Enclosure B
L-17-122

LAR Attachment K – Existing Licensing Action Transition
(195 pages follow)

K. Existing Licensing Action Transition

194 Pages Attached

BVPS-1

Licensing Action #: 11.01

Licensing Action: Control Room (1-CR-1) - Lack of Automatic Suppression (III.G.3 criteria)

Basis Date: March 14, 1983

To Be Transitioned?: No

Basis:

III.G.3 requires that alternate or dedicated shutdown capability and its associated circuits shall be provided where protection of redundant trains required for hot shutdown does not satisfy the requirements of III.G.2. In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration. Control Room (1-CR-1) does not comply with Section III.G.3 because it is not provided with an automatic suppression system.

Exemption request transmitted by BVPS letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, December 10, 1982, and December 21, 1982, provided the justification for lack of automatic fire suppression required by Appendix R, Section III.G.3. The exemption approval was provided by NRC in SER's dated January 5, 1983 and March 14, 1983.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the control room:

- The Control Room is separated from other plant compartments by 3-hour rated fire barriers.* [see updated Exemption 11.18 for fire doors, and Exemption 11.21 for interconnecting ventilation]
- The licensee has permanently installed and hardwired a backup instrumentation panel for one train of equipment. The new backup indicating panel (BIP) is electrically isolated from the control room.
- The control room is equipped with area fire detectors.
- The control room is provided with both a hose station and fire extinguishers for manual fire fighting.
- The fire load in the area is low.
- Plant technical specifications require continuous occupancy of the control room by the operators. Because the operators constitute a continuous fire watch, manual fire suppression in event of a fire would be prompt and effective.

*Information relative to separation from adjacent fire compartments by 3-hour rated fire barriers was updated by later submittals (BVPS submittal dated January 14, 1985 and NRC SER dated December 4, 1986). Exemption 11.18 identified deficiencies with fire doors which were subsequently determined acceptable by the NRC. Exemption 11.21 identified interconnecting ventilation between the control room and the HVAC room (fire compartment 1-CR-2) without adequate fire-rated dampers, and was subsequently determined acceptable by the NRC.

BVPS-1

Licensing Action #: 11.01

Licensing Action: Control Room (1-CR-1) - Lack of Automatic Suppression (III.G.3 criteria)

Evaluation:

The NRC SER dated January 5, 1983 stated:

By submittals dated June 30, October 22 and October 28, 1982 the Licensee described the means by which safe shutdown can be achieved in the event of fire, and proposed modifications to the Beaver Valley Nuclear Power Station Unit 1 to meet the requirements of Appendix R to 10 CFR 50, Items III.G.3 and III.L. Additional information and clarification was obtained through a meeting held on November 30, 1982 and through telephone conference calls on December 6 and 9, 1982. The licensee subsequently documented his response in Letters dated December 10 and 21, 1982.

The licensee has provided safe shutdown analyses for the fire events and has demonstrated adequate redundancy in the proposed design of the Beaver Valley Nuclear Power Station Unit 1. The proposed modifications resolve previous SER open items on alternate shutdown.

The NRC SER dated March 14, 1983 stated:

The fire protection features currently installed in the control room and the continuous manning of the control room provide adequate defense-in-depth fire fighting capability for these areas. The control room is equipped with area fire detectors. The control room is provided with both a hose station and fire extinguishers for manual fire fighting. The fire load in the area is low.

In addition, the new proposed backup indicating panel is an alternate shutdown system which provides remote control capabilities for those systems necessary to maintain safe-shutdown capability from outside the main control room.

Plant Technical Specifications require continuous occupancy of the control room by the operators. Because the operators constitute a continuous fire watch, manual fire suppression in event of a fire would be prompt and effective and, thus, a fixed suppression system is not necessary to achieve adequate fire protection in this area.

Based on the above evaluation, the existing fire protection program for the control room provides a level-of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

In conclusion, the SER stated:

The Control Room is separated from other plant areas by three-hour rated fire barriers, is manned continuously, has low combustible loading, and is equipped with fire detectors and portable fire extinguishers. A remote emergency auxiliary shutdown panel and a backup instrument panel are provided away from the control room. An exemption from Subsection III.G.3.b is granted to the extent that an automatic suppression system is not needed.

BVPS-1

Licensing Action #: 11.01

Licensing Action: Control Room (1-CR-1) - Lack of Automatic Suppression (III.G.3 criteria)

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 82-10-22, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 82-10-28, "Supplemental Information to Fire Protection - Appendix R Review Report: Allowable Time to Achieve Cold Shutdown."
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 85-01-14, "Appendix R - Additional Exemption Requests."
- TER-12661, Revision 0, "Appendix R Report Update for CR971034."

Associations:

None

BVPS-1

Licensing Action #: 11.02

Licensing Action: Reactor Containment (1-RC-1) - Lack of 20 foot Separation (III.G.2 criteria)

Basis Date: March 14, 1983

To Be Transitioned?: Yes

Basis:

Reactor Containment (1-RC-1) does not comply with III.G.2, which requires that redundant trains of safe shutdown cables and equipment inside non-inerted containments be separated by 20 feet with no intervening combustible materials or fire hazards, or separated by noncombustible radiant energy shields, or an automatic suppression and detection system must be installed in the compartment. The following safe shutdown circuits inside containment were identified:

- Pressurizer PORVs (PCV-RC-455C, -D, and -456 and SOV-RC-544)
- Pressurizer Relief Blocking Valves (MOV-RC-535, -536, -537)
- Pressurizer heaters A, B, D, and E
- Steam Generator Level (LT-FW-474, -475, -476, -477, -484, -485, -486, -487, -494, -495, -496, -497)
- Pressurizer Level (LT-RC-459 and -460)
- Reactor Coolant Hot and Cold Leg Temperature (TRB-RC-410, -420, -430, -413, -423, -433)
- Reactor Coolant Gas Ventilation Solenoids

Exemption request transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, December 16, 1983, and January 14, 1985, provided the justification for lack of 20 foot separation free of intervening combustibles between redundant trains required by Appendix R, Section III.G.2.

The exemption approval was provided by NRC in SER dated March 14, 1983.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Reactor Containment:

- Due to the configuration and location within the containment and to the restricted access of these sub-areas during plant operations, an exposure fire is unlikely.
- All cable insulation is qualified to a test comparable to IEEE standard 383 and routed in conduit.*
- The reactor coolant pump is fitted with an oil collection system.
- Smoke detection and water deluge systems are provided in the cable penetration area and the RHR pump area.
- Portable fire extinguishers and manual hose stations are provided throughout the area.

BVPS-1

Licensing Action #: 11.02

Licensing Action: Reactor Containment (1-RC-1) - Lack of 20 foot Separation (III.G.2 criteria)

- Pressurizer PORV cables are run in conduit inside the crane wall, are 20 feet above the floor outside the crane wall, and are separated by 25' at the penetration area.
- Pressurizer PORV blocking valve power cables are run in conduit approximately 20 feet above the floor to the penetration area where they are separated by a fire barrier and automatic suppression and detection system.
- Pressurizer heater power cables are in covered horizontal trays 20 feet above the floor, and in vertical trays separated by 18'.
- Steam generator level channels are protected by suppression and detection in the penetration area and routed in conduit elsewhere. Conduits for Channels I and III are routed in opposite directions than Channel II around the Containment.
- Pressurizer level transmitter cables are enclosed in conduit where they are in close proximity. In the penetration area they are separated by a fire barrier and protected by a fire detection and suppression system.
- Reactor coolant hot and cold leg temperature channels I and II are in separate conduit and approach the penetration area from different directions. Neutral temperature indication from the bypass manifold is routed in conduit to the penetration area.

*Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").

Evaluation:

NRC SER dated March 14, 1983 details the safe shutdown equipment and the combustible loading inside containment. The SER states:

> *The redundant trains of safe shutdown components in this area include the containment ventilation, pressurizer pressure controls, pressurizer power operated relief valves, pressurizer relief blocking valves, pressurizer heaters, steam generator level transmitters, pressurizer level transmitters, reactor coolant hot and cold leg temperature instrumentation, pressurizer and reactor vessel vents, and associated cables.*

The SER also states:

> *All cable insulation is qualified to a test comparable to IEEE Standard 383. The reactor coolant pumps are fitted with an oil collection system.*
>
> *Smoke detection systems and water deluge systems are provided only in the cable penetration area and in the residual heat removal pump area.*
>
> *Portable fire extinguishers and manual hose stations are provided throughout the fire area.*

BVPS-1

Licensing Action #: 11.02

Licensing Action: Reactor Containment (1-RC-1) - Lack of 20 foot Separation (III.G.2 criteria)

The NRC SER continues with descriptions of the location and separation of redundant cables of equipment as follows:

1. *Pressurizer Power Operated Relief Valves*
2. *Pressurizer Relief Blocking Valves*
3. *Pressurizer Heaters*
4. *Steam Generator Level*
5. *Pressurizer Level Transmitters*
6. *Reactor Coolant Hot and Cold Leg Temperature*

NRC SER further states:

The protection for redundant trains of safe shutdown equipment inside containment does not meet the technical requirements of Section III.G because there is not twenty feet of separation between redundant power cables free of intervening combustibles. Due to their configuration and location within the containment and to the restricted access of these sub-areas during plant operations, an exposure fire involving the accumulation of significant quantities of transient combustible materials is unlikely. Because there are only a few cables in these sub-areas and all cables inside containment are qualified to a test comparable to that of IEEE Standard 383 and routed in conduit, a fire of sufficient magnitude to damage redundant cables or components is also unlikely.

Based on the above evaluation, the existing protection for the containment area provides a level of fire protection equivalent to the technical requirements of Section III.G of Appendix R. Therefore, the exemption should be granted.

Validation/Conclusions:

Conformance with the Appendix R exemption bases reached with the NRC regarding Reactor Containment (1-RC-1); lack of 20 foot separation (III.G.2 criteria) as stated in the NRC SER dated March 14, 1983, was verified. Safety-related cables used in the plant were procured using specifications that required the use of fire retardant cable material, thermo-set, in the manufacture of the cables for safety-related applications. Fire performance of the thermo-set material was tested using a flame test that preceded IEEE 383-1974 and, at the time of the exemption approval, was considered an equivalent fire test to that required by IEEE 383.

The exemption for the Reactor Containment (1-RC-1) is being transitioned to the new licensing basis under NFPA 805.

Disposition:

Licensing Action acceptable for transition

BVPS-1

Licensing Action #: 11.02

Licensing Action: Reactor Containment (1-RC-1) - Lack of 20 foot Separation (III.G.2 criteria)

References:

- 1OST-33.21, Revision 7, "Containment Fire Protection System Refueling Outage Test."
- 1OST-33.21A, Revision 8, "Containment Area Smoke Detection Instrumentation Test."
- 1PFP-RCBX-692, Revision 1, "Reactor Containment Building Fire Area RC-1."
- 1PFP-RCBX-718, Revision 1, "Reactor Containment Building Fire Area RC-1."
- 1PFP-RCBX-738, Revision 1, "Reactor Containment Building Fire Area RC-1."
- 1PFP-RCBX-767, Revision 1, "Reactor Containment Building Fire Area RC-1."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 85-01-14, "Appendix R - Additional Exemption Requests."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 82-10-22, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 8700-B-084, Revision 12, "Fire Hazards Analysis."
- 8700-RB-0140A, Revision 3, "Oil Collection System for Reactor Coolant Pump."
- 8700-RE-0004F, Revision 11, "External Connections Instrument XMTR Racks 11 to 116."
- 8700-RE-0004K, Sheet 2, Revision 30, "External Connections Miscellaneous Instruments."
- 8700-RE-0004L, Sheet 3, Revision 30, "External Connections Miscellaneous Instruments."
- 8700-RE-0018A, Revision 9, "Wiring Diagram Pressurized Heater Distribution Panels."
- 8700-RE-0034AF, Revision 11, "Cable Tray Designations Reactor Containment 767'-10"."
- 8700-RE-0034AG, Revision 9, "Cable Tray Designations Reactor Containment 738'-10"."

BVPS-1

Licensing Action #: 11.02

Licensing Action: Reactor Containment (1-RC-1) - Lack of 20 foot Separation (III.G.2 criteria)

- 8700-RE-0034AK, Sheet 1, Revision 9, "Cable Tray Section Designations Reactor Containment."
- 8700-RE-0034AX, Revision 7, "Cable Tray Designation Containment & CV 735'-6"."
- 8700-RE-0034AY, Revision 7, "Cable Tray Section Designations Reactor Containment."
- 8700-RE-0034G, Revision 10, "CH Cable Tray Plan Reactor Containment 738'-10" N."
- 8700-RE-0035B, Revision 7, "Electrical Penetration Terminal Boxes Reactor Containment."
- 8700-RE-0037BD, Revision 7, "Sleeve Designations Reactor Containment."
- 8700-RE-0046A, Revision 13, "Conduit Plan Reactor Containment 767'-10"."
- 8700-RE-0057Q, Revision 13, "Instrumentation Conduit Reactor Containment 692'-11" N."
- 8700-RE-0057R, Revision 14, "Instrumentation Conduit Reactor Containment 692'-11" S."
- 8700-RE-0057S, Revision 12, "Instrumentation Conduit-Reactor Containment 718'-6" N."
- 8700-RE-0057T, Revision 10, "Instrumentation Conduit Reactor Containment 718'-6" S."
- 8700-RE-0057U, Revision 16, "Instrumentation Conduit Reactor Containment 738'-10" N."
- 8700-RM-0433-002, Revision 19, "Valve Operation Number Diagram Fire Protection Water."
- 8700-RM-0433-008, Revision 13, "Valve Operation Number Diagram Fire Protection Details."
- DCP-0194, Revision 1, "Oil Collection System for Reactor Coolant Pump."
- ECP 07-0044-28, Revision 0, "Replace the Conduit Seals on Barton EQ Transmitters in Containment."
- ECP 07-0044-29, Revision 0, "Replace the Conduit Seals on Barton EQ Transmitters in Containment."
- ECP 07-0044-RD, Revision 1, "Replace the Conduit Seals on Barton EQ Transmitters in Containment."

BVPS-1

Licensing Action #: 11.02

Licensing Action: Reactor Containment (1-RC-1) - Lack of 20 foot Separation (III.G.2 criteria)

- NOP-CC-2003, Revision 17, "Engineering Changes."
- NOP-CC-2004, Revision 10, "Design Interface Reviews and Evaluations."
- TER-06263, Revision 0, "Evaluate Drawing Errors Found while Working with DCP's 1731 & 1755."
- TER-12661, Revision 0, "Appendix R Report Update for CR971034."
- UFPARR, Revision 30, "Updated Fire Protection Appendix R Review."

Associations:

Ch.4 - Compartment: 1-RC-1
Fire Protection - Fire Compartment: 1-RC-1 / Form: Detection
Fire Protection - Fire Compartment: 1-RC-1 / Form: Water-Based Suppression

BVPS-1

Licensing Action #: 11.03

Licensing Action: Blender Room (1-PA-1G) - Lack of 20 foot Separation and Automatic Suppression and Detection (III.G.2 criteria)

Basis Date: March 14, 1983

To Be Transitioned?: No

Basis:

This compartment does not comply with Section III.G.2 because the separation is less than 20 feet between redundant trains of safe shutdown equipment, the compartment is not provided with an automatic suppression system and it does not have fire detection coverage throughout the fire compartment.

The potentially affected safe shutdown equipment from a fire in the Blender Room located in Auxiliary Building, Elevation 722'-6" (1-PA-1G) is MOV-CH-115B & 115D (RWST Discharge to Charging Pump Suction Valves).

Exemption request transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, and December 21, 1982, provided the justification for lack of 20 foot separation with no automatic suppression system and lack of full area fire detection coverage required by Appendix R, Section III.G.2 for fire compartment 1-PA-1G. BVPS-1 letter dated December 21, 1982 addressed the commitment to fire wrap charging pump power cables with a 1-hour fire barrier, and the use of low head safety injection (LHSI) pumps as an alternative charging pump suction flow path in the event a fire affects the normal flow path via the RWST Discharge to Charging Pump Suction Valves (MOV-CH-115B & 115D).

The exemption approval was provided by NRC in SER dated March 14, 1983.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Blender Room located in Auxiliary Building, Elevation 722'-6" (1-PA-1G):

- Low combustible loading.
- Partial height walls separating the charging pumps.
- 1-hour fire barrier on charging pump power cables.
- Smoke detectors in the vicinity of the pumps.
- Use of alternate charging suction flow path through the low head safety injection pumps.

Evaluation:

Regarding the Primary Auxiliary Building - 1-PA-1G, the NRC SER dated March 14, 1983 states:

> *This area does not comply with Section III.G.2.b because an automatic suppression system is not provided. Because the combustible loading is low, partial height walls between the charging pumps and one-hour barriers and smoke detectors are provided these alternative features will provide reasonable assurance that one train of charging pumps will be maintained free of fire damage for a sufficient period to*

BVPS-1

Licensing Action #: 11.03

Licensing Action: Blender Room (1-PA-1G) - Lack of 20 foot Separation and Automatic Suppression and Detection (III.G.2 criteria)

enable the fire brigade to respond and manually extinguish a fire. This exemption is granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 1OST-33.16, Revision 14, "Smoke Detector Instrumentation Test."
- 1OST-33.35, Revision 0, "Fire Rated Assemblies Visual Inspection."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."
- UFSAR, Revision 29, "Beaver Valley Power Station Unit 1 Updated Final Safety Analysis Report."

Associations:

None

BVPS-1

Licensing Action #: 11.04

Licensing Action: Pipe Tunnel (1-PT-1) - Lack of 20 foot Separation and Automatic Suppression and Detection (III.G.2 criteria)

Basis Date: March 14, 1983

To Be Transitioned?: No

Basis:

This compartment does not comply with Section III.G.2 because the equipment and cabling of interest (TV-CC-110E2, F2, TV-CC-110F1) are not physically separated or protected with fire barriers or suppression and detection systems. TV-CC-110E2, F1, F2 are functionally associated with backup cooling to the containment air recirculation coils.

NOTE: This exemption specifically addressed the physical separation of equipment and cables for component cooling to RHR valves on Elevation 722'-6" of the pipe tunnel. The potentially affected safe shutdown equipment was related to the Containment Air Cooling System, which was deleted from the safe shutdown equipment list via BVPS clarification letter to the NRC dated January 14, 1985. Since these circuits of interest are no longer considered necessary for post-fire safe shutdown, the exemption request no longer applies.

The potentially affected safe shutdown equipment from a fire in the Pipe Tunnel, Elevation 722'-6" (1-PT-1) was previously identified as TV-CC-110E2, F2, TV-CC-110F1 (backup cooling to the containment air recirculation coils).

Exemption request transmitted by BVPS-1 letter dated June 30, 1982 provided the justification for lack of 20 foot separation with no automatic suppression system and lack of full area fire detection coverage required by Appendix R, Section III.G.2 for fire compartment 1-PT-1.

The exemption approval was provided by NRC in SER dated March 14, 1983.

NOTE: BVPS-1 letter to the NRC dated January 14, 1985 provided clarification for the components associated with backup cooling to the containment air recirculation coils, which negated the need for this exemption.

The following condition was cited in the NRC SER as the bases for the exemption approval relative to the Pipe Tunnel, Elevation 722'-6" (1-PT-1): If a fire occurs, there is approximately 0.5 hour to manually operate the valves for containment air cooling. Because of the time available to take manual control of the backup system, there is reasonable assurance that one train of components will be available for cooling the containment air recirculation coils.

