure due to CO2 Release and Required Vent Area"

### **Supporting EEEEs**

- None

- 10080-LSK-20-2E, Rev. 11, "Logic Diagram - CO2 Fire Protection System - Unit No. 2"
- 10080-RB-0090B, Rev. 21, "Flow Diagram FP & Smoke Det System "
- 10080-RE-0034X, Sht. 2, Rev. 8, "Cable Tray Arrangement - Svce Bldg Cable Tray Area"
- 10080-TLD-33A-021-02, Rev. 4, "FP - CO2 System 2 Zone 4"
- 10080-TLD-33A-021-04, Rev. 4, "FP - CO2 system 2 zone 4"
- 10080-TLD-33A-023-02, Rev. 5, "FP - CO2 System 2 Zone 4 FD"
- 2710.180-174-040, Rev. A, "CALC CO2 SYSTEM 2 ZONE 4 SERVICE BUILDING CAB SPRDG"
- 2DBD-33B, Rev. 10, "Fire Protection System"
- 20M-33.4.W, Rev. 20, "Local CO2 control Panel Lockout"
- 87-9-30, "DLC Letter 2NRC-7-205, Carbon Dioxide Fire Suppression System Acceptance Testing"
- SOV 2.33A.01, Rev. 0, "Main Plant Carbon Dioxide System Test (Fire Protection)"

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
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**Beaver Valley Unit 2**

**Open Items and VFDRs**

-None

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**Fire Compartment - 2-SB-3**

**Compliance Statement:** Complies by Previous Approval  
Complies with use of EEEE

**Post-Transition Methods:**

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Fire Protection Features Form:** Passive Protection

**SubSection:** 3.11.2 - Fire barriers

**Compliance Basis:**

The floor, walls and ceiling of SB-3 are concrete and vary from 1 to 2 ft. thick thereby providing a fire rating of 3 hr. except as discussed in the following.

Complies by Prior Approval

Ductwork passing through this area has been wrapped with a 1 hour fire rated material. All penetrations of walls and floor are sealed with a material having a rating equivalent to the barrier rating. A deviation for fire damper modifications has been documented in Appendix 9.5A of the UFSAR. The SSER states fire wrap is an acceptable deviation.

Complies with use of EEEE

Evaluation DEC-0184 evaluates the acceptability of 3M Interam E-50 series blanket assemblies that provide a one hour fire resistance for the ductwork use during a fire for ventilation and a 2 hour fire resistance for the protection of the 1-½ hour fire dampers.

The analysis, DEC-0190, performs an evaluation to determine the ability of the installed Thermo-Lag fire barrier configurations to have a one hour fire rating level of safety equivalent to 1 hour for baseline and upgraded junction boxes in various fire areas.

This analysis, DEC-0196, provides a justification that fire wrapping of the exposed 2 inch portion of the fire damper frame is not required to justify the damper rating thus enabling the combustible fire loading in 2-SB-3 to increase to 1 hour.

**Licensing Actions**

- 03 Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3)
- 04 Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)
- 05 Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork One-Hour Fire Wrap - BTP C.5.a(4)
- 06 Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

**Supporting EEEEs**

- 10080-DEC-0184 R1 A0
- 10080-DEC-0190 R1 A0
- 10080-DEC-0196 R1 A0

**References**

- 20ST-33.35, Rev. 2, "Fire Rated Assemblies Visual Inspection"
- 87-05-05, "BV2 SSER "

**Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet**  
**Fire Protection Features**  
**Transition Report**

**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**

**Beaver Valley Unit 2**

**References**

- BVPS-2 UFSAR, Rev. 19, "BVPS-2 Updated Final Safety Analysis Report"

- FPSSR, Add. 36, "BVPS-2 Fire Protection Safe Shutdown Report"

**Open Items and VFDRs**

-None