Evaluation:

Regarding the Pipe Tunnel, the NRC SER dated March 14, 1983 states:

> *This area is not provided with an automatic suppression system and 20 feet of separation free of intervening combustibles between redundant components of alternative shutdown capability. If a fire did occur, there is approximately 1/2-hour to manually operate the necessary valves if a loss of offsite power occurs; if such a loss does not occur these valves would remain operable. Because of the time available to take manual control of the backup system, there is reasonable*

BVPS-1

Licensing Action #: 11.04

Licensing Action: Pipe Tunnel (1-PT-1) - Lack of 20 foot Separation and Automatic Suppression and Detection (III.G.2 criteria)

assurance that one train of components will be available for cooling the containment air recirculation coils. This exemption to Subsection III.G.2.b is granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 85-01-14, "Appendix R - Additional Exemption Requests."

Associations:

None

BVPS-1

Licensing Action #: 11.05

Licensing Action: Cable Tunnel (1-CV-3) - Lack of 20 foot Separation (III.G.2 criteria)

Basis Date: March 14, 1983

To Be Transitioned?: Yes

Basis:

This compartment does not comply with Section III.G.2 because the separation is less than 20 feet between redundant trains of safe shutdown equipment, and the compartment is not provided with an automatic suppression system.

The cable tunnel functions primarily as a transition area for cables routed from the service building to the electrical underground ductbanks in the north yard. The redundant cables routed within the tunnel area include the Class 1E power and control cable associated with the river water pumps, the essential support equipment located in the intake structure, the alternate intake structure, and the emergency diesel generators.

Exemption request transmitted by BVPS-1 letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, October 28, 1982, and December 21, 1982, provided the justification for lack of 20 foot separation with no automatic suppression system required by Appendix R, Section III.G.2 for fire compartment 1-CV-3. In addition, the licensee committed to install a total flooding Halon 1301 system in fire compartment 1-CV-3.

The exemption approval was provided by NRC in SER dated March 14, 1983.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Cable Tunnel (1-CV-3):

- All cables are qualified to a test comparable to IEEE standard 383.*
- Each redundant function has at least one train of cables installed in conduit.
- Access to the area is restricted.
- A smoke detection system is provided in the Cable Tunnel (1-CV-3).
- The licensee proposes to install a total flooding Halon 1301 system.
- The restricted access minimizes the possibility of a severe exposure fire due to accumulated transient combustibles.
- The metal conduit will delay the onset of cable damage for a limited time period for small exposure fires.
- The Halon system should promptly extinguish a fire.
- Low in-situ combustibles.

Among the conditions cited in the NRC SER dated March 14, 1983, that requires clarification relative to qualification of cables is that "all" cables are qualified to a test comparable to that of IEEE Standard 383 and are routed in conduit. The statement was applicable to the cable jacket flame retardancy testing and qualifications relative to fire protection for safety-related applications.

BVPS-1

Licensing Action #: 11.05

Licensing Action: Cable Tunnel (1-CV-3) - Lack of 20 foot Separation (III.G.2 criteria)

SER dated June 6, 1979, stated, "We find that retest of cables to IEEE-383 Standard would not provide information that would change our recommendation or conclusions. Accordingly, we find the safety-related electrical cables used at Beaver Valley Power Station, Unit 1, acceptable."

~~*Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

FPE RAI 04

Evaluation:

The NRC SER dated March 14, 1983 states:

All cables are qualified to a test comparable to IEEE Standard 383. Each redundant function has at least one train of cables installed in conduit. Access to the area is restricted via a metal hatch and vertical ladder. A smoke detection system is provided in the cable tunnel.

The licensee proposes to install a total flooding Halon 1301 system.

The licensee states that restricted access to the area minimizes the potential for the accumulation of transient combustible materials, and that one train of cables for each redundant function is routed in conduit, therefore, the probability of both trains sustaining fire damage from an exposure fire is reduced to a level equivalent to that provided by the protective features of Section III.G.

This fire area with the proposed modifications does not comply with the technical requirement of Section III.G.

The 1-hour rated fire barrier or twenty feet of separation free of intervening combustibles required by Section III.G provides the benefit of a protective feature to prevent cable damage until the automatic suppression system extinguishes the fire. In this fire area, the restricted access minimizes the probability of a severe exposure fire due to accumulated transient combustibles. In addition, the metal conduit will delay the onset of cable damage for a limited time period for small exposure fires. The proposed Halon 1301 system should promptly extinguish a fire in this area. Because of the restricted access, low in-situ combustibles and automatic suppression, there is reasonable assurance that one train of cables will remain free of fire damage.

Based on our evaluation, the level of existing protection in cable tunnel CV-3 in conjunction with the proposed Halon 1301 system provides a level of fire protection equivalent to the technical requirements of Section III.G of Appendix R. Therefore, the exemption should be granted.

And, in summary:

Subsection III.G.2.b requires 20 feet of separation free of intervening combustibles between cables. Based on our evaluation, the level of existing protection in cable tunnel CV-3 in conjunction with the proposed Halon 1301 system provides a level of

BVPS-1

Licensing Action #: 11.05

Licensing Action: Cable Tunnel (1-CV-3) - Lack of 20 foot Separation (III.G.2 criteria)

fire protection equivalent to the technical requirements of Section III.G of Appendix R. Therefore, the exemption is granted.

Validation/Conclusions:

Conformance with the Appendix R exemption bases reached with the NRC regarding the Cable Tunnel (1-CV-3); lack of 20 foot separation (III.G.2 criteria) as stated in the NRC SERs dated March 14, 1983 was verified. Gaseous suppression (Halon) is available to meet the performance-based analysis and is allowed by NFPA 805. The exemption for lack of 20 foot separation for the Cable Tunnel (1-CV-3) is being transitioned to the new licensing basis under NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 82-10-22, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 82-10-28, "Supplemental Information to Fire Protection - Appendix R Review Report: Allowable Time to Achieve Cold Shutdown."
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- FPPCE 11-027, Revision 0, "Engineering Evaluation of Enclosed Cable Trays within CV-3." SSD RAI 13(f)
- UFPARR, Revision 30, "Updated Fire Protection Appendix R Review."

Associations:

Ch.4 - Compartment: 1-CV-3
Fire Protection - Fire Compartment: 1-CV-3 / Form: Detection
~~Fire Protection - Fire Compartment: 1-CV-3 / Form: ERFBS~~ SSD RAI 13(f)
Fire Protection - Fire Compartment: 1-CV-3 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 1-CV-3 / Form: Passive Protection SSD RAI 13(f)

BVPS-1

Licensing Action #: 11.06

Licensing Action: Primary Auxiliary Building (1-PA-1G) - Lack of 20 foot Separation and Automatic Suppression and Detection (III.G.2 criteria)

Basis Date: March 14, 1983

To Be Transitioned?: No

Basis:

This compartment does not comply with Section III.G.2 because the separation is less than 20 feet between redundant trains of safe shutdown equipment, the compartment is not provided with an automatic suppression system, and it does not have fire detection coverage throughout the fire compartment.

The potentially affected safe shutdown equipment from a fire in the Primary Auxiliary Building; Elevation 722'-6" (1-PA-1G) is 1-PA-1GA, 1-PA-1GB, and 1-PA-1GC (High Head Safety Injection - Charging Pumps).

Exemption request transmitted by BVPS letter dated June 30, 1982, and supplemented by letters dated October 22, 1982, and December 21, 1982, provided the justification for lack of 20 foot separation with no automatic suppression system and lack of full area fire detection coverage required by Appendix R, Section III.G.2 for fire compartment 1-PA-1G. BVPS letter dated December 21, 1982, addressed the commitment to fire wrap charging pump power cables with a 1-hour fire barrier, the use of portable ventilation fans, and the use of the low head safety injection (LHSI) pumps as an alternative charging pump suction flow path in the event a fire affects the normal flow path via the RWST Discharge to Charging Pump Suction Valves (MOV-CH-115B & 115D).

The exemption approval was provided by NRC in SER dated March 14, 1983.

The following conditions were cited in the NRC SER dated March 14, 1983 as the bases for the exemption approval relative to the Primary Auxiliary Building, Elevation 722'-6" (1-PA-1G):

- Low combustible loading.
- Partial height walls separating the charging pumps.
- 1-hour fire barrier on charging pump power cables.
- Smoke detectors in the vicinity of the pumps.
- Use of alternate charging suction flow path through the low head safety injection pumps.

The following condition was cited in the NRC SER dated March 14, 1983, as the basis for use of portable ventilation for the Charging Pump Cubicles (PA-1f, 1g, & 1h). The licensee proposed the use of portable fans as a redundant means of supplying essential ventilation to the charging pump cubicles and emergency switchgear rooms. The NRC determined the use of portable gasoline powered ventilation fans for ventilation of the charging pump cubicles and emergency switchgear rooms was acceptable because the licensee demonstrated by analysis that there was a time period of approximately one to two hours

BVPS-1

Licensing Action #: 11.06

Licensing Action: Primary Auxiliary Building (1-PA-1G) - Lack of 20 foot Separation and Automatic Suppression and Detection (III.G.2 criteria)

during which these fans would not need to be employed. The NRC accepted the use of portable fans as backup HVAC equipment for these compartments.

In addition, the initial exemption request transmitted by BVPS letter to NRC dated June 30, 1982, and supplemented by letter dated October 22, 1982 proposed the installation of 1.5-hour fire dampers in common ductwork that penetrates the 3-hour-rated fire barriers for the Charging Pump Cubicles. The NRC SER dated March 14, 1983, did note that this does not comply with the Section III.G requirements for 3-hour-rated fire barriers between redundant components. The licensee did not formally request an exemption for this compartment; however, the NRC evaluated this proposal as such. The SER stated that because smoke detection, 1.5-hour rated fire dampers, and duct insulation are provided, there is reasonable assurance that a fire in one charging pump cubicle will be promptly detected and extinguished by the fire brigade before the redundant pumps are damaged. The NRC concluded that the licensee's proposed modification provides a level of fire protection equivalent to the technical requirements of Section III.G.2. This approval was documented in the SER dated March 14, 1983.

Evaluation:

Regarding the Primary Auxiliary Building (1-PA-1G), the NRC SER dated March 14, 1983 states:

> *This area does not comply with Section III.G.2.b because an automatic suppression system is not provided. Because the combustible loading is low, partial height walls between the charging pumps and one-hour barriers and smoke detectors are provided, these alternative features will provide reasonable assurance that one train of charging pumps will be maintained free of fire damage for a sufficient period to enable the fire brigade to respond and manually extinguish a fire. This exemption is granted.*

Regarding the HVAC Ductwork for the Charging Pump Cubicles (PA-1f, 1g, & 1h), it states:

> *The licensee has proposed to install 1 1/2-hour fire dampers in common ductwork that penetrates 3-hour-rated fire barriers.*
>
> *We note that this does not comply with the Section III.G requirements for 3-hour-rated fire barriers between redundant components. The licensee has not formally requested an exemption for this area, however, we have evaluated this proposal as such. Because smoke detection, 1 1/2-hour -rated fire dampers, and duct insulation are provided, there is reasonable assurance that a fire in one charging pump cubicle will be promptly detected and extinguished by the fire brigade before the redundant pumps are damaged. The licensee's proposed modification, therefore, provides a level of fire protection equivalent to the technical requirements of Section III.G.2.*
>
> *This exemption should be granted.*

BVPS-1

Licensing Action #: 11.06

Licensing Action: Primary Auxiliary Building (1-PA-1G) - Lack of 20 foot Separation and Automatic Suppression and Detection (III.G.2 criteria)

Regarding the Charging Pump Cubicles and Emergency Switchgear Rooms (portable ventilation), the SER states:

> *The licensee proposes to use portable gasoline-powered fans as a redundant means of supplying essential ventilation to the charging pump cubicles and the emergency switchgear rooms. The portable fans will be placed in position and operated by the plant fire brigade.*
>
> *These areas contain equipment essential for hot shutdown. Loss of their normal HVAC systems means that the temperature will rise rapidly, thus damaging or prematurely aging the equipment housed inside these areas. The proposed use of the gasoline-powered fans is considered a repair, which is not allowed by the requirement of III.G.1.a. Repairs which can be accomplished within 72 hours are permitted for cold-shutdown-related equipment. However, the licensee has shown, by analysis, that there is a time period of approximately 1 to 2 hours during which these fans would not need to be employed. Because of this time factor, we accept the use of portable fans as backup HVAC equipment for these areas.*
>
> *This exemption should be granted.*

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 1OST-33.16, Revision 14, "Smoke Detector Instrumentation Test."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 82-10-22, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."
- UFSAR, Revision 29, "BVPS-1 Updated Final Safety Analysis Report."

Associations:

None

BVPS-1

Licensing Action #: 11.07

Licensing Action: Primary Auxiliary Building (1-PA-1A) - Lack of Automatic Suppression and Detection (III.G.3 criteria)

Basis Date: March 14, 1983, and August 30, 1984

To Be Transitioned?: No

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Primary Auxiliary Building (1-PA-1A), Elevation 768'-7" does not comply with Section III.G.3 because the compartment is not provided with automatic fire suppression and detection coverage. BVPS-1 letter dated December 16, 1983 (Attachment 1) requested an exemption from the requirement for fixed suppression and detection on Primary Auxiliary Building 768' floor level.

The potentially affected safe shutdown equipment from a fire in the Primary Auxiliary Building, Elevation 768'-7" (1-PA-1A) is the Ventilation Fans for the Charging Pump Cubicles.*

*Even though this fire compartment (1-PA-1A) does not contain safe shutdown cables/equipment, the ventilation exhaust fans (VS-F-7A and-7B, and VS-F-4A and 4B) located in fire compartment 1-PA-1G service the Charging Pump Cubicles (PA-1f, 1g, & 1h) located three floors below at elevation 722' in the Primary Auxiliary Building (PAB). The use of portable ventilation fans as a means of providing an alternate method for essential air flow to the Charging Pump Cubicles to ensure continued operation of the pumps was approved in NRC SER as an exemption per NRC letter dated March 14, 1983. However, since Appendix R requires fixed suppression and detection for the original area under consideration (in this case the PAB 768' floor level), an additional exemption request was initiated by BVPS-1 letter dated December 16, 1983, for the PAB elevation 768' floor level.

The exemption for the Primary Auxiliary Building (1-PA-1A), Elevation 768'-7" was approved and documented in NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Primary Auxiliary Building (1-PA-1A), Elevation 768'-7":

- Combustible loading is light.
- There is alternate shutdown capability.
- Detection and manual fire suppression equipment is available.

In addition, the following condition was cited in the NRC SER dated March 14, 1983, as the basis for use of portable ventilation for the Charging Pump Cubicles (PA-1f, 1g, & 1h):

The licensee proposed the use of portable fans as a redundant means of supplying essential ventilation to the charging pump cubicles and emergency switchgear rooms. The NRC determined the use of portable gasoline powered ventilation fans for ventilation of the charging pump cubicles and emergency switchgear rooms was acceptable because the licensee demonstrated by analysis that there was a time period of approximately one to two hours during which these fans would not need to be employed. The NRC accepted the use of portable fans as backup HVAC equipment for these compartments.

BVPS-1

Licensing Action #: 11.07

Licensing Action: Primary Auxiliary Building (1-PA-1A) - Lack of Automatic Suppression and Detection (III.G.3 criteria)

Evaluation:

The NRC SER dated August 30, 1984, states:

We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:

1. Fixed Suppression and Detection Systems

For the following areas, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:

Primary Auxiliary Building (1-PA-1A), Elev. 768

....

All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability, detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

Regarding portable ventilation, the NRC SER dated March 14, 1983 states:

7. Charging Pump Cubicle and Emergency Switchgear Room

The licensee proposes to use portable gasoline-powered fans as a redundant means of supplying essential ventilation to the charging pump cubicles and the emergency switchgear rooms. The portable fans will be placed in position and operated by the plant fire brigade.

These areas contain equipment essential for hot shutdown. Loss of their normal HVAC systems means that the temperature will rise rapidly, thus damaging or prematurely aging the equipment housed inside these areas. The proposed use of the gasoline-powered fans is considered a repair, which is not allowed by the requirement of III.G.1.a. Repairs which can be accomplished within 72 hours are permitted for cold-shutdown-related equipment. However, the licensee has shown, by analysis, that there is a time period of approximately 1 to 2 hours during which these fans would not need to be employed. Because of this time factor, we accept the use of portable fans as backup HVAC equipment for these areas.

This exemption should be granted.

BVPS-1

Licensing Action #: 11.07

Licensing Action: Primary Auxiliary Building (1-PA-1A) - Lack of Automatic Suppression and Detection (III.G.3 criteria)

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 1OST-33.1B, Revision 8, "Fire Protection System Water Flow & Drain Test."
- 1OST-33.15A, Revision 15, "Fire Extinguisher Monthly Inspection."
- 1OST-33.16, Revision 14, "Smoke Detector Instrumentation Test."
- 1OST-33.2A, Revision 4, "Fire Protection System Monthly Hose Stations Test."
- 1PFP-AXLB-768-Aux Building General Area, Revision 2, "Fire Area PA-1A."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."

Associations:

None

BVPS-1

Licensing Action #: 11.08

Licensing Action: Control Room HVAC Equipment Room (1-CR-2) - Lack of Automatic Suppression (III.G.3 criteria)

Basis Date: August 30, 1984

To Be Transitioned?: No

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Control Room HVAC Equipment Room (1-CR-2), Elevation 713' does not comply with Section III.G.3 because the compartment is not provided with fixed automatic fire suppression. BVPS-1 letter dated December 16, 1983, requested an exemption from the requirement for fixed automatic fire suppression for 1-CR-2. An exemption was also requested from the requirements of Section III.G.2 for 1-CR-2 because of a fire compartment boundary (fire door) with a rating less than three hours.

The potentially affected safe shutdown equipment from a fire in the Control Room HVAC Equipment Room (1-CR-2) is HVAC equipment for the Control Room.

The exemption for the Control Room HVAC Equipment Room (1-CR-2) was approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Control Room HVAC Equipment Room (1-CR-2):

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- Detection and manual fire suppression equipment is available.
- The fire door rating exceeds the loading on each side with considerable margin.

Evaluation:

The NRC SER dated August 30, 1984, states:

> *We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:*
>
> *1. Fixed Suppression and Detection Systems*
>
> *For the following areas, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:*
>
> *Control Room HVAC Equipment Room (1-CR-2), Elev. 713*
>
> ....
>
> *All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability, detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related*

equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

The NRC SER also states:

2. Control Room HVAC Equipment Room (CR-2), Elevation 713

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The control room HVAC equipment room is separated from other areas by 3-hour rated fire barriers with the exception of a 1 1/2-hour rated fire door which leads to the Relay Room (CR-3). The combustible loading in both areas (CR-3 and CR-2), if totally consumed, would correspond to an equivalent fire severity of approximately 40-50 minutes on the ASTM E-119 Standard Time-Temperature Curve. Smoke detection and manual fire suppression equipment is provided in each area. Alternate shutdown capability is provided independent of the fire area.

The 1 1/2-hour rated fire door which leads to the relay room exceeds the combustible loading in both the HVAC equipment room and the relay room with considerable margin. In the event a fire occurred in either room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the door's integrity is challenged. Replacing the existing door with a 3-hour rated assembly would not significantly enhance fire protection safety.

Based on our evaluation, we find that the existing fire door in the HVAC equipment room (CR-2) provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 1OST-33.15A, Revision 15, "Fire Extinguisher Monthly Inspection."
- 1OST-33.2A, Revision 4, "Fire Protection System Monthly Hose Stations Test."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."

BVPS-1

Licensing Action #: 11.08

Licensing Action: Control Room HVAC Equipment Room (1-CR-2) - Lack of Automatic Suppression (III.G.3 criteria)

- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1"
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."

Associations:

None

BVPS-1

Licensing Action #: 11.09

Licensing Action: 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)

Basis Date: March 14, 1983, and August 30, 1984

To Be Transitioned?: ~~Yes~~ No

FPE RAI 02 and SSD RAI 06

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Emergency Switchgear Rooms (1-ES-1 and 1-ES-2), Elevation 713' does not comply with Section III.G.3 because the compartment is not provided with fixed automatic fire suppression. BVPS-1 letter dated December 16, 1983 requested an exemption from the requirement for fixed automatic fire suppression for 1-ES-1 and 1-ES-2. An exemption was also requested from the requirements of Section III.G.2 for 1-ES-1 and 1-ES-2 because of fire barriers (ceiling and fire dampers) that have a fire rating of 1.5 hours (less than three hours).

The potentially affected safe shutdown equipment from a fire in the Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) is redundant safety-related 4-kV switchgear and 480-V substations located in each of these separate fire compartments (1-ES-1 & 1-ES-2) that supply power to Class 1E circuits required for safe shutdown.

The exemptions for the Emergency Switchgear Rooms (1-ES-1 and 1-ES-2) were approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Emergency Switchgear Rooms (1-ES-1 and 1-ES-2):

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- Detection and manual fire suppression equipment is available.
- The ceiling rating exceeds the combustible loading with considerable margin.

In addition, the following condition was cited in the NRC SER dated March 14, 1983 as the basis for use of portable ventilation for the Emergency Switchgear Rooms (1-ES-1 and 1-ES-2):

The BVPS-1 letter dated December 21, 1982, identified the use of portable fans as a redundant means of supplying essential ventilation to the charging pump cubicles and emergency switchgear rooms. The NRC determined the use of portable gasoline powered ventilation fans for ventilation of the charging pump cubicles and emergency switchgear rooms was acceptable because the licensee demonstrated by analysis that there was a time period of approximately one to two hours during which these fans would not need to be employed. The NRC accepted the use of portable fans as backup HVAC equipment for these compartments, and the exemption approval was provided by NRC in the SER dated March 14, 1983.

BVPS-1

Licensing Action #: 11.09

Licensing Action: 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)

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

SSD RAI 06

Evaluation:

The NRC SER dated August 30, 1984 states:

We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:

1. Fixed Suppression and Detection Systems

For the following area, an exemption was requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:

Emergency Switchgear Rooms (ES-1 & 2), Elev. 713

....

All of the fire areas for which exemptions have been requested represent a similar configuration, i.e. combustible loading is light, there is alternate shutdown capability, detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

Regarding the Emergency Switchgear Rooms, the NRC SER also states:

3. Emergency Switchgear Rooms (ES-1 and ES-2) Elevation 713:

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The Emergency Switchgear Rooms are located on the 713 elev. beneath the cable spreading room. The ceiling which forms a boundary between the two areas constitutes a 1 1/2-hour fire barrier. All other adjacent boundaries are 3-hour rated. 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.

Smoke detection and manual fire suppression equipment are provided in the area. The 1 1/2-hour rated ceiling exceeds the combustible loading in the switchgear room with considerable margin. In the event a fire occurred, there is reasonable

assurance that the installed smoke detection system would alarm and alert the fire brigade before the ceiling's integrity is challenged. Replacing the existing ceiling with 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we find 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.2. The exemption should, therefore, be granted.

Regarding portable ventilation, the NRC SER dated March 14, 1983, states:

7. Charging Pump Cubicle and Emergency Switchgear Room

The licensee proposes to use portable gasoline-powered fans as a redundant means of supplying essential ventilation to the charging pump cubicles and the emergency switchgear rooms. The portable fans will be placed in position and operated by the plant fire brigade.

These areas contain equipment essential for hot shutdown. Loss of their normal HVAC systems means that the temperature will rise rapidly, thus damaging or prematurely aging the equipment housed inside these areas. The proposed use of the gasoline-powered fans is considered a repair, which is not allowed by the requirement of III.G.1.a. Repairs which can be accomplished within 72 hours are permitted for cold-shutdown-related equipment. However, the licensee has shown, by analysis, that there is a time period of approximately 1 to 2 hours during which these fans would not need to be employed. Because of this time factor, we accept the use of portable fans as backup HVAC equipment for these areas.

This exemption should be granted.

Validation/Conclusions:

~~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.~~

These Fire Compartments were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

FPE RAI 02 and SSD RAI 06

BVPS-1

Licensing Action #: 11.09

Licensing Action: 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)

Disposition:

~~Licensing Action acceptable for transition~~

Not being transitioned

FPE RAI 02 and SSD RAI 06

References:

- 1OST-33.15A, Revision 18, "Fire Extinguisher Monthly Inspection."
- 1OST-33.16, Revision 15, "Smoke Detector Instrumentation Test."
- 1OST-33.16F, Revision 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room."
- 1OST-33.2A, Revision 5, "Fire Protection System Monthly Hose Stations Test."
- 1OM-56C.4.F-12, Revision 9, "Establishing Portable Emergency Ventilation."
- 1PFP-SRVB-713-AE, Revision 1, "Switchgear Room Fire Area ES-1."
- 1PFP-SRVB-713-DF, Revision 1, "Switchgear Room Fire Area ES-2."
- 2OM-56B.4.2.E1, Revision 6, "Setting Up Portable Ventilation."
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 12, "Fire Hazards Analysis."
- 8700-DMC-1559, Revision 0, Addendum 0, "Charging Pump Cubicle Heatup Following a DBA and Loss of All Ventilation."
- 8700-DMC-2341, Revision 1, "Basis for Exemption of Non-Qualified Fire Damper VS-D-263 and VS-D-266."
- 8700-DMC-2864, Revision 0, "Emergency Switchgear Room Temperatures During CIB/Loss of Normal Switchgear HVAC."

Associations:

~~Ch.4 - Compartment: 1-ES-1~~

FPE RAI 02 and SSD RAI 06

BVPS-1

Licensing Action #: 11.09

Licensing Action: 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)

~~Ch.4 - Compartment: 1-ES-2~~
~~Fire Protection - Fire Compartment: 1-ES-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 1-ES-1 / Form: Water-Based Suppression~~
~~Fire Protection - Fire Compartment: 1-ES-2 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 1-ES-2 / Form: Water-Based Suppression~~
None

FPE RAI 02 and SSD RAI 06

BVPS-1

Licensing Action #: 11.10

Licensing Action: Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hour Fire Barriers (III.G.2 criteria)

Basis Date: August 30, 1984

To Be Transitioned?: ~~Yes~~ No

FPE RAI 02 and SSD RAI 06

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Process Instrument Room (1-CR-4), Elevation 713' does not comply with Section III.G.3 because the compartment is not provided with fixed automatic fire suppression.

The BVPS-1 letter dated December 16, 1983, requested an exemption from the requirement for fixed automatic fire suppression for 1-CR-4. An exemption was also requested from the requirements of Section III.G.2 for fire compartment 1-CR-4 because of fire barriers (ceiling and doors) that have a fire rating of 1.5 hours (less than three hours).*

The potentially affected safe shutdown equipment from a fire in the Process Instrument Room (1-CR-4) includes the primary and secondary process racks, reactor protection racks, emergency auxiliary shutdown panel, and Class 1E and non-Class 1E equipment and cable.

The exemptions for the Process Instrument Room (1-CR-4), Elevation 713' were approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Process Instrument Room (1-CR-4), Elevation 713':

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- Detection and manual fire suppression equipment is available.
- The doors and ceiling exceed the combustible loading in the process rack room and relay room with considerable margin.

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

SSD RAI 06

Evaluation:

The NRC SER dated August 30, 1984, states:

We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:

1. Fixed Suppression and Detection Systems

For the following area, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:

Process Instrument Room (CR-4), Elev. 713

BVPS-1

Licensing Action #: 11.10

Licensing Action: Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hour Fire Barriers (III.G.2 criteria)

....

All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability, detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

Regarding the Process Instrument Room (1-CR-4) Elevation 713', the NRC SER states:

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The process instrument room is located on the 713 elev. beneath the cable spreading room. The ceiling which forms a barrier between the process instrument room and the cable spreading room is a 1 1/2-hour rated fire barrier. In addition, three doors which communicate to the adjacent relay room (CR-3) are 1 1/2-hour rated fire doors. All other boundaries are 3-hour rated.

The combustible loading in the area, 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. Alternate shutdown capability independent of the area is also provided.

The 1 1/2-hour rated fire doors which lead to the relay room and 1 1/2-hour rated ceiling exceed the combustible loading in both the process instrument room and the relay room with considerable margin. In the event a fire occurred in either room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the door's or ceiling's integrity is challenged. Replacing the existing doors and ceiling with a 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we conclude that the protection provided for the process instrument room provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

Validation/Conclusions:

~~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~~

FPE RAI 02 and SSD RAI 06

BVPS-1

Licensing Action #: 11.10

Licensing Action: Process Instrumentation Room (1-CR-4) - Lack of Automatic Suppression (III.G.3 criteria) and Lack of 3-Hour Fire Barriers (III.G.2 criteria)

~~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.~~

FPE RAI 02 and SSD RAI 06

The Fire Compartment was evaluated using the performance-based approach in NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

~~Licensing Action acceptable for transition~~

FPE RAI 02 and SSD RAI 06

Not being transitioned

References:

- 1OST-33.15A, Revision 18, "Fire Extinguisher Monthly Inspection."
- 1OST-33.16F, Revision 4, "Early Warning Smoke Detection Instrumentation Test Service Building and Control Room."
- 1OST-33.2A, Revision 5, "Fire Protection System Monthly Hose Stations Test."
- 1PFP-SRVB-713-Process, Revision 2, "Process Rack Room Fire Area CR-4."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 12, "Fire Hazards Analysis."
- 8700-DMC-2840, Revision 0, Addendum 2, "Engineering Evaluation of Non-Rated Fire Assemblies."

Associations:

~~Ch.4 - Compartment: 1-CR-4~~
~~Ch.4 - Compartment: 1-MG-1~~
~~Fire Protection - Fire Compartment: 1-CR-4 / Form: Detection~~
~~Fire Protection - Fire Compartment: 1-CR-4 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 1-MG-1 / Form: Passive Protection~~

FPE RAI 02 and SSD RAI 06

None

BVPS-1

Licensing Action #: 11.11

Licensing Action: 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)

Basis Date: August 30, 1984

To Be Transitioned?: No

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Communication Equipment and Relay Panel Room (1-CR-3), Elevation 713' does not comply with Section III.G.3 because the compartment is not provided with fixed automatic fire suppression. The BVPS-1 letter dated December 16, 1983, requested an exemption from the requirement for fixed automatic fire suppression for 1-CR-3. An exemption was also requested from the requirements of Section III.G.2 for fire compartment 1-CR-3 because of fire barriers (ceiling and doors), which have a fire rating of 1.5 hours (less than three hours).

The potentially affected safe shutdown equipment from a fire in the Communication Equipment and Relay Panel Room (1-CR-3) is limited because equipment located in this compartment is mainly relay and communication panels. The primary components, located in this compartment, required for safe shutdown are the diesel generator protection panels.

The exemptions for the Communication Equipment and Relay Panel Room (1-CR-3), Elevation 713' were approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Communication Equipment and Relay Panel Room (1-CR-3), Elevation 713':

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- Detection and manual fire suppression equipment is available.
- The doors and ceiling exceed the combustible loading in the Communication Equipment and Relay Panel Room with considerable margin.

Evaluation:

The NRC SER dated August 30, 1984, states:

> *We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:*
>
> *1. Fixed Suppression and Detection Systems*
>
> *For the following area, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:*
>
> *Communications Equipment & Relay Panel Room (CR-3), Elev. 713*
>
> ....

BVPS-1

Licensing Action #: 11.11

Licensing Action: 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)

All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability, detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

Regarding the Communications Equipment & Relay Panel Room (1-CR-3), Elevation 713', the NRC SER also states:

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The communications equipment and relay panel room is located on the 713' elev. beneath the cable spreading room. The ceiling that separates the relay room from the cable spreading room is a 1 1/2-hour rated fire barrier. In addition, two doors that communicate with the adjacent process instrument room (CR-4) carry a 1 1/2-hour rating.

Smoke detection and manual fire suppression equipment are provided in the area. The combustible loading in the area, if totally consumed, would correspond to an equivalent fire severity of approximately fifty minutes on the ASTM E-119 Standard Time-Temperature Curve. Alternate shutdown capability independent of the area is provided.

The 1 1/2-hour rated fire doors which lead to the process instrument room and the 1 1/2-hour rated ceiling exceed the combustible loading in both the process instrument room and the relay room with considerable margin. In the event a fire occurred in either room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the door's integrity is challenged. Replacing the existing doors and ceiling with 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we conclude that the protection provided for the Communications Equipment & Relay Panel Room provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

BVPS-1

Licensing Action #: 11.11

Licensing Action: 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)

Disposition:

Not being transitioned

References:

- 1OST-33.15A, Revision 15, "Fire Extinguisher Monthly Inspection."
- 1OST-33.2A, Revision 4, "Fire Protection System Monthly Hose Stations Test."
- 1PFP-SRVB-713-Relay Room, Revision 0, "Fire Area CR-3."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."

Associations:

None

BVPS-1

Licensing Action #: 11.12

Licensing Action: 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)

Basis Date: August 30, 1984

To Be Transitioned?: No

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Normal Switchgear Room (1-NS-1), Elevation 713' does not comply with Section III.G.3 because the compartment is not provided with fixed automatic fire suppression.

The BVPS-1 letter dated December 16, 1983, requested an exemption from the requirement for fixed automatic fire suppression for NS-1. An exemption was also requested from the requirements of Section III.G.2 for fire compartment NS-1 because of fire barriers (fire dampers) that have a fire rating of less than three hours.

The potentially affected safe shutdown equipment from a fire in the Normal Switchgear Room (1-NS-1) are various control and protection circuits for both emergency diesels routed through this compartment. Potential loss of safe shutdown instrumentation may be lost for a fire in this compartment, which would require use of the Backup Indicating Panel.

The exemptions for the Normal Switchgear Room (1-NS-1), Elevation 713' were approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Normal Switchgear Room (1-NS-1), Elevation 713':

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- Detection and manual fire suppression equipment is available.
- The dampers exceed the combustible loading with considerable margin.

Evaluation:

The NRC SER dated August 30, 1984, states:

> *We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:*
>
> *1. Fixed Suppression and Detection Systems*
>
> *For the following area, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:*
>
> *Normal Switchgear Room (NS-1), Elev. 713*
>
> ....
>
> *All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability,*

detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

Regarding the Normal Switchgear Room, the NRC SER also states:

6. Normal Switchgear Room NS-1 Elev. 713

An exemption is requested from Section 111.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The normal switchgear room is located on the 713 elev. of the service building, one floor below the cable spreading room. The normal switchgear room is surrounded by 3-hour rated barriers with the exception of 1 1/2-hour rated fire dampers installed in the ductwork that penetrates the cable spreading room.

Smoke detection and manual fire suppression equipment are provided in the area. The combustible loading in the area, if totally consumed, would correspond to an equivalent fire severity of approximately 50 minutes on the ASTM E-119 Standard Time-Temperature Curve. Alternate shutdown capability independent of the area is also provided.

The 1 1/2-hour rated fire dampers which lead to the cable spreading room exceed the combustible loading in the normal switchgear room with considerable margin. In the event a fire occurred in the switchgear room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the dampers' integrity is challenged. Replacing the existing dampers with 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we conclude that the protection provided for the normal switchgear room provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 1OST-33.15A, Revision 15, "Fire Extinguisher Monthly Inspection."

BVPS-1

Licensing Action #: 11.12

Licensing Action: 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)

- 1OST-33.2A, Revision 4, "Fire Protection System Monthly Hose Stations Test."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."
- DCP-1482, Revision 0, "Group 1 Fire Damper Replacement."

Associations:

None

BVPS-1

Licensing Action #: 11.13

Licensing Action: Service Building Structural Steel (Area Below 1-CS-1) - Lack of Fire Protection for Structural Steel (III.G.2a criteria)

Basis Date: November 21, 1985

To Be Transitioned?: No

Basis:

III.G.2a requires that structural steel forming a part of or supporting a fire barrier shall be protected to provide fire resistance equivalent to that required of the barrier. Service Building, Elevation 713' did not comply with Section III.G.2a because the compartment did not have a fire resistant coating on the structural steel supporting the ceiling. The BVPS-1 letter dated December 16, 1983, requested an exemption from the requirement because the structural steel in the compartments below fire compartment 1-CS-1 (1-ES-1, 1-ES-2, 1-MG-1, 1-CR-3, and 1-CR-4) did not have a fire resistant coating on the structural steel supporting the ceiling.

Evaluation:

Via subsequent correspondence, the exemption request was resolved by completion of a plant modification which involved fire coating the structural steel. The BVPS-1 letter dated November 21, 1985, confirmed that the schedule for completion of structural steel fire protection and, in the interim, instituting a 1-hour fire watch in those areas (as required by Technical Specifications 3.7.15) a reasonable approach to resolution of providing the structural steel with a fire resistance equivalent to that required of the barrier as committed to in a BVPS-1 letter dated July 10, 1985.

Validation/Conclusions:

Compliance with III.G.2a criteria was established by completing plant modifications to provide protection for the subject structural steel; therefore, this licensing action is no longer necessary. This exemption request will not appear in LAR TR Section 2.2.

Disposition:

Not being transitioned

References:

- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- UFPARR, Revision 27, "Updated Fire Protection Appendix R Review."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 85-07-10, "BVPS-1 Appendix R - Fire Protection."
- 85-11-21, "Structural Steel Fire Protection Exemption Request for Beaver Valley 1 (Licensing Actions TAC 53694 and 59067)."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."

BVPS-1

Licensing Action #: 11.13

Licensing Action: Service Building Structural Steel (Area Below 1-CS-1) - Lack of Fire Protection for Structural Steel (III.G.2a criteria)

Associations:

None

BVPS-1

Licensing Action #: 11.14

Licensing Action: Carbon Dioxide Storage/PG Pump Room (1-CO-2) - Lack of Automatic Suppression and Detection (III.G.3 criteria)

Basis Date: August 30, 1984

To Be Transitioned?: No

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Carbon Dioxide Storage/PG Pump Room (1-CO-2) does not comply with Section III.G.3 because the compartment is not provided with fixed automatic fire suppression or fire detection. The BVPS-1 letter dated December 16, 1983 requested an exemption from the requirement for fixed automatic fire suppression and detection for 1-CO-2.

The original Appendix R submittal dated June 30, 1982, (Section 6.9) identified potential loss of all four river water supply valves to the emergency diesel generator heat exchangers given a fire in compartment 1-CO-2 and proposed to relocate one valve, MOV-RW113D, to the diesel generator building. A subsequent design change (DCP 2104) has relocated all of the valves out of fire compartment 1-CO-2, and into their respective diesel generator buildings.

The exemption for the Carbon Dioxide Storage/PG Pump Room (1-CO-2) was approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Carbon Dioxide Storage/PG Pump Room (1-CO-2):

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- The carbon dioxide storage area (1-CO-2) is in a separate building adjacent to the diesel generator building. A fire in this area would not threaten safe shutdown equipment.

Evaluation:

The NRC SER dated August 30, 1984 states:

> *We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:*
>
> *1. Fixed Suppression and Detection Systems*
>
> *For the following area, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:*
>
> *Carbon Dioxide Storage/PG Pump Room (CO-2)...*
>
> *With the exception of the Carbon Dioxide Storage/PG Pump Room (CO-2), all of these areas are provided with either partial or complete fire detection systems. The*

BVPS-1

Licensing Action #: 11.14

Licensing Action: Carbon Dioxide Storage/PG Pump Room (1-CO-2) - Lack of Automatic Suppression and Detection (III.G.3 criteria)

carbon dioxide storage area is in a separate building adjacent to the diesel generator buildings. A fire in this area would not threaten safe-shutdown equipment.

All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability, detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- UFPARR, Revision 27, "Updated Fire Protection Appendix R Review."

Associations:

None

BVPS-1

Licensing Action #: 11.15

Licensing Action: Pipe Tunnel (Subarea 1-QP-1) - Lack of Automatic Suppression (III.G.3 criteria)

Basis Date: August 30, 1984

To Be Transitioned?: No

Basis:

III.G.3 requires automatic fire suppression and detection in fire compartments for which alternate shutdown has been provided. Pipe Tunnel (Sub-compartment 1-QP-1) Elevation 735' does not comply with Section III.G.3 because the compartment is not provided with fixed automatic fire suppression throughout the fire compartment. The BVPS-1 letter dated December 16, 1983, requested an exemption from the requirement for fixed automatic fire suppression for 1-NS-1.

The potentially affected safe shutdown equipment from a fire in the Pipe Tunnel (Sub-compartment 1-QP-1) are the Redundant Auxiliary Feedwater Pumps.

The exemption for the Pipe Tunnel (Sub-compartment 1-QP-1), Elevation 735' was approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Pipe Tunnel (Sub-compartment 1-QP-1), Elevation 735':

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- Detection and manual fire suppression equipment is available.

Evaluation:

The NRC SER dated August 30, 1984, states:

> *We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:*
>
> *1. Fixed Suppression and Detection Systems*
>
> *For the following area, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:*
>
> *Pipe Tunnel (Sub-area QP-1), Elev. 735*
>
> ....
>
> *All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability, detection (except CO2 storage area) and manual fire suppression equipment is available.... The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.*

BVPS-1

Licensing Action #: 11.15

Licensing Action: Pipe Tunnel (Subarea 1-QP-1) - Lack of Automatic Suppression (III.G.3 criteria)

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 1OST-33.15A, Revision 15, "Fire Extinguisher Monthly Inspection."
- 1OST-33.16, Revision 14, "Smoke Detector Instrumentation Test."
- 1PFP-SFGB-735-Aux FW & QS Pumps, Revision 0, "Fire Area QP-1."
- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."

Associations:

None

BVPS-1

Licensing Action #: 11.16

Licensing Action: 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)

Basis Date: August 30, 1984

To Be Transitioned?: Yes

Basis:

Reactor Containment (1-RC-1) does not comply with III.G.2, which requires that redundant trains of safe shutdown cables and equipment inside non-inerted containments be separated by 20 feet with no intervening combustible materials or fire hazards, or separated by noncombustible radiant energy shields, or an automatic suppression and detection system must be installed in the compartment. The original exemption request for the Reactor Containment is described in Licensing Action No. 2. Clarifications of cable routing in Containment were provided in the BVPS-1 letter dated October 22, 1982. The exemption approval was provided by the NRC in the SER dated March 14, 1983.

The BVPS-1 letter dated December 16, 1983, requested an additional exemption from the requirements of Section III.G.2 for RC-1 because the original submittal did not include the source range nuclear instrumentation as a required safe shutdown parameter. The cables for the redundant source range nuclear instrument channels are in separate conduits, but do not meet the 20 foot separation criteria.

The potentially affected safe shutdown equipment from a fire in the Reactor Containment (1-RC-1) for this specific exemption is the source range nuclear instrumentation.

The exemption for the Reactor Containment (1-RC-1) source range nuclear instrumentation was approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Reactor Containment (1-RC-1) source range nuclear instrumentation:

- All cable insulation is qualified to a test comparable to IEEE standard 383.*
- The reactor coolant pumps are fitted with an oil collection system.
- Smoke detection systems and water deluge systems are provided in the cable penetration area and in the residual heat removal pump area.
- Portable fire extinguishers and manual hose stations are provided throughout the fire area.
- Separation of approximately 5 feet is maintained between source range channels.
- Source range cables are in conduit.

*Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").

BVPS-1

Licensing Action #: 11.16

Licensing Action: 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)

Evaluation:

The NRC SER dated August 30, 1984 states:

8. Reactor Containment RC-1

An exemption is requested from Section III.G to the extent it requires the separation of redundant trains of the source range monitor within containment by greater than 20 feet.

This fire area includes the entire area inside containment. The redundant trains of safe shutdown components in this area include the containment ventilation, pressurizer pressure controls, pressurizer power operated relief valves, pressurizer relief blocking valves, pressurizer heaters, steam generator level transmitters, pressurizer level transmitters, reactor coolant hot and cold leg temperature instrumentation, and associated cables.

The combustible loading in this area consists of approximately 48,000 pounds of cable insulation, 265 gallons of lubricating oil for each of the three reactor coolant pumps, and 200 pounds of charcoal in the containment air filter cubicles.

All cable insulation is qualified to a test comparable to IEEE Standard 383. The reactor coolant pumps are fitted with an oil collection system. Smoke detection systems and water deluge systems are provided only in the cable penetration area and in the residual heat removal pump area. Portable fire extinguishers and manual hose stations are provided throughout the fire area.

We had previously approved an exemption for the separation of redundant equipment and cables inside containment. At our request, the licensee has added an additional channel of source range neutron detection. Due to the physical arrangement inside containment, separation of the redundant cables by more than 20-feet is not possible. A minimum separation of approximately five feet is maintained. Each channel of neutron detection is in a separate conduit."

The protection for redundant trains of safe shutdown equipment inside containment does not meet the technical requirements of Section III.G because redundant power cables are not separated by at least 20 feet free of combustibles. Due to the configuration and location of the cables within the containment and to the restricted access of these sub-areas during plant operation, an exposure fire involving the accumulation of significant quantities of transient combustible materials is unlikely. Because there are only a few cables in these sub-areas and all cables inside containment are qualified to a test comparable to that of IEEE Standard 383 and routed in conduit, a fire of sufficient magnitude to damage redundant cables or components is also unlikely.

Based on the above evaluation, the existing protection for the containment area provides a level of fire protection equivalent to the technical requirements of Section III.G of Appendix R. Therefore, the exemption should be granted.

BVPS-1

Licensing Action #: 11.16

Licensing Action: 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)

Validation/Conclusions:

Conformance with the Appendix R exemption bases reached with the NRC regarding 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), as stated in the NRC SER dated August 30, 1984, was verified. The exemption for Reactor Containment (1-RC-1) is being transitioned to the new licensing basis under NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 1OST-33.13B, Revision 14, "Deluge Valve Fire Protection System Instrument Test."
- 1OST-33.15A, Revision 18, "Fire Extinguisher Monthly Inspection."
- 1OST-33.2A, Revision 5, "Fire Protection System Monthly Hose Stations Test."
- 1OST-33.21A, Revision 8, "Containment Area Smoke Detection Instrumentation Test."
- 82-10-22, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-01.062-0075, Revision A, "Fire Risk Evaluation of Reactor Containment Building (1-RC-1)." LIC (1)
- 8700-RB-0002L, Revision 6, "Fire Protection Arrangement."
- 8700-RB-0140A, Revision 3, "Oil Collection System for Reactor Coolant Pump."
- 8700-RE-0035A, Revision 7, "Arrangement - Electrical Penetrations Reactor Containment."
- 8700-RE-0035B, Revision 7, "Electrical Penetration Terminal Boxes Reactor Containment."
- 8700-RE-0046J, Revision 4, "Conduit Plan Nuclear Instrumentation."
- 8700-RE-0046K, Revision 3, "Conduit Plan Nuclear Instrumentation."

BVPS-1

Licensing Action #: 11.16

Licensing Action: 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)

- TER-12661, Revision 0, "Appendix R Report Update for CR971034."
- TER-13757, Revision 0, "Revise Appendix 'R' Report Statements for Flame Retardancy."
- UFSAR, Revision 29, "BVPS-1 Updated Final Safety Analysis Report."

Associations:

Ch.4 - Compartment: 1-RC-1
Fire Protection - Fire Compartment: 1-RC-1 / Form: Detection
Fire Protection - Fire Compartment: 1-RC-1 / Form: Water-Based Suppression

LIC (1)

BVPS-1

Licensing Action #: 11.17

Licensing Action: Cable Spreading Room (1-CS-1) - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

Basis Date: August 30, 1984

To Be Transitioned?: ~~Yes~~ No

FPE RAI 02 and SSD RAI 06

Basis:

The BVPS-1 letter dated December 16, 1983, requested an exemption from the requirement of Section III.G.2 for fire compartment 1-CS-1 because of fire barriers (doors, dampers, and floor) that have a fire rating of 1.5 hours (less than three hours).

The potentially affected safe shutdown equipment from a fire in the Cable Spreading Room (1-CS-1) is as follows:

- The cable spreading compartment contains safety related redundant instrument, control, and power cables that are required for attaining safe shutdown.
- Emergency powered redundant supply and exhaust fans for the emergency switchgear and battery rooms.

The exemption for the Cable Spreading Room (1-CS-1) was approved and documented in the NRC SER dated August 30, 1984.

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the Cable Spreading Room (1-CS-1):

- Combustible loading is light.
- Alternate shutdown capability is provided independent of the fire area.
- Detection and manual fire suppression equipment is available.

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

SSD RAI 06

Evaluation:

Regarding the Cable Spreading Room (1-CS-1), Elevation 725'-6" the NRC SER dated August 30, 1984 states:

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by complete 3-hour rated barriers.

The cable spreading room is located on the 725' 6" elev. of the service building. The walls and ceiling constitute 3-hour rated barriers. The floor is a 1 1/2-hour rated floor. Ductwork is provided with 3-hour rated dampers except those ducts which penetrate the floor and the west wall which separates the cable spreading room from the normal switchgear room. These ducts are provided with 1 1/2-hour rated dampers. All cables and equipment needed for safe-shutdown will be removed from the normal switchgear room and relocated at the next refueling outage. The cable spreading room doors are 3-hour rated except for the 1 1/2-hour rated door that opens in the east stairtower.

BVPS-1

Licensing Action #: 11.17

Licensing Action: Cable Spreading Room (1-CS-1) - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

The combustible loading in the cable spreading room, if totally consumed, would correspond to an equivalent fire severity of approximately 1-hour and twenty minutes on the ASTM E-119 Standard Time-Temperature Curve.

To approve fire area boundaries of less than a 3-hour rating, we need reasonable assurance that the proposed boundaries will exceed the in-situ fuel load with margin. In the cable spreading room, the margin proposed is not considered adequate for the general case. However, in the three specific cases cited, we have evaluated the location and configuration of the 1 1/2-hour rated components and consider them acceptable for the following reasons:

- *1 1/2-hour rated stairtower door - Section C.5.a of our guidelines recommends the use of 2-hour rated concrete stairtower enclosures with self-closing Class B (1 1/2-hour) fire doors. The licensee has provided this level of protection. We, therefore, find the 1 1/2-hour rated fire doors acceptable.*
- *1 1/2-hour rated floor and 1 1/2-hour rated fire dampers in the floor. In the event of a fire in the cable spreading room, the heat from the fire would rise and challenge the ceiling and upper wall areas of the cable spreading room. Only after a considerable time period will the heat transfer down through the floor become significant. With the added benefit of the installed smoke detection system, automatic suppression system and response of the fire brigade, there is reasonable assurance that the 1 1/2-hour rated floor and dampers will remain functional.*
- *1 1/2-hour rated dampers penetrating the wall to the normal switchgear room. The licensee has committed to remove all cables and equipment from the normal switchgear room needed for safe-shutdown. Therefore, if a fire propagated to this area, by the failure of the 1 1/2-hour rated damper, no safe-shutdown equipment would be damaged. The walls of the normal switchgear room that separate it from the remainder of the plant are 3-hour rated barriers. Therefore, a cable spreading room fire which spreads to the switchgear room by failure of the 1 1/2-hour rated dampers will not spread beyond the normal switchgear room.*

Based on our evaluation, we conclude that the protection provided for the cable spreading room provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

Validation/Conclusions:

~~Conformance with the Appendix R exemption bases reached with the NRC regarding Cable Spreading Room (1-CS-1), Elevation 725'-6"; lack of three-hour barriers (III.G.2 criteria), as stated in the NRC SER dated August 30, 1984, was verified. Automatic detection and CO2 suppression are available to meet the performance-based analysis and are allowed by~~

FPE RAI 02 and SSD RAI 06

BVPS-1

Licensing Action #: 11.17

Licensing Action: Cable Spreading Room (1-CS-1) - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

~~NFPA 805. 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.~~

FPE RAI 02 and SSD RAI 06

The Fire Compartment was evaluated using the performance-based approach in NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

~~Licensing Action acceptable for transition~~

FPE RAI 02 and SSD RAI 06

Not being transitioned

References:

- 1OST-33.16, Revision 15, "Smoke Detector Instrumentation Test."
- 1OST-33.16B, Revision 2, "Early Warning Smoke Detection Instrumentation Test Diesel Generator Rooms Cable Vaults and Cable Mezzanine."
- 1OST-33.2A, Revision 5, "Fire Protection System Monthly Hose Stations Test."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 83-12-16, "Appendix R - Additional Exemption Requests Based on Generic Letter 83-33."
- 84-08-30, "BVPS-1 Request for Additional Informations from Some Requirements of Appendix R to 10 CFR Part 50."
- 8700-B-084, Revision 12, Addendum 1, "Fire Hazards Analysis."

Associations:

FPE RAI 02 and SSD RAI 06

~~Ch.4 - Compartment: 1-CS-1~~
~~Ch.4 - Compartment: 1-CR-2~~
~~Ch.4 - Compartment: 1-CR-3~~
~~Ch.4 - Compartment: 1-CR-4~~
~~Ch.4 - Compartment: 1-ES-1~~
~~Ch.4 - Compartment: 1-ES-2~~
~~Ch.4 - Compartment: 1-MG-1~~
~~Fire Protection - Fire Compartment: 1-CR-2 / Form: Detection~~
~~Fire Protection - Fire Compartment: 1-CR-2 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 1-CR-3 / Form: Detection~~
~~Fire Protection - Fire Compartment: 1-CR-3 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 1-CR-4 / Form: Detection~~
~~Fire Protection - Fire Compartment: 1-CS-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 1-CR-2 / Form: Water-Based Suppression~~
~~Fire Protection - Fire Compartment: 1-ES-1 / Form: Detection~~
~~Fire Protection - Fire Compartment: 1-ES-2 / Form: Detection~~
~~Fire Protection - Fire Compartment: 1-MG-1 / Form: Detection~~
~~Fire Protection - Fire Compartment: 1-MG-1 / Form: Passive Protection~~

BVPS-1

Licensing Action #: 11.17

Licensing Action: Cable Spreading Room (1-CS-1) - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

None

FPE RAI 02 and SSD RAI 06

BVPS-1

Licensing Action #: 11.18

Licensing Action: Fire Doors - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

Basis Date: December 4, 1986

To Be Transitioned?: Yes

Basis:

The BVPS-1 letter dated January 14, 1985, requested an exemption from the requirement of Section III.G.2 for various fire doors because the doors in question do not have UL labels and/or modifications have been made to the rated fire doors. In addition, various discrepancies to the doors were identified, that includes security modifications, unlabeled frames, and conduit/pipe penetrations through the frames. Supplemental submittals, dated October 16, 1985, and October 28, 1986, were provided to support the justification for the subject configurations. The NRC letter dated December 4, 1986, stated that Section III.G.2 applies to hot shutdown components in the same fire compartment, not fire compartment boundaries. Per the NRC SER dated December 4, 1986, guidelines for fire compartment boundaries are set forth in Appendix A to BTP 9.5-1, Section D.1.(j). Therefore, the staff reviewed the fire door submittal as a deviation from conformance to Appendix A of BTP 9.5-1 and found the deviation acceptable.

BTP 9.5.1, Section C.5.a.(5), requires, in part, that, "Door openings in fire barriers should be protected with equivalently rated doors, frames, and hardware that have been tested and approved by a nationally recognized laboratory."

The deviation for the subject fire doors was approved and documented in the NRC SER dated December 4, 1986 (TAC 56566).

The following conditions were cited in the NRC SER as the bases for the exemption approval relative to the fire doors:

- The equivalent fire severity in each of the affected compartments is less than 120 minutes and generally less than 60 minutes.
- Except for the doors located in the intake structure, the corrective modifications provide an adequate margin of fire resistance compared to the combustible loading.
- For the doors in the intake structure, the corrective modifications are not possible due to functional restrictions (air pipes cannot be sealed internally). However, the door assemblies in conjunction with the resistance of the 3-hour fire rated masonry walls, provide an adequate margin of fire resistance between redundant trains of safe shutdown equipment. The solid wall between 1-IS-2 and 1-IS-3 would prevent a fire from spreading to 1-IS-3 or 1-IS-4. Auxiliary river water pumps located in the separate auxiliary intake structure are available as backup systems.

Evaluation:

The NRC SER dated December 4, 1986, states that, "We found the deviation of fire door design from our guidelines acceptable. Details may be found in the safety evaluation, Enclosure 2."

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Licensing Action #: 11.18

Licensing Action: Fire Doors - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

The SER also states:

1. Fire doors for twenty-four fire areas.

Exemptions were requested from the technical requirements of Section III.G.2.a to the extent that the fire door assemblies in the 3-hour fire-rated barriers that separate these areas are not UL-listed for 3 hours.

Section III.G.2 of Appendix R to 10 CFR 50 contains requirements for the protection of hot shutdown components located within the same fire area. It does not apply to fire area boundaries. Acceptable guidelines for establishment of fire area boundaries are set forth in Section D.1.(j) of Appendix A to BTP APCSB 9.5-1. Therefore, the staff has reviewed the fire doors discussed in the Licensee's request for conformance with Appendix A guidelines.

Enclosure 2 states:

2.3 Evaluation

The guidelines of Section D.1.(j) of Appendix A to BTP APCSB 9.5-1 are not met because a fire door is not labeled (1 location) or because fire door frames are not labeled (10 locations), fire doors have been modified for security purposes (18 locations), or fire doors have been penetrated by pipe or conduit (8 locations). Several locations contain multiple deviations.

However, the equivalent fire severity in each of the affected fire areas is less than 120 minutes and generally less than 60 minutes.

The staff has reviewed the licensee's evaluation and concurs with the licensee's assessment that the existing fire door assemblies with the corrective modifications provide an adequate margin of fire resistance compared to the combustible loading in the affected fire areas, with one exception.

The exception to the fire resistance discussed above is the doors located in the intake structure. Due to the functional restrictions, the corrective modifications required to upgrade these doors are not possible. However, these door assemblies, in conjunction with the resistance of the 3-hour fire-rated masonry walls, provide an adequate margin of fire resistance between redundant trains of safe shutdown systems. The staff therefore concludes that the intake structure door assemblies should be acceptable.

2.4 Conclusion

Based on the above evaluation, the staff concludes that the aforementioned fire door assemblies, combined with the licensee's modifications, provide an acceptable level of protection in accordance with the guidelines of Section D.1(j) of Appendix A to BTP APCSB 9.5-1.

Validation/Conclusions:

Conformance with the Appendix R exemption bases reached with the NRC regarding Fire Doors (lack of 3-hour fire barriers [III.G.2 criteria]), as stated in the NRC SER dated

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Licensing Action #: 11.18

Licensing Action: Fire Doors - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

December 4, 1986, was verified. The combustible loading for 1-NS-1 has increased to over 1 hour but is less than 1.5 hours. This combustible loading increase has been determined to be acceptable by a performance-based evaluation and the basis for previous acceptance remains valid. The exemption for the subject fire doors is being transitioned to the new licensing basis under NFPA 805. LIC (2)

Disposition:

Licensing Action acceptable for transition

References:

- 10080-DEC-3560, Revision 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning."
- 85-01-14, "Appendix R - Additional Exemption Requests."
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)."
- 8700-01.062-0048, Revision A, "Beaver Valley Unit 1 NFPA 805 Safe Shutdown Analysis Interim Transition Report."
- 8700-01.062-0098, Revision A, "FDS Analysis of Existing Licensing Action 11.18 for Fire Area 1-NS-1." LIC (2)
- 8700-B-084, Revision 12, "Fire Hazards Analysis."
- 8700-B-084, Revision 12, Addendum 1, "Fire Hazards Analysis."
- 8700-RA-0006A, Sheet 1, Revision 28, "Door Schedule - Sheet 1."
- CA 971034-03, Revision 0, "Corrective Action: Fire Protection Engineer Review of Exemption Requests."
- TER-12224, Revision 0, "Evaluate Change of Manufacturer for Fire Door Assembly S13-4."
- TER-12661, Revision 0, "Appendix R Report Update for CR971034."
- UFSAR, Revision 29, "BVPS-1 Updated Final Safety Analysis Report."

Associations:

Ch.4 - Compartment: 1-CR-2
Ch.4 - Compartment: 1-CR-4
Ch.4 - Compartment: 1-CS-1
Ch.4 - Compartment: 1-CV-1
Ch.4 - Compartment: 1-CV-2
Ch.4 - Compartment: 1-ES-1
Ch.4 - Compartment: 1-ES-2
Ch.4 - Compartment: 1-FB-1

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Licensing Action #: 11.18

Licensing Action: Fire Doors - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

Ch.4 - Compartment: 1-MG-1
Ch.4 - Compartment: 1-MS-1
Ch.4 - Compartment: 1-NS-1
Ch.4 - Compartment: 1-PA-1A
~~Ch.4 - Compartment: 1-PA-1C~~ LIC (3)
Ch.4 - Compartment: 1-PA-1E
Ch.4 - Compartment: 1-PA-1G
Ch.4 - Compartment: 1-PA-1GA
Ch.4 - Compartment: 1-PA-1GB
Ch.4 - Compartment: 1-PA-1GC
Ch.4 - Compartment: 1-TB-1
Ch.4 - Compartment: 3-CR-1
Ch.4 - Compartment: 3-IS-1
Ch.4 - Compartment: 3-IS-2
Ch.4 - Compartment: 3-IS-3
Ch.4 - Compartment: 3-IS-4
Ch.4 - Compartment: 3-IS-6 FPE RAI 02
Fire Protection - Fire Compartment: 1-CR-2 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-CR-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-CS-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-CV-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-CV-2 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-ES-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-ES-2 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-FB-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-MG-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-MS-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-NS-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-PA-1A / Form: Passive Protection
~~Fire Protection - Fire Compartment: 1-PA-1C / Form: Passive Protection~~ LIC (3)
Fire Protection - Fire Compartment: 1-PA-1E / Form: Passive Protection
Fire Protection - Fire Compartment: 1-PA-1G / Form: Passive Protection
Fire Protection - Fire Compartment: 1-PT-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-SB-GEN / Form: Passive Protection LIC (4)
Fire Protection - Fire Compartment: 1-SGPD-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 1-TB-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 3-CR-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 3-IS-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 3-IS-2 / Form: Passive Protection FPE RAI 02
Fire Protection - Fire Compartment: 3-IS-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 3-IS-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 3-IS-6 / Form: Passive Protection

BVPS-1

Licensing Action #: 11.19

Licensing Action: Fire Dampers - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

Basis Date: June 29, 1990

To Be Transitioned?: No

Basis:

The BVPS-1 letter dated January 14, 1985, requested an exemption from the requirement of Section III.G.2 for 3-hour rated barriers because various unlabeled, field-fabricated, fire dampers [SMACNA] (Sheet Metal and Air Conditioning Contractor's National Association specification dampers) are rated for 1.5 hours. The NRC SER dated December 4, 1986, (TAC 56566) stated that Appendix R paragraph III.G.2(a) does not apply to fire compartment boundaries and evaluated the fire dampers as a deviation to Section D.1.(j) of Appendix A to BTP APCSB 9.5-1. Initially, the NRC found the deviation unacceptable because of the lack of testing to demonstrate the effect of the design differences on damper performance.

BTP 9.5.1, Section C.5.a(4) requires, in part, that, "Penetration openings for ventilation systems should be protected by fire dampers having a rating equivalent to that required of the barrier."

By letter dated December 19, 1989, BVPS-1 committed to perform the following actions:

- For fire area with combustible loading exceeding one hour, the fire dampers would be replaced with rated dampers. A total of 17 fire dampers were identified. These were subsequently replaced with 3-hour rated dampers by DCP 1482, as described in Section 6.16 of the Appendix R Report. (BVPS-1 letter dated July 22, 1991, Unqualified Fire Dampers (TAC No. 66319), provided notification to the NRC of the completion of fire damper replacements).
- For fire areas with combustible loading less than one hour, an analysis was performed which demonstrated the acceptability of the existing sheet metal ductwork (taking no credit for the dampers). These evaluations were documented in the December 19, 1989, letter to NRC as EV-1 through EV-8, which summarized the results of design analyses 8700-DMC-2341 and 2345.

Based on the December 19, 1989, submittal and the commitments identified, the staff reviewed the fire dampers as deviations from conformance to Appendix A of BTP 9.5-1, and ultimately found the deviations acceptable (NRC letter dated June 29, 1990 (TAC 66319)).

The BVPS-1 letter dated July 22, 1991, (TAC No. 66319) provided notification to the NRC of the completion of the fire damper replacement effort identified previously in the BVPS-1 letter dated December 19, 1989.

The following conditions were cited as the bases for the deviation relative to the unqualified fire dampers:

- Fire loading in the areas with the unqualified dampers is less than one hour. Based on NFPA 90A, Section 3-3.1.1, no fire damper is required in ductwork passing through a 1-hour fire rated wall. Therefore, for fire areas with less than 1-hour fire load, no damper is required.

BVPS-1

Licensing Action #: 11.19

Licensing Action: Fire Dampers - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

- Sheet metal ductwork .022 inch (24 gauge) has been successfully tested to withstand 1700F for a duration of one hour.
- Analysis shows that the estimated temperature on the opposite side of the ductwork due to the fire is less than the temperature that will cause collapse of the ductwork.

Evaluation:

The NRC letter dated June 29, 1990, states:

DLC letter dated December 19, 1989, reaffirmed the commitment to replace during the next BVPS-1 refueling outage, unqualified fire dampers in those areas with combustible loadings exceeding 1-hour, and to maintain compensatory fire watches until then. That letter also presented engineering evaluations for the remaining unqualified fire dampers. DLC judged the results of the engineering evaluations to be satisfactory and concluded that those remaining fire dampers need not be replaced and that the compensatory measures were no longer needed.

A cursory examination of the DLC methodology shows it to be similar to that previously approved by the staff for the Susquehanna facility. Based on this similarity, the staff has no objection to DLC's corrective actions and schedule.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- 2701.620-000-045, Revision A, "Fact-Finding Report on Air Duct Penetration through One Hour Fire Resistive Wall Assembly."
- 85-01-14, "Appendix R - Additional Exemption Requests."
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)."
- 8700-B-084, Revision 12, "Fire Hazards Analysis."
- 8700-DMC-2341, Revision 1, "Basis for Exemption of Non-Qualified Fire Damper VS-D-263 and VS-D-266."
- 8700-DMC-2345, Revision 0, "Determination of Area Temperature as a Result of a Fire in Auxiliary Building Elevation 768'-7"."
- 89-12-19, "BVPS-1 (TAC 56566) - Fire Damper Engineering Evaluations."

BVPS-1

Licensing Action #: 11.19

Licensing Action: Fire Dampers - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

- 90-06-29, "BVPS-1 - Unqualified Fire Damper Engineering Evaluation (TAC 66319)."
- 91-07-22, "Beaver Valley Power Station Unit 1 Unqualified Fire Dampers."
- FPPCE 12-024, Revision 0, "G.L. 86-10 Evaluations for Unqualified Fire Dampers."
- NFPA 90A, Revision 1989, "Standard for the Installation of Air-Conditioning and Ventilating Systems."
- UFPARR, Revision 30, "Updated Fire Protection Appendix R Review."

Associations:

None

BVPS-1

Licensing Action #: 11.20

Licensing Action: 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)

Basis Date: December 4, 1986

To Be Transitioned?: No

Basis:

The BVPS-1 letter dated January 14, 1985, submitted the exemption request that modifies previous submittals for the Primary Auxiliary Building (713'-6", 1-PA-1G) identified in Licensing Action Nos. 3, 6, and 7. This submittal redefined the 713'-6", 1-PA-1G as a single fire compartment due to interconnecting ventilation and identified separation issues with the charging pumps. Supplemental submittals, dated October 16, 1985, and October 28, 1986, were provided to support the justification for the subject configurations.

III.G.2.b requires separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire compartment.

Attachment 3 of the BVPS-1 submittal dated January 14, 1985, identified that the 713'-6", 1-PA-1G was redefined as a single fire compartment due to the ventilation system and open ventilation chase traversing through the building. Charging pump cubicles cannot be totally sealed off due to the need for ventilation openings. The 713'-6", 1-PA-1G compartment is not completely protected by fire detection or an automatic suppression system.

The potentially affected safe shutdown equipment from a fire in the Primary Auxiliary Building (713'-6", 1-PA-1G) is 1-PA-1GA, 1-PA-1GB, and 1-PA-1GC (High Head Safety Injection - Charging Pumps).

The exemption for the Primary Auxiliary Building was approved and documented in the NRC SER dated December 4, 1986 (TAC 56566).

The following conditions were cited in the NRC SER dated December 4, 1986, as the basis for approval of the exemption request relative to fire compartment (713'-6", 1-PA-1G):

- A fire of significant duration or magnitude is not expected to occur because combustible loading in the pump cubicles and surrounding portion of the (1-PA-1G) is moderate to light.
- Intervening combustibles between the redundant charging pumps are only in the corridor outside the charging pump cubicles and do not extend into the ventilation openings; therefore, they do not provide a complete fire propagation path.
- A fire in the charging pump cubicles would be detected and annunciate in the Control Room.
- A fire on the 722' elevation outside the charging pump cubicles would not affect pump B because it is separated from other portions of this level by 3-hour barriers on that elevation and lack of fire propagation path via intervening combustibles.

BVPS-1

Licensing Action #: 11.20

Licensing Action: 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)

Evaluation:

The NRC SER dated December 4, 1986, states:

We have completed our review of your request. Enclosure 1 is the document granting all three exemptions you requested, as well as approving one deviation from our guidelines. Exemptions are granted for:

(1) charging pump cubicles separation and fire suppression,

The SER further states:

Based on the review of the licensee's analysis, the staff concludes that:

- *The separation of redundant trains of charging pumps by more than 20 feet of horizontal distance free of intervening combustibles in the adjacent corridor and the installation of automatic fire suppression systems would not significantly increase the level of fire protection in the charging pump cubicles. Therefore, the requested exemption can be granted.*

Enclosure 2 of the SER states:

4.0 Charging Pump Cubicle A (Fire Zone PA-1F). Charging Pump Cubicle B (Fire Zone PA-1G), and Charging Pump Cubicle C (Fire Zone PA-1H)

4.1 Exemption Requested

Exemptions were requested from Section III.G.2.b to the extent that it requires separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards, and to the extent that it requires an automatic fire suppression system to be installed throughout the fire area.

The SER also states:

4.3 Evaluation

The fire protection in the charging pump cubicles does not comply with the technical requirements of Section III.G.2.b of Appendix R because redundant trains of cables and equipment and associated nonsafety circuits are not separated by 20 feet of horizontal distance free of intervening combustibles, and an automatic fire suppression system has not been installed.

The primary concern was that even though redundant charging pumps are separated by a horizontal distance of more than 20 feet, the presence of intervening combustibles in the corridor and the absence of automatic fire suppression systems in or around the pump cubicles may result in a loss of safe shutdown capability.

A fire of significant duration or magnitude is not expected to occur on elevation 722 feet, 6 inches because the combustible loading in the pump cubicles and the surrounding portions of the PAB is moderate to light. In addition, the intervening

BVPS-1

Licensing Action #: 11.20

Licensing Action: 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)

combustibles between redundant pumps are only in the corridor outside of the pump cubicles and do not extend into the ventilation openings. Therefore, they do not provide a complete fire propagation path between redundant pumps.

Should a fire occur in a pump cubicle, it is expected to be detected by the detectors which annunciate in the control room. The operators will dispatch the plant fire brigade to respond and extinguish the fire.

If the detectors do not operate, or if a fire should occur outside of a pump cubicle on the 722-foot, 6-inch level, it is expected that pump B would remain free of fire damage because it is separated from other portions of this level by barriers with at least a 3-hour fire resistance rating and because of the lack of a fire propagation path via intervening combustibles between pumps.

Should a fire occur on the 735-foot, 6-inch level, it is expected that at least one of the pumps would remain free of fire damage because pumps A and C are separated from this portion of the PAB by fire barriers with at least a 1-hour fire resistance rating. In addition, the fire is unlikely to propagate downward through the pump B cubicle personnel hatch. Pump B power cables are enclosed in 1-hour fire wrap.

Based on this evaluation, the staff concludes that with the installed fire protection features and the licensee-committed modifications, there is reasonable assurance that a fire originating in the PAB building will not prevent the plant from safely shutting down.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transmitted

References:

- 85-01-14, "Appendix R - Additional Exemption Requests."
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."

Associations:

None

BVPS-1

Licensing Action #: 11.21

Licensing Action: Control Room (1-CR-1/1-CR-2) - Lack of 20 foot Separation (III.G.2 criteria)

Basis Date: December 4, 1986

To Be Transitioned?: No

Basis:

The BVPS-1 letter dated January 14, 1985, submitted the exemption request that modifies previous submittals for Control Room (1-CR-1) and Control Room HVAC Equipment Room (1-CR-2) described in Licensing Action Nos. 11.01 and 11.08. This submittal redefined 1-CR-1 and 1-CR-2 as a single fire compartment due to interconnecting ventilation system and identified redundant emergency diesel generator circuits within the fire compartment.

Supplemental submittals, dated October 16, 1985, and October 28, 1986, were provided to support the justification for the subject configuration.

III.G.2.b requires separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire compartment.

Attachment 4 of the BVPS-1 submittal dated January 14, 1985, identified that the Control Room (1-CR-1) and Control Room HVAC Equipment Room (1-CR-2) were redefined as a single fire compartment (1-CR-1/1-CR-2) due to the interconnecting ventilation system. In addition, the control room compartment is not completely protected by an automatic suppression system.

The potentially affected safe shutdown equipment from a fire in the Control Room (1-CR-1) and Control Room HVAC Equipment Room (1-CR-2) includes:

- Redundant safe shutdown circuits associated with the emergency diesel generators.
- HVAC equipment for the Control Room.

The exemption for fire compartment 1-CR-1/1-CR-2 was approved and documented in the NRC SER dated December 4, 1986 (TAC 56566).

The following conditions were cited in the NRC SER dated December 4, 1986, as the basis for approval of the exemption request relative to fire compartment 1-CR-1/1-CR-2:

- The combined vertical and horizontal distance between the redundant systems is more than 65 feet.
- The intervening combustibles in the control room are located above the level of train A control circuits, but not in the ducts or duct shaft.
- A fire would have to propagate up the duct shaft, across the ceiling of the control room, and down to the benchboard where the train A circuits are located.
- The combustible loading is light. There are no combustibles in the ventilation shaft.
- Both rooms are protected by fire detectors.

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Licensing Action #: 11.21

Licensing Action: Control Room (1-CR-1/1-CR-2) - Lack of 20 foot Separation (III.G.2 criteria)

- The control room is constantly attended.

Evaluation:

The NRC SER dated December 4, 1986, states:

We have completed our review of your request. Enclosure 1 is the document granting all three exemptions you requested, as well as approving one deviation from our guidelines. Exemptions are granted for:

(1) charging pump cubicles separation and fire suppression,

Enclosure 1 states:

Based on the review of the licensee's analysis, the staff concludes that:

- *The separation of redundant trains of charging pumps by more than 20 feet of horizontal distance free of intervening combustibles in the adjacent corridor and the installation of automatic fire suppression systems would not significantly increase the level of fire protection in the charging pump cubicles. Therefore, the requested exemption can be granted.*

Enclosure 2 states:

5.0 Control Room (Fire Zones CR-1 and CR-2)

5.1 Exemption Requested

An exemption was requested from Section III.G.2.b to the extent that it requires separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards, and to the extent that it requires an automatic fire suppression system to be installed throughout the fire area.

Enclosure 2 continues on to state:

5.3 Evaluation

The technical requirements of Section III.G.2.b of Appendix R are not met in these zones because redundant emergency diesel generator circuits are not separated by a horizontal distance of more than 20 feet free of intervening combustibles or fire hazards, and because an automatic fire suppression system is not installed throughout the fire zones.

The staff's principal concern was that the presence of intervening combustibles between train A emergency diesel generator control circuits and the train B emergency diesel generator power cables, and the lack of fire suppression systems throughout the control room complex may result in a loss of redundant safe shutdown capability.

However, the combined vertical and horizontal distance between the redundant systems is more than 65 feet. The intervening combustibles in the control room are

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Licensing Action: Control Room (1-CR-1/1-CR-2) - Lack of 20 foot Separation (III.G.2 criteria)

located above the level of train A control circuits, but not in the ducts or duct shaft. Therefore, it is unlikely that a fire would spread between redundant circuits.

To spread via the intervening combustibles from the train B power cables to the room below, a fire would have to propagate up the duct shaft, across the ceiling of the control room, and down to the bench board where the train A circuits are located. This mode of fire spread is unlikely because the combustible loading in these two rooms is light, both are protected by fire detectors throughout, there are no combustibles in the shaft, and the control room is constantly attended.

If a fire were to occur in one of these rooms, the staff has reasonable assurance that it would be detected by the fire detectors or the operators. Detector actuation would be annunciated in the control room and the operators would dispatch the plant fire brigade to extinguish the fire.

5.4 Conclusion

Based on the above evaluation, the staff concludes that the above-mentioned fire protection features provide a level of fire protection equivalent to the technical requirements of Section III.G.2.b of Appendix R. Therefore, the exemption request for the aforementioned diesel generator circuits and a fire suppression system in the control room complex should be granted.

Based on the above evaluation, the staff concludes that the above-mentioned fire protection features provide a level of fire protection equivalent to the technical requirements of Section III.G.2.b of Appendix R. Therefore, the exemption request for the aforementioned diesel generator circuits and a fire suppression system in the control room complex should be granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 1/2-ADM-1900, Revision 24, "Fire Protection Program."
- 10080-DEC-3560, Revision 0, Addendum 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning."
- 1OM-56C.4.B, Revision 31, "Shift Manager Procedure."
- 1OST-33.16, Revision 14, "Smoke Detector Instrumentation Test."
- 85-01-14, "Appendix R - Additional Exemption Requests."
- 85-10-31, "BVPS-1 Special Report."

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Licensing Action #: 11.21

Licensing Action: Control Room (1-CR-1/1-CR-2) - Lack of 20 foot Separation (III.G.2 criteria)

- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)."
- 8700-RE-0027A, Revision 40, "Arrangement - Control and Computer Rooms."
- 8700-RE-0047A, Revision 49, Addendum 1, "Conduit Plan & Details Control Room."

Associations:

None

BVPS-1

Licensing Action #: 11.22

Licensing Action: Main Steam Valve Room (1-MS-1) - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

Basis Date: December 4, 1986

To Be Transitioned?: No

Basis:

The BVPS-1 letter dated January 14, 1985, submitted the exemption request for the Main Steam Valve Room (1-MS-1). Supplemental submittals, dated October 16, 1985, and October 28, 1986, were provided to support the justification for the subject configuration.

The steam generator atmospheric dump valves (PCV-MS101A, B, and C), main steam isolation valves (TV-MS101A, B, and C), steam supply trip valves for the auxiliary feedwater (AFW) pump, MOV-MS105 and TV-MS105A and B, and the residual heat release valve (HCV-MS104) are all located in this fire compartment and are used for safe shutdown. The residual heat release valve is used for control of decay heat release in conjunction with the atmospheric steam dump valves.

III.G.2.b requires separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire compartment.

Attachment 5 of the BVPS-1 submittal dated January 14, 1985, identified that the Main Steam Valve Room (1-MS-1) required an exemption from III.G.2 criteria of Appendix R because redundant trains of safe shutdown equipment and circuits are located in this fire compartment (1-MS-1). In addition, the Main Steam Valve Room is not protected by fire detection or an automatic suppression system.

The potentially affected safe shutdown equipment from a fire in the Main Steam Valve Room (1-MS-1) is the redundant safe shutdown circuits associated with decay heat removal capability. Redundant equipment including atmospheric dump valves, steam supply trip valves for the terry turbine, and residual heat release valve are located in this fire compartment.

The exemption request for Main Steam Valve Room (1-MS-1) was approved and documented in the NRC SER dated December 4, 1986 (TAC 56566).

The following conditions were cited in the NRC SER dated December 4, 1986, as the basis for approval of the exemption request relative to fire compartment 1-MS-1:

- The combustible loading is less than 30 minutes.
- Redundant valves are separated by at least 5 feet.
- The main steam safety valves do not require power or compressed air to operate, and should not be affected due to their size and low combustible loading.
- MOV-MS105 and the steam supply trip valves should fail to the safe (open) position, and the motor driven AFW pumps are also available.

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Licensing Action #: 11.22

Licensing Action: Main Steam Valve Room (1-MS-1) - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

- Fire damage to the main steam isolation valves can be overcome from outside the fire area by manually initiating a loss of air condition, which will cause the valves to close safe.

Evaluation:

The NRC SER dated December 4, 1986, states:

We have completed our review of your request. Enclosure 1 is the document granting all three exemptions you requested, as well as approving one deviation from our guidelines. Exemptions are granted for:

(3) main steam valve room equipment separation.

Enclosure 1 states:

Based on the review of the licensee's analysis, the staff concludes that:

- *The separation of redundant trains of charging pumps by more than 20 feet of horizontal distance free of intervening combustibles in the adjacent corridor and the installation of automatic fire suppression systems would not significantly increase the level of fire protection in the charging pump cubicles. Therefore, the requested exemption can be granted.*

Regarding the Main Steam Valve Room (Fire Area MS-1), enclosure 2 states:

6.1 Exemption Requested

An exemption was requested from Section III.G.2.a to the extent that it requires separation of cables and equipment and associated nonsafety circuits of redundant trains by a fire barrier having a 3-hour rating.

It continues on to state:

6.3 Evaluation

The technical requirements of Section III.G.2.a of Appendix R are not met in Fire Area MS-1 because redundant trains of equipment are not separated by a fire barrier having a 3-hour rating.

The staff was concerned that the lack of 3-hour fire rated barriers between redundant valves in this fire area may result in a loss of safe shutdown capability.

The valves in this room perform one of two safe shutdown functions:

- *Isolation of the main steam system (main steam isolation valves)*
- *Control of decay heat release (atmospheric dump valves, steam supply trip valves, RHR valves, and the code safety valves).*

The combustible loading in Fire Area MS-1 is low (less than 30 minutes). Redundant valves are separated by at least 5 feet. If a fire were to occur, it is not expected to result in a loss of safe shutdown capability for the following reasons:

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Licensing Action #: 11.22

Licensing Action: Main Steam Valve Room (1-MS-1) - Lack of 3-Hour Fire Barriers (III.G.2 criteria)

- *If the steam generator atmospheric dump valves and the RHR valve fail to open, the main steam safety valves would be available. These valves do not require power or compressed air to operate. Because of their size and construction and the combustible load in the room, they are not expected to be damaged by a fire.*
- *Should fire damage valve MOV-MS105 and the steam supply trip valves, these valves should fail to the safe open position and continue to supply steam to the turbine-driven AFW pump. In addition, two motor-driven AFW pumps are available.*
- *Fire damage to electrical controls for the main steam isolation valves can be overcome from outside of this fire area by manually initiating the 'loss of air' condition, which will cause these valves to close safe (the same as the electrical controls).*

Therefore, the staff has reasonable assurance that a fire originating in the Fire Area MS-1 will not prevent the plant from safely shutting down.

6.4 Conclusion

Based on the above evaluation, the staff concludes that the above-mentioned fire protection features provide a level of fire protection equivalent to the technical requirements of Section III.G.2.a of Appendix R. Therefore, the exemption request for Fire Area MS-1 should be granted.

Validation/Conclusions:

The Fire Compartment was evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 85-01-14, "Appendix R - Additional Exemption Requests."
- 86-12-04, "BVPS-1 - Transmittal of Fire Protection Technical Exemption (TAC 56566)."
- 8700-B-084, Revision 11, Addendum 1, "Fire Hazards Analysis."

Associations:

None

BVPS-1

Licensing Action #: 11.23

Licensing Action: Control Room (1-CR-1) - 72-Hour Cold Shutdown Requirement (III.L criteria)

Basis Date: March 14, 1983

To Be Transitioned?: No

Basis:

Section III.L specifies, in part, that the plant can achieve cold shutdown conditions within 72 hours. 1-CR-1 does not comply with Section III.L because alternate shutdown procedure using the water solid steam generator cooldown method is capable of achieving cold shutdown in approximately 127 hours rather than 72 hours.

The original exemption request for the Control Room was contained in Chapter 11 of the Appendix R Review Report transmitted by the BVPS-1 letter dated June 30, 1982. The safe shutdown methodology in the original Appendix R review did not provide for the use of RHR to achieve cold shutdown. As identified in a letter dated October 28, 1982, it was BVPS's position that Section III.L requiring cold shutdown within 72 hours is not applicable to BVPS-1.

Additional clarifications were provided to justify the alternate safe shutdown methodology for using the water solid steam generator cooldown method, which is capable of achieving cold shutdown in approximately 127 hours rather than 72 hours.

In the letter of December 10, 1982, responses were provided to the NRC questions. In response to question 4, regarding the time required to achieve cold shutdown, WCAP-15962, "Beaver Valley Unit One Natural Circulation Cooldown Analysis for Appendix R Safe Shutdown" was attached, which included a calculation estimating that it would take approximately 127 hours to cool down to 200F. The NRC SER dated January 5, 1983 approved certain exemptions subject to approval of the 72-hour cold shutdown exemption, which was not addressed in that SER. The exemption was granted in the NRC SER dated March 14, 1983.

BVPS-1 submittals that provided the bases for the exemption request were as follows:

- DLC letter dated June 30, 1982, Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12. [The original Fire Protection Appendix R Review was attached to this letter].
- DLC letter dated October 22, 1982, Supplemental Information to Fire Protection - Appendix R Review Report. [Clarification of the design of the Backup Indicating Panel].
- DLC letter dated October 28, 1982, Supplemental Information to Fire Protection Appendix R Review Report - Allowable Time to Achieve Cold Shutdown. [Contention that Section III.L not applicable to BVPS-1 and disagreement that the plant must demonstrate design capability for achieving cold shutdown within 72 hours. The safe shutdown method was further explained including the water solid steam generator].

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Licensing Action #: 11.23

Licensing Action: Control Room (1-CR-1) - 72-Hour Cold Shutdown Requirement (III.L criteria)

- DLC letter dated December 10, 1982, Supplemental Information to Fire Protection - Appendix R Review Report. [Summarized November 30, 1982 meeting with NRC. Cold shutdown achieved in 127 Hours. Auxiliary feedwater supply would be sufficient. Commitment to install remote source range indication, thermocouples vs. hot leg temperature, local steam pressure indication, and steam generator pressure vs. cold leg temperature].

The following conditions were cited in the NRC SER dated March 14, 1983, as the bases for the exemption approval.

- The licensee has permanently installed and hardwired a backup instrumentation panel for one train of equipment. The new backup indicating panel is electrically isolated from the control room.
- The control room is equipped with area fire detectors.
- Plant technical specifications require continuous occupancy of the control room by the operators. Because the operators constitute a continuous fire watch, manual fire suppression in event of a fire would be prompt and effective.
- Cold shutdown capability can be achieved in 72 hours with use of the RHR, and can be achieved in 127 hours when offsite power and RHR are lost.
- A backup source of makeup water from the river is available for this function to continue indefinitely and the method is used only when offsite power and RHR are lost.

Evaluation:

The NRC SER dated January 5, 1983, states:

By submittals dated June 30, October 22 and October 28, 1982 the Licensee described the means by which safe shutdown can be achieved in the event of fire, and proposed modifications to the Beaver Valley Nuclear Power Station Unit 1 to meet the requirements of Appendix R to 10 CFR 50, Items III.G.3 and III.L. Additional information and clarification was obtained through a meeting held on November 30, 1982 and through telephone conference calls on December 6 and 9, 1982. The licensee subsequently documented his response in Letters dated December 10 and 21, 1982.

The licensee has provided safe shutdown analyses for the fire events and has demonstrated adequate redundancy in the proposed design of the Beaver Valley Nuclear Power Station Unit 1. The proposed modifications resolve previous SER open items on alternate shutdown.

The NRC concluded that:

The goals of reactivity control, inventory control, decay heat removal and pressure control are met except for the deviation from the 72-hour cold-shutdown criterion

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Licensing Action #: 11.23

Licensing Action: Control Room (1-CR-1) - 72-Hour Cold Shutdown Requirement (III.L criteria)

(127 hours with only onsite power). The staff finds this extended time acceptable. The goals of process monitoring and adequate support systems have been met. Therefore, based on our review we conclude that the proposed Beaver Valley Nuclear Power Station Unit 1 design meets the requirements of Appendix R to 10 CFR Part 50 Items III.G.3 and III.L with respect to safe shutdown in the event of a fire, in the areas identified in the licensee's proposed modifications. This conclusion is contingent upon the granting of exemption to the 72-hour cold-shutdown requirement. We further conclude that the alternate shutdown open items in our SER dated May 3, 1979 are considered to be resolved.

In the section titled "Cold Shutdown Capability," the NRC SER dated March 14, 1983, states:

The licensee has requested an exemption from the 72-hour requirement to achieve cold shutdown, per Section III.L of Appendix R. The licensee proposed to use the method of solid steam generator to achieve cold shutdown only when the RHR system is not available. It will need 127 hours to achieve cold shutdown. Since this method is used only when offsite power and RHR are lost, we consider the extended cold shutdown time, from 72 hours to 127 hours, acceptable.

This exemption should be granted.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- 82-06-30, "Fire Protection - Response to Appendix R Requirements and Generic Letter 81-12."
- 82-10-22, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 82-10-28, "Supplemental Information to Fire Protection - Appendix R Review Report: Allowable Time to Achieve Cold Shutdown."
- 82-12-10, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 82-12-21, "Appendix R~ to 10 CFR 50 - Exemptions."

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Licensing Action #: 11.23

Licensing Action: Control Room (1-CR-1) - 72-Hour Cold Shutdown Requirement (III.L criteria)

- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 83-03-14, "BVPS-1 - Request for Exemption from Some Requirements of Appendix R to 10 CFR Part 50."

Associations:

None

BVPS-1

Licensing Action #: 11.24

Licensing Action: Process Instrumentation - Alternative Shutdown Capability (III.G.3 criteria and III.L criteria)

Basis Date: January 5, 1983

To Be Transitioned?: Yes

Basis:

The BVPS-1 submittal of December 10, 1982, documented an agreement to install portable source range monitoring indication external to the Backup Indicating Panel (BIP) with the ability to hook up within one hour after the time at which source range indication would be available after a reactor trip. As documented in TER-013882, since the source range indication normally becomes available 20 minutes after a reactor trip, the total time to provide source range indication at the backup indicating panel is approximately 80 minutes. SSD RAI 07
The BVPS-1 submittal of December 10, 1982, also documented an agreement to provide local steam pressure indication as an alternative to RCS cold leg temperature. These two deviations were accepted via the NRC SER dated January 5, 1983.

The BVPS-1 letter dated December 10, 1982, Supplemental Information to Fire Protection - Appendix R Review Report, summarized a meeting with the NRC on November 30, 1982, relative to the following topics: cold shutdown achieved in 127 hours; auxiliary feedwater supply; commitment to install remote source range indication; and thermocouples vs. hot leg temperature; local steam pressure indication; and steam generator pressure vs. cold leg temperature.

The BVPS-1 letter dated January 14, 1985, provided clarifications of design changes and documented deviations for process instrumentation. Enclosure IV of the January 14, 1985, submittal documents the deviations from the NRC staff position on the instrumentation necessary to achieve safe shutdown, and it states that the following instrumentation is required per interpretation of Section III.L:

- Pressurizer pressure.
- Pressurizer level.
- Reactor Coolant Hot Leg Temperature or Core Exit Thermocouple.
- Reactor Coolant Cold Leg Temperature.
- Steam generator pressure.
- Wide range SG level.
- Source range flux.
- Level indication for all tanks used.
- Diagnostic Instrumentation for Shutdown Systems.

The instrumentation on the Backup Indicating Panel (BIP) is in accordance with NRC staff guidance on instrumentation necessary to achieve safe shutdown, such as IE Information Notice 84-09, with the following deviations:

- Reactor coolant system pressure vs. pressurizer pressure.

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Licensing Action #: 11.24

Licensing Action: Process Instrumentation - Alternative Shutdown Capability (III.G.3 criteria and III.L criteria)

- Steam generator level - narrow range versus wide range.
- No direct level indication for RWST.
- Ganged instruments (i.e., one indicator for several sensors).
- Local main steam line pressure vs. steam generator pressure.
- Source range monitor is not permanently installed. Portable drawer can be hooked up within one hour after the time at which source range indication would be available after a reactor trip.

Evaluation:

The NRC SER dated January 5, 1983 states:

The alternate shutdown method will be accomplished by procedural means, with actions performed at local shutdown stations or locally at the equipment. The licensee has provided a summary of the functions for which alternate shutdown methods may be needed, and the manual actions required to accomplish each of the identified functions which have been described. Alternate process monitoring capability will be achieved through the installation of a backup indication panel in the east cable vault. The required instrumentation for process variables are available at the backup indication panel. The licensee will install a local steam pressure indicator in the atmospheric dump valve area for manual control of the steam pressure during post-fire shutdown.

The SER also states:

A. Performance Goals:

The performance goals for post-fire safe shutdown for reactivity control, reactor coolant makeup, reactor coolant pressure control and decay heat removal can be met using the existing systems and equipment listed in Section A above, including the new auxiliary feedwater pump.

The control of these functions can be accomplished using the alternate shutdown methods, or the control room, depending on the location of the fire. The licensee's alternate shutdown method relies on procedures and actions at local shutdown stations or equipment.

The process-monitoring capability will be provided on the backup indication panel for reactor hot and cold leg temperatures, pressurizer pressure and level, steam generator level and source range flux monitor. Steam pressure will be monitored locally. Requirements to read other local indications for tank levels and diagnostic pressure, temperature or flow indications of support systems will be included in the shutdown procedures. The installed source range instrument drawer at the backup indication panel (BIP) will have the ability to be hooked up to the source range monitor within one hour.

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Licensing Action: Process Instrumentation - Alternative Shutdown Capability (III.G.3 criteria and III.L criteria)

The available support systems for post-fire safe shutdown are the redundant diesel generators, vital buses, reactor plant river water system, portable gasoline-powered fans for three areas and power supply for the backup indication panel.

The conclusion states:

The goals of reactivity control, inventory control, decay heat removal and pressure control are met except for the deviation from the 72-hour cold-shutdown criterion (127 hours with only onsite power). The staff finds this extended time acceptable. The goals of process monitoring and adequate support systems have been met. Therefore, based on our review we conclude that the proposed Beaver Valley Nuclear Power Station Unit 1 design meets the requirements of Appendix R to 10 CFR Part 50 Items III.G.3 and III.L with respect to safe shutdown in the event of a fire, in the areas identified in the licensee's proposed modifications. This conclusion is contingent upon the granting of exemption to the 72-hour cold-shutdown requirement. We further conclude that the alternate shutdown open items in our SER dated May 3, 1979 are considered to be resolved.

Validation/Conclusions:

Conformance with the Appendix R exemption bases reached with the NRC regarding process instrumentation - alternative shutdown capability [III.G.3 and III.L criteria], as stated in the NRC SER dated January 5, 1983, was verified. 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 indicating 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.

Disposition:

Licensing Action acceptable for transition

References:

- 1OM-56C.4.D, Revision 32, "Nuclear Operator #1 Procedure."
- 1OM-56C.4.F-1, Revision 22, "Backup Indicator Panel Activation."
- 82-12-10, "Supplemental Information to Fire Protection - Appendix R Review Report."
- 83-01-05, "SER for Appendix R to 10 CFR Part 50, Items III.G and III.L - BVPS-1."
- 85-01-14, "Appendix R - Additional Exemption Requests."
- 8700-RE-0025DB, Revision 1, "Outline Backup Indicating Panel."
- TER-13882, Revision 0, "Clarification of Setup Time for Backup Indicating Panel Source Range Drawer."

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Licensing Action #: 11.24

Licensing Action: Process Instrumentation - Alternative Shutdown Capability (III.G.3 criteria and III.L criteria)

- UFPARR, Revision 30, "Updated Fire Protection Appendix R Review."
- UFSAR, Revision 29, "BVPS-1 Updated Final Safety Analysis Report."

Associations:

Ch.2 - NEI Section: 3.1.2.5
Ch.4 - Compartment: 1-CR-4
Ch.4 - Compartment: 1-CS-1
Ch.4 - Compartment: 1-MS-1
Ch.4 - Compartment: 3-CR-1

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Licensing Action #: 11.25

Licensing Action: Emergency Lighting - Lack of 8-Hour Battery Powered Emergency Lighting Units (III.J criteria)

Basis Date: July 27, 1987

To Be Transitioned?: No

Basis:

Section III.J of Appendix R to 10 CFR 50 requires 8-hour battery-powered emergency lighting units in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

Per the BVPS-1 letter of January 21, 1986, an exemption was requested from the technical requirements of Section III.J of Appendix R to 10 CFR 50 based on the results of an NRC inspection conducted the week of November 18, 1985. The inspection identified an apparent violation for use of security perimeter lighting for outside areas, 2-hour battery pack light for the brigade room, and lack of emergency lighting in the clean shop. An emergency light was installed in the clean shop and additional lights were installed on the turbine deck.

Per the BVPS-1 letter dated October 21, 1986, an additional exemption was requested from the technical requirements of Section III.J of Appendix R to 10 CFR 50, concerning the need for 8-hour battery-powered lighting units in areas having safe shutdown equipment and along access/egress routes.

The reason for requiring 8-hour battery-powered emergency lighting is to ensure that at least minimum lighting is available for the performance of manual actions necessary for safe shutdown after a fire. The licensee requested the exemption to allow the use of the following:

- Security perimeter lighting backed up by the security diesel generator is used for outdoor access/egress paths.
- Portable flashlights are required to enhance the permanent 8-hour battery-powered lighting for certain areas, including intake structure, turbine deck, PAB, service building roof, normal switchgear, emergency switchgear, and process rack area.
- The fire brigade room has 2-hour battery-powered emergency lighting.
- The NRC letter dated July 27, 1987, Transmittal of Appendix R Technical Exemption Regarding Emergency Lighting (TAC 60625), provided the approval of the exemption requests noted above. The following conditions were cited in the NRC SER dated July 27, 1987 as the basis for approval of the exemptions relative to emergency lighting:
- The security emergency diesel generator has a fuel supply for at least 24 hours.
- The security perimeter lighting circuits are not routed through fire areas where safe shutdown equipment or cables are located.

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Licensing Action: Emergency Lighting - Lack of 8-Hour Battery Powered Emergency Lighting Units (III.J criteria)

- A control room evacuation would not be required for a fire in Turbine Building (1-TB-1) or Normal Switchgear Room (1-NS-1). The security diesel and transfer circuits are independent of all other fire areas of Appendix R concern.
- IES Handbook (Referenced in GL 85-01) accepts the use of portable lighting to supplement fixed d-c units.
- Operator actions requiring flashlights are hands-free activities or require one hand.
- The expected time duration for use of the fire brigade room as a staging area would be less than 30 minutes; therefore, 2-hour lighting is acceptable.
- The turbine deck has 8-hour battery-powered lighting units for access/egress around the brigade room.
- The fire brigade room was relocated from the Turbine Deck to the Security Building. The conditions of the exemption are still met because the brigade room has two hour battery-powered emergency lighting in its present location and access to the Brigade Room is lit by security perimeter lighting.

Evaluation:

The NRC SER dated July 27, 1987, states:

Accordingly, the Commission has determined that pursuant to 10 CFR 50.12(a), the exemption as described in Section III is authorized by law and will not present an undue risk to the public health and safety and are consistent with common defense and security, and special circumstances are present for the exemptions in that application of the regulation in these particular circumstances is not necessary to achieve the underlying purposes of Appendix R to 10 CFR Part 50. Therefore, the Commission hereby grants the following exemption for the items mentioned in Section III above from the requirements of Section III.J of Appendix R to 10 CFR Part 50 concerning the need for 8-hour battery-powered lighting units in areas having safe shutdown equipment and along access/egress routes as follows:

1. Security perimeter lighting for outside yard area access/egress routes may be used,

2. Portable, hand-held lighting units may be used for plant areas as specified in the licensee's submittal provided the licensee provide the hand-held lights as part of the dedicated supplies required for alternate safe shutdown, and

3. Two-hour battery-powered emergency lighting in the fire brigade room may be used.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of the exemption will have no significant impact on the environment (52 FR 27892).

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Licensing Action: Emergency Lighting - Lack of 8-Hour Battery Powered Emergency Lighting Units (III.J criteria)

Validation/Conclusions:

An 8-hour Battery Powered Emergency Lighting is no longer required by NFPA 805; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 86-01-21, "BVPS-1 Appendix R - Exemption Request: Emergency Lighting."
- 87-07-27, "BVPS-1 - Transmittal of Appendix R Technical Exemption Regarding Emergency Lighting (TAC 60625)."

Associations:

None

BVPS-1

Licensing Action #: 11.26

Licensing Action: Cable Spreading Room (1-CS-1) - Lack of Fire Extinguishers

Basis Date: June 6, 1979

To Be Transitioned?: Yes

Basis:

The NRC letter dated June 6, 1979, issued an enclosed Amendment No. 18 for BVPS-1's "Fire Protection Safety Evaluation Report" dated May 3, 1979. The amendment 18 contains the evaluations and conclusions regarding the fire protection program at BVPS-1. Section 5.6 contained the evaluation for fire compartment 1-CS-1, cable spreading room.

The potentially affected safe shutdown equipment from a fire in the Cable Spreading Room (1-CS-1) is as follows:

- The cable spreading compartment contains safety related redundant instrument, control, and power cables that are required for attaining safe shutdown.
- Emergency powered redundant supply and exhaust fans for the emergency switchgear and battery rooms.

The exemption for the lack of portable extinguishers in the cable tray mezzanine (1-CS-1) was approved and documented in the NRC letter dated June 6, 1979.

The following condition was cited in the letter as the bases for the exemption approval relative to the Cable Spreading Room (1-CS-1):

- Water coverage could be provided for the cable tray mezzanine from hose racks in the PCA and clean shops by adding additional lengths of fire hose.

Evaluation:

The NRC letter dated June 6, 1979, states:

5.6.5. Adequacy of Fire Protection

The ionization type smoke detector provides rapid response to incipient fires in cable trays. The initial shot for CO2 flooding is actuated by temperature detection with manual actuation capability. The second shot is manual actuation. However, a backup water suppression system is desirable to assure that cables required for safe shutdown would not be damaged should the CO2 system fail to extinguish the fire. Lockout switches as well as CO2 predischarge alarms and odorizers are provided for personnel protection. The cable tray mezzanine does not have portable extinguishers, however, water coverage could be provided for the cable tray mezzanine and cable vaults from hose racks in the PCA and clean shops by adding additional lengths of fire hose."

Validation/Conclusions:

Conformance with the Appendix R exemption bases reached with the NRC regarding lack of fire extinguishers in 1-CS-1, as stated in the NRC letter dated June 6, 1979, was verified. The exemption for the subject fire extinguishers is being transitioned to the new licensing basis under NFPA 805.

BVPS-1

Licensing Action #: 11.26

Licensing Action: Cable Spreading Room (1-CS-1) - Lack of Fire Extinguishers

LIC (5)

Disposition:

Licensing Action acceptable for transition

References:

- 79-06-06, "SER by the Office of Nuclear Reactor Regulation Related to Amendment No. 18 to Facility Operating License No. DPR-66."
- 1PFP-SRVB-725, Revision 3, "Cable Tray Mezzanine."
- FPPCE 15-028, Revision 2, "Fire Extinguisher Evaluation."

Associations:

Ch. 3 - Section 3.7 / Subsection: 3.7
Ch. 4 - Compartment: 1-CS-1

BVPS-2

Licensing Action #: 01

Licensing Action: Fire Brigade - Annual Physical Examinations - BTP C.3.b

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, Item C.3.b, states:

The Standard Review Plan states that the qualification of fire brigade members should include an annual physical examination to determine their ability to perform strenuous fire- fighting activities.

Differences from the SRP:

As a minimum, physical examinations will be conducted for the fire brigade every 3 years, and each member's records will be reviewed annually by the Medical Department.

Justification:

This procedure was established and approved for BVPS-1 and has been in effect since 1976 without any problems. The physical examination (nuclear physical) given to the fire brigade members is the same examination given to all workers involved in radiological work at the site. This examination is far more extensive than the examination required for nonradiological workers. Fire brigade members who become physically unfit to perform their function on the fire brigade are reviewed at the time their physical inability occurs, in accordance with company policy, and corrective action is taken. The annual review is merely a confirmation that no physical problems relating to a fire brigade member have been overlooked. If the latter occurs, immediate corrective action is taken.

The following conditions were cited in the NRC SER (NUREG-1057) as the bases for the deviation approval relative to the fire brigade:

- Physical examinations of the fire brigade members will be provided every three years instead of annually as specified in the staff guidelines.
- Each fire brigade member's medical records will be reviewed annually to determine fitness for strenuous firefighting activity.

Evaluation:

Section 9.5.1.3 of the SER, NUREG-1057 states:

The applicant proposes to give physical examinations to the fire brigade members every 3 years instead of annually as specified in the staff guidelines. Each fire brigade member's medical records will be reviewed annually to determine fitness for strenuous firefighting activity.

This procedure was approved for the Unit 1 fire brigade in 1976 and has operated successfully since then.

BVPS-2

Licensing Action #: 01

Licensing Action: Fire Brigade - Annual Physical Examinations - BTP C.3.b

On the basis of its evaluation and previous approval, the staff concludes that this is an acceptable deviation from the guidelines in Section C.3 of BTP CMEB 9.5-1.

Procedure 1-2-ADM-1902, "Fire Brigade," details the interval between physical exams and requires fire brigade physicals every year.

Validation/Conclusions:

Compliance with criteria was established to provide annual physical examinations of the fire brigade members; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned.

References:

- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."

Associations:

None

BVPS-2

Licensing Action #: 02

Licensing Action: Structural Steel - Lack of Structural Steel Fireproofing - BTP C.5.a(1)

Basis Date: August 1987 (NUREG-1057, Supplement 6)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.a(1), reports:

The Standard Review Plan states that fire barriers with a minimum fire resistance rating of 3 hours should be provided 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 fires.

Difference from the SRP:

The structural steel supporting the 3-hour fire-rated concrete block walls which separate the 780 ft-6 in. el of the service building (SB-5) from the turbine building (TB-1) and the 773 ft-6 in. el of the auxiliary building (PA-5) and which separate PA-5 from the radiation protection area (WH-2) and TB-1 has not been fireproofed.

Justification:

The combustible loading in SB-5 is < 1/2 hour. The largest portion of that loading is the charcoal filters, which are all provided with manually actuated deluge spray systems and heat detection systems. There are no local concentrations of combustibles (stacks of cable trays) adjacent to the columns. Therefore, a fire in either of these areas will not be large enough to cause structural damage, and no safety-related equipment in these areas is required for safe-shutdown. Postulating failure of the steel, safe shutdown can still be achieved.

Clarification was provided by the licensee in letter dated February 11, 1987 based on a question from the NRC Fire Protection reviewer.

The NRC Fire Protection Reviewer requested additional information to ensure that failure of unprotected structural steel in the upper elevations of the Service and Auxiliary Buildings (Fire Areas SB-5 and PA-5) will have no adverse impact on the safe shutdown capability.

Response:

FSAR Appendix 9.5A provides results of the fire protection safe shutdown analysis for these areas and concludes that safe shutdown can be achieved assuming loss of all safe shutdown cables and equipment located in these areas.

FSAR Table 3.2-2 provides a summary of Seismic and QA Category I structures. As indicated in the referenced table, the Seismic Category I seismic

and tornado missile barriers located at the 780' elevation for the Service Building and at 773'-6" for the Auxiliary Building. These are the floor slabs in Fire Areas SB-5 and PA-5." "Failure of the structural steel above the tornado missile barriers will not cause damage to components below as the missile boundary is capable of withstanding collapse. In addition, FSAR Section 3.6B.1.3.4.3 states in part for the Service Building that '... if non-seismic Category I portions of the structure fail, no adverse effects on adjacent Seismic Category I structures or components will occur.'

In conclusion, the above information provides adequate justification for the SRP deviation on unprotected structural steel.

Evaluation:

NUREG-1057, BVPS-2 SSER, Supplement 5 states:

9.5.1.4 General Plant Guidelines

Branch Technical Position (BTP) CMEB 9.5-1, Section C.5.a(1) states that fire barriers with a minimum fire resistance rating of 3 hours should be provided to 'separate safety-related systems from any potential fire in non-safety-related areas that could affect their ability to perform their safety function' and to 'separate redundant divisions or trains of safety-related systems from each other so that both are not subject to damage from a single fire.'

In Amendment 14, the applicant stated that the structural steel supporting the 3-hour fire-rated walls that separate the 780-foot, 6-inch elevation of the service building (Fire Area SB-5) from the turbine building and the 773-foot, 6-inch elevation of the auxiliary building (Fire Area PA-5) from the turbine building and the health physics area have not been fireproofed. The staff was concerned that a fire in the turbine building or in the upper elevations of the service or auxiliary building could cause the steel to collapse, jeopardizing safe shutdown equipment in the surrounding areas. However, Appendix 9.5A to the FSAR demonstrates that the loss of safety-related equipment in areas adjacent to the unprotected steel would not affect the plant's ability to achieve a safe shutdown. In addition, Table 3.2.2 of the applicant's FSAR states that the floor slabs at the 773-foot, 6-inch and the 780-foot, 6-inch elevations, which are the fire boundaries directly below the unprotected steel in the service and auxiliary buildings, are rated as seismic Category I. Section 3.6.B1.3.4.3 of the FSAR states that if non-seismic Category I portions of the structure fail, no adverse effects on adjacent seismic Category I structures or components will occur. Therefore, if a fire caused the unprotected structural steel to collapse, the plant would still be able to achieve a safe shutdown. Considering this evaluation, the staff concludes that the lack of structural steel fireproofing in Fire Areas SB-5 and PA-5 does not adversely affect plant safety and is an acceptable deviation from Section C.5.a(1) of BTP CMEB 9.5-1.

Validation/Conclusions:

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

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Licensing Action #: 02

Licensing Action: Structural Steel - Lack of Structural Steel Fireproofing - BTP C.5.a(1)

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 6, "NRC SSER - NUREG-1057, Supplement 6 dated August 1987."

Associations:

None

BVPS-2

Licensing Action #: 03

Licensing Action: Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: Yes

Basis:

The BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Conduits/Penetration Seals states:

The Standard Review Plan states that openings inside conduit larger than 4 inches in diameter should be sealed at the fire barrier, and that openings inside conduit 4 inches or less in diameter should be sealed at the fire barrier unless the conduit extends at least 5 feet on each side of the fire barrier and is sealed either at both ends or at the fire barrier with noncombustible material to prevent the passage of smoke and hot gases.

Differences from the SRP:

a. Openings inside conduit greater than 4 inches in diameter may be sealed at the first access point on one side of the fire barrier with a fire seal material combined with a fire-wrap material encasing the conduit from the fire seal to the barrier.

b. The following criteria may be applied for internal conduit seals in conduit 4 inches or less in diameter to prevent the propagation of combustible products (smoke and hot gases).

Barriers will be evaluated to determine the need for sealing. The occupancy, safe shutdown equipment and existing fire protection features on each side of the barrier will be evaluated to determine the need for sealing to prevent smoke passage. The following conditions on each side will be used to determine the need for prevention of smoke passage.

1. If there is automatic suppression provided on both sides of the barrier, a fire of sufficient heat to cause combustion of cables inside the conduits or generation of excessive smoke outside the conduits would not be expected to develop. Therefore, sealing inside conduits would not be required.

2. If all equipment in the areas on both sides of the barrier is of the same division for safe shutdown or not required for safe shutdown, there is no need to seal. The area on a side of a barrier will be considered to have one division of safe shutdown in cases where the conduit of the redundant division is protected by a one hour rated wrap throughout the area.

3. For barriers where a potential for exposure of redundant safe shutdown trains exist, the following analysis will be made and sealing provided inside the conduit which could affect equipment of the redundant division by passage of smoke.

a) All conduits 3 inches to 4 inches in diameter will be sealed at the barrier or first opening on both sides of the barrier. This will prevent passage of smoke from either side into the adjacent area.

b) Conduits less than 3 inches in diameter will be sealed on any side of the barrier where the following conditions exist:

i) The conduit terminates in a panel or enclosure containing equipment within a 10 foot lineal run from the point it enters the area. If the conduit length is more than 10 feet in the area, the products of combustion would condense out inside the conduit and would not be expected to reach equipment.

ii) The panel or equipment in which the conduit terminates is required for safe shutdown or contains safe shutdown equipment. The effects of smoke and gases would be limited to the immediate enclosed area of conduit termination. Therefore, only those conduits connected to panels with safe shutdown equipment would have a potential for damage and affect safe shutdown.

If both of the above conditions exist on a side of the barrier, the conduit will be sealed on that side of the barrier to prevent the passage of smoke generated in the conduit on the other side (fire side) of the barrier. Each side of the barrier will be evaluated to the above two conditions to determine which conduits less than 3 inches in diameter must be sealed.

Fire protection engineering evaluations shall apply the revised internal conduit sealing criteria for specific conduit configurations based on plant specific fire severities, locations of safe shutdown equipment, and the availability of fire detection and suppression systems for barriers described in the Fire Protection Safe Shutdown Report for BVPS Unit 2 as providing separation of redundant trains of safe shutdown equipment.

Justification:

a. Openings inside conduit greater than 4 inches in diameter will be sealed at the barrier where possible. Due to clearance problems, there are specific cases where this cannot occur. For these cases, the installation of a fire seal at the first opening on one side of the barrier, combined with fire wrap from the seal to the barrier, effectively extends the fire barrier. This method provides the same degree of protection as would sealing at the barrier.

b. These sealing criteria are consistent with those documented in a letter from Cleveland Electric Illuminating (CEI, 1985) Perry Nuclear Power Plant to the NRC. The NRC (USNRC, 1985) stated that CEI'S conduit sealing criteria are an acceptable deviation from Section C.5.a(3) of BTP CMEB 9.5-1.

In addition, specific conduit configurations will be evaluated for sealing requirements based on plant specific fire severities, locations of safe shutdown equipment, availability of fire detection and suppression systems, and will be documented in fire protection engineering evaluations in accordance with guidance provided in Generic Letter 86-10. This provides a level of protection equivalent to BTP CMEB 9.5-1.

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Licensing Action #: 03

Licensing Action: Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3)

The BVPS-2 UFSAR, Penetration Seal Design states:

The Standard Review Plan states that penetration designs should utilize only noncombustible materials and should be qualified by tests. The penetration qualification tests should use the time-temperature exposure curve specified by ASTM E-119, 'Fire Test of Building Construction and Materials.'

Differences from the SRP:

Penetrations in fire barriers for ventilation ductwork are sealed with non-tested fire seals.

Justification:

a. Due to plant construction, a rated seal could not be installed in the ductwork passing between the Auxiliary Building 773'6" (Fire Area PA-5) and the Radiation Protection Building 786'6" (Fire Area WH-2). The penetration is in a 12" block wall which has two pieces of ductwork passing through it. Each duct has two 1 1/2 hour fire dampers located in it. Due to the spacing of the dampers and the thickness of the wall, one damper is located outside the wall. The ductwork will be fire wrapped with 1 hour. wrap from just beyond the fire damper to the opening and then flared to cover the face of the opening. To allow the damper in the wall to expand, the opening around the ductwork is filled with Kaowool. Both fire areas have a fire severity of less than 1/2 hour. Fire area WH-2 has an Automatic Sprinkler suppression system and Fire Area PA-5 is provided with an Automatic General Area fire detection system. Both systems provide alarms in the control room.

b. Due to plant construction, the penetration for the ductwork passing between the pipe tunnel el. 718'6" (Fire Area PT-1) and Cable Vault el. 735'6" (Fire Area CV-1) is not sealed in accordance with the fire damper manufacturer's requirements. The block out is in the 2 ft. thick concrete floor separating the two fire areas. There are two pieces of ductwork passing through this hole. The fire damper listing requires the retaining angle to extend over the opening and onto the floor. Since the two ducts are run side-by-side, this requirement cannot be met between the two ducts. A barrier is provided between the two ducts by filling the area with Kaowool, and the area above the retaining angles is covered with two layers (1 hr rating) of E54A fire wrap material. The combustible loading in the pipe tunnel is less than 1/2 hour and the area has a general area smoke detection system which alarms locally and in the Control Room. The Cable Vault el. 735'6" has a combustible loading of less than 2 hrs. and has an automatic CO2 suppression system.

c. The penetration for the ductwork passing between the Cable Vault el. 735'6" (Fire Area CV-1) and Cable Vault el. 755'6" (Fire Area CV-3) is not sealed in accordance with the fire damper manufacturers requirements because of plant configuration. The block out is in the 2 ft. thick concrete floor separating the two fire areas. Two pieces of ductwork pass through this hole. The fire damper listing requires the retaining angle to extend over the opening onto the floor. Since no floor exists in the area between the two ducts, this area was filled with Kaowool. The retaining angles

on top were covered with two layers (1 hr. rating) of E54A fire wrap material. Both areas are provided with automatic CO2 suppression systems.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

In the SER, the staff stated that the applicant would provide qualified penetration seals for all penetrations of fire-rated walls or floor/ceiling assemblies. In Amendment 14 of the FSAR, the applicant stated that because of installation problems, certain fire barrier penetrations could not be sealed per Section C.5.a(3) of BTP CMEB 9.5-1. The applicant identified approximately 18 penetrations, of 4-inch diameter or greater, which cannot be sealed at the barrier. The applicant proposed to seal these penetrations with fire-seal material at the first opening and wrap the conduit from the seal to the barrier with 1-hour fire-wrap material. Seventeen of the penetrations have detection and automatic suppression on both sides of the barrier. The remaining penetration has detection on both sides with automatic suppression on one side. The applicant also stated that certain penetrations throughout the plant which are less than 4 inches in diameter and extend less than 5 feet on either side of the barrier cannot be sealed at the barrier. For these cases, the applicant proposed to seal the penetration at the first opening on both sides of the barrier with a fire-seal material. During the site audit on January 27-30, 1987, seals of both configurations were reviewed in the field and were found to provide an adequate measure of sealing for penetrations in fire barriers when the Standard Review Plan (SRP) (NUREG-0800) cannot be met because of installation difficulties. Therefore, the method for sealing penetrations as identified in Amendment 14 to the FSAR is an acceptable deviation from Section C.5.a(3) of BTPCMEB 9.5-1 when installation difficulties do not allow sealing at the barrier.

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The deviation for conduit/penetration seals and penetration seal design is being transitioned to the new licensing basis per NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 1/2-PIP-M16, Revision 8, "Penetration Seals."
- 10080-B-085, Revision 14, "Fire Hazard Analysis."
- 10080-RB-0016H, Sheet 8, Revision 12, "Ventilation & Air Conditioning Reactor Containment Contiguous Areas."

- 10080-RB-0016J, Sheet 9, Revision 8, "Ventilation & Air Conditioning Reactor Containment Contiguous Areas."
- 10080-RB-0045G, Sheet 7, Revision 12, "Ventilation & Air Conditioning Auxiliary Building."
- 10080-RB-0077B, Sheet 2, Revision 12, "Building Services Waste Handling Building."
- 10080-RB-0077C, Sheet 3, Revision 15, "Building Services Waste Handling Building."
- 10080-RB-0077K, Sheet 10, Revision 4, "Ventilation & A/C Health Physics Area."
- 10080-RC-0037E, Sheet 5, Revision 8, "Wall Sections & Details Auxiliary Building."
- 10080-RE-0064AX, Revision 3, "Cable Block Diagram Fire Detection 2DGP-3 2DGP-4."
- 10080-RE-0064AZ, Revision 5, "Cable Block Diagram - Fire Detection 2DGP-7."
- 10080-RM-0433-002A, Revision 17, "Valve Operation Number Diagram - CO2 Fire Protection System."
- 10080-RM-0433-001F, Revision 10, "Valve Operation Number Diagram Fire Protection Water Conditioning Polishing Building/Waste Handling Building/Yard."
- 10080-TLD-033C-081-03, Revision 2, "Test Loop Diagram Fire Protection-Water PT Interface/Turbine Building & Waste Handling Building."
- 10080-TLD-033D-040-03, Revision 4, "Test Loop Diagram Station Fire Detection System Zone 40 CV Smoke Detection."
- 10080-TLD-033D-057-03, Revision 5, "Test Loop Diagram Station Fire Detection System Zone 57 Auxiliary Building Smoke Detection."
- 2601.337-844-083, Revision B, "Internal Conduit Fire Seals EC-1 thru 6."
- 2OST-33.35, Revision 2, "Fire Rated Assemblies Visual Inspection."
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.3 - Section: 3.11 / Subsection: 3.11.1
Ch.3 - Section: 3.11 / Subsection: 3.11.4
Ch.4 - Compartment: 2-CV-1
Ch.4 - Compartment: 2-CV-3

BVPS-2

Licensing Action #: 03

Licensing Action: Conduits/Penetration Seals & Penetration Seal Design - BTP C.5.a(3)

Ch.4 - Compartment: 2-PA-5
Ch.4 - Compartment: 2-PT-1
Ch.4 - Compartment: 2-WH-1
Fire Protection - Fire Compartment: 2-CV-1 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-CV-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-CV-3 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-CV-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-5 / Form: Detection
Fire Protection - Fire Compartment: 2-PA-5 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PT-1 / Form: Detection
Fire Protection - Fire Compartment: 2-PT-1 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-SB-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-3 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-4 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-5 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-WH-1 / Form: Passive Protection

LIC (6)

BVPS-2

Licensing Action #: 04

Licensing Action: Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

Basis Date: November 1986 (NUREG-1057, Supplement 3)

To Be Transitioned?: Yes

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.a (4), states:

The Standard Review Plan states that penetration openings for ventilation systems should be protected by fire dampers having a rating equivalent to that required of the barrier (see NFPA-90A, 'Air Conditioning and Ventilating Systems').

Difference from the SRP:

Fire dampers installed in barrier openings consist of two 1 1/2-hour fire-rated dampers in series instead of one 3-hour fire-rated damper. This is not a tested configuration.

Justification:

The two 1 1/2-hour fire dampers in series is equivalent to a 3-hour rated damper and adequately assures that the fire barriers will be maintained for the specific fire areas. These dampers were all purchased as U.L.-rated dampers and placed in series in common sleeves to provide the equivalent 3-hour rated damper. In most cases, the U.L. label was removed due to the two dampers being in series, a configuration in which the dampers were not U.L. tested. When additional dampers were required, they were purchased under the same specifications and purchase order as the original dampers.

In the remaining few cases, the U.L. label was removed because of the addition of the CO2 release device. This is because the dampers were not tested with the release device installed. However, the CO2 release device is a plunger operated pin in addition to the fusible link pin in the damper. The CO2 release device is listed for this application with U.L. and therefore does not reduce the effectiveness of the damper.

Combustible loadings were calculated for all fire areas within the plant. There are two fire areas that have fire loadings in excess of 1 1/2-hours that have ventilation penetrations. These areas are listed below and have fire loadings of less than 3 hours and all areas have an automatic fire suppression system.

1. Cable Tunnel (CT-1)

2. Cable Vault and Rod Control Areas (CV-1)

The fire loadings in these areas are due in a large part to cables. All cables, except certain cables located in conduit, are IEEE-383-1974 for safety related applications or similarly rated for non-safety applications (Refer to Section 8.3.3 for further details), and thus will not support combustion even though they are included in the fire loadings calculations.

BVPS-2

Licensing Action #: 04

Licensing Action: Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

SSD RAI 13(c)

Evaluation:

NRC SSER - NUREG-1057, Supplement 3, Section 9.5.1.4, "General Plant Guidelines," states:

> *In the SER, the staff stated that 3-hour fire-rated damper assemblies are provided in all ventilation ducts that penetrate 3-hour fire-rated barriers and that the damper assemblies are Underwriters Laboratories, Inc. (UL) labeled. By letter dated March 27, 1985, the applicant informed the staff that the 1 1/2-hour-rated fire damper assemblies are installed in series in each duct penetrating a 3-hour fire-rated barrier. Moreover, because the applicant redefined the fire area boundaries, some damper assemblies had to be installed within completed heating, ventilation, and air conditioning (HAVC) systems. These damper assemblies are located close to, but not within, the fire barrier penetration. To compensate for the damper location, the applicant enclosed the ductwork from the fire barrier to the damper assembly with 3-hour fire-rated barrier material.*
>
> *In the March 27, 1985, letter, the applicant also informed the staff that although all of the fire damper assemblies were purchased as UL-labeled units, the manufacturer had removed the UL label from the assemblies because they were not tested in the series configuration, and because they were not tested with carbon dioxide fire-suppression-system-actuated release devices.*
>
> *For a fire to spread between fire areas through an HVAC system duct, it would have to burn through the duct in one fire area, through two 1 1/2-hour fire-rated dampers, and finally, through the duct in the adjoining area. In the staff's opinion, the two 1 1/2-hour fire-rated dampers will provide the equivalent fire resistance of one 3-hour fire-rated damper. The 3-hour fire-rated wrap around the ducts constitutes continuous fire-rated construction which will prevent fire spread through the ductwork between the fire barrier and the fire dampers. The release device is a plunger-operated pin that is in addition to the fusible link for damper actuation. The device is UL-listed for this service and, in the staff's opinion, will not reduce the effectiveness of the dampers actuated by the devices. The staff concludes that the fire dampers, as installed, will prevent fire spread from one fire area to another. The damper installation is, therefore, an acceptable deviation from Section C.5.a(4) of BTP CMEB 9.5-1.*

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The deviation for ventilation system fire damper installations is being transitioned to the new licensing basis per NFPA 805.

BVPS-2

Licensing Action #: 04

Licensing Action: Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

Disposition:

Licensing Action acceptable for transition

References:

- 10080-B-085, Revision 14, "Fire Hazard Analysis."
- 10080-DEC-3560, Revision 1, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning."
- 10080-RB-0003A, Revision 12, "Fire Protection Arrangement."
- 10080-RB-0003B, Revision 10, "Fire Protection Arrangement 718' to 735'."
- NUREG-1057, Supplement 3, "NRC SSER - NUREG-1057, Supplement 3 dated November 1986."
- TER-13568, Revision 0, "IEEE-383-74 Cable Flame Test Comparative Analysis."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

~~Ch.4 - Compartment: 2-ASP~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-CB-1~~
Ch.4 - Compartment: 2-CB-4
~~Ch.4 - Compartment: 2-CB-5~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-CB-6~~
~~Ch.4 - Compartment: 2-CP-1~~
~~Ch.4 - Compartment: 2-CV-1~~
~~Ch.4 - Compartment: 2-CV-2~~
~~Ch.4 - Compartment: 2-CV-3~~
~~Ch.4 - Compartment: 2-CV-4~~
~~Ch.4 - Compartment: 2-CV-5~~
~~Ch.4 - Compartment: 2-CV-6~~
Ch.4 - Compartment: 2-DG-2
~~Ch.4 - Compartment: 2-FB-1~~ SSD RAI 13(c)
Ch.4 - Compartment: 2-PA-3
Ch.4 - Compartment: 2-PA-4
Ch.4 - Compartment: 2-PA-5
Ch.4 - Compartment: 2-PT-1
~~Ch.4 - Compartment: 2-SB-1~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-SB-2~~
Ch.4 - Compartment: 2-SB-3
Ch.4 - Compartment: 2-SB-4
Ch.4 - Compartment: 2-SB-5
~~Ch.4 - Compartment: 2-SB-6~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-SB-7~~

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Licensing Action #: 04

Licensing Action: Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

~~Ch.4 - Compartment: 2-SB-8~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-SB-9~~
Ch.4 - Compartment: 2-SB-10
~~Ch.4 - Compartment: 2-SG-1N~~ SSD RAI 13(c)
Ch.4 - Compartment: 2-SG-1S
~~Ch.4 - Compartment: 2-WH-1~~ SSD RAI 13(c)
Ch.4 - Compartment: 3-CR-1
~~Fire Protection - Fire Compartment: 2-CB-1 / Form: Gaseous Suppression~~ SSD RAI 13(c)
~~Fire Protection - Fire Compartment: 2-CB-1 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-CB-4 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-CB-5 / Form: Passive Protection~~ SSD RAI 13(c)
~~Fire Protection - Fire Compartment: 2-CB-6 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CB-6 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CP-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-1 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CV-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-2 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CV-2 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-3 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CV-3 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-4 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-5 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-6 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CV-6 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-FB-1 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-MS-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-5 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PT-1 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-SB-1 / Form: Passive Protection~~ SSD RAI 13(c)
~~Fire Protection - Fire Compartment: 2-SB-2 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-SB-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-5 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-SB-6 / Form: Detection~~ SSD RAI 13(c)
~~Fire Protection - Fire Compartment: 2-SB-6 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-7 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-8 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-SB-8 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-9 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-SB-10 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-SG-1N / Form: Passive Protection~~ SSD RAI 13(c)
Fire Protection - Fire Compartment: 2-SG-1S / Form: Passive Protection

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Licensing Action #: 04

Licensing Action: Ventilation Penetration Openings (Fire Dampers) - Lack of Appropriate Fire Dampers - BTP C.5.a(4)

~~Fire Protection - Fire Compartment: 2-WH-1 / Form: Passive Protection~~ SSD RAI 13(c)

Fire Protection - Fire Compartment: 3-CR-1 / Form: Passive Protection

BVPS-2

Licensing Action #: 05

Licensing Action: Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork 1-Hour Fire Wrap - BTP C.5.a(4)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: Yes

Basis:

The BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), states:

The Standard Review Plan states that penetration openings for ventilation systems should be protected by fire dampers having a rating equivalent to that required of the barrier (see NFPA-90A, 'Air Conditioning and Ventilating Systems'). Flexible air duct coupling in ventilation and filter systems should be noncombustible.

Differences from the SRP:

a. Certain fire dampers were located outside of fire barriers and the ductwork portions from the dampers to the barriers are protected with a 1-hour fire-rated material.

b. In the HVAC duct penetrating the fire barrier between Fire Areas SB-3 and SB-4 (ceiling of SB-3/floor of SB-4), the upper damper of a 3-hr equivalent pair extends 2 inches above the fire barrier. In this particular instance, the 2 inch portion of ductwork will not be wrapped with a fire wrap material.

The portion of the ductwork penetrations located between PA-3 and PA-4 (Degassifier and Gas Waste Charcoal Bed Cubicles) will not be wrapped with a fire wrap material.

c. Ventilation ductwork passing through fire barriers is protected on both sides of the barrier with a 1-hour fire-rated material and automatic detection instead of fire dampers installed at the barrier.

d. Ventilation ductwork passing through fire barriers is protected on the outsides of the barrier with a 1-hour fire-rated material and automatic detection and suppression instead of fire dampers.

e. Gland steam exhaust ventilation ductwork between SB-5 and PA-5 has non-rated dampers.

Justification:

a. Due to changes in boundaries of a portion of the plant's fire areas it became necessary to install fire dampers in completed ventilation systems. Extensive redesign and field modifications would have been required to locate the fire dampers inside the barrier.

The fire dampers are located as close to the fire barriers as possible and the ductwork from the fire dampers to the barrier is wrapped with a 1-hour fire-rated material. Fire wrap is also installed on the ductwork beyond the fire damper to the first support if required to ensure the ductwork's integrity.

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Licensing Action #: 05

Licensing Action: Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork 1-Hour Fire Wrap - BTP C.5.a(4)

The fire severity in these areas is less than 1 hour on both sides of the barrier or automatic suppression and detection has been provided.

The fire dampers are used as fire barriers between:

	Opposite Side	*Located in*
1)	*PA-3 (less than 1 hr)*	*and PA-5 (less than 1 hr)*
2)	*PA-4 (less than 1 hr)*	*and PA-3 (less than 1 hr)*
3)	*SB-3 (less than 2 hr with suppression*	*and SB-4 (less than 1 hr)*
4)	*SB-4 (less than 1 hr)*	*and SB-5 (less than 1 hr)*
5)	*PT-1 (less than 1 hr)*	*and SG-1S (less than 1 hr)*
6)	*PA-5 (less than 1 hr)*	*and WH-2 (less than 1 hr)*

b. Due to field interferences, fire wrap material cannot be placed on all sides of this 2-inch portion of the ductwork. Combustible loadings (within SB-3 and SB-4 < 1 hour) are less than the rating of the lower damper which is located in the barrier. Additionally, these areas are provided with automatic detection with local and control room alarms.*

For fire areas PA-3 and PA-4 Degassifier and Gas Waste Charcoal Bed Cubicles), an evaluation (10080-DMC-0699) has been performed in accordance with Generic Letter 86-10 to justify the acceptability of the ductwork.

**Allowable combustible loadings in SB-3 are increased as result of Design Analysis 10080-DEC-196*

c. Due to plant layout the ventilation ductwork for the battery room exhaust system was required to pass through other fire areas (SB-1, SB-2, SB-4) not serviced by this system. In order to ensure the system availability in the event of a fire in an area not using this system, the ductwork was protected with a 1-hour fire-rated material and fire dampers were not installed in the fire barriers. The fire severity in these areas (SB-1, SB-2, SB-4) is less than 1 hour and automatic general area fire detection with local and control room alarms has been provided.

d. Due to plant layout the ventilation ductwork for the emergency switchgear ventilation and the battery room exhaust system were required to be installed in other fire areas (CV-1, CV-3, SB-3) not serviced by this equipment. In order to ensure the system availability in the event of a fire in an area not using these systems, the ductwork was protected with a 1-hour fire-rated material and fire dampers were not installed in the fire barriers. These fire areas (CV-1, CV-2, and CV-3) are provided with automatic suppression and detection with local and control room alarms.

e. A Generic Letter 86-10 evaluation determined that the Gland Steam System ductwork will prevent the spread of fire between PA-5 and SB-5 without crediting 2GSS-DMPF23A and B as fire dampers.

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Licensing Action #: 05

Licensing Action: Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork 1-Hour Fire Wrap - BTP C.5.a(4)

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

SSD RAI 13(c)

Evaluation:

NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

In SSER 3, the staff stated that some fire damper assemblies were located outside of the fire barrier because of a redefining of certain fire areas and that where this took place, the ductwork from the barrier to the fire damper assembly would be wrapped with 3-hour fire-rated material. Section C.5.a(4) of BTP CMEB 9.5-1 states that, 'penetration openings for ventilation systems should be protected by fire dampers having a rating equivalent to that required of the barrier.' In a meeting on November 5, 1986, the applicant stated that 3-hour wrap material could not be used because of weight limitations of the structural supports and stated that the ductwork would be wrapped with 1-hour rated material. This deviation was included in Amendment 14 to the FSAR following the meeting. Fire dampers requiring 1-hour wrap are used as fire barriers between Fire Areas PA-3 and PA-5, PA-4 and PA-5, SB-3 and SB-4, SB-4 and SB-5, and PT-1 and SG-1S. The fire loading is less than ½ hour on either side of the subject dampers. Smoke detection is provided in all areas where the 1-hour wrap will be installed and hose racks are provided for fire brigade use. It is expected that a fire would be detected in its incipient stage and the plant fire brigade would extinguish it using the installed hose racks. Providing additional structural support to the ductwork to accommodate 3-hour wrap would not significantly increase the level of fire safety. Therefore, wrapping ductwork from the barrier to the damper with 1-hour material is an acceptable deviation to Section C.5.a(4) of BTP CMEB 9.5-1.

The applicant also identified one damper in Fire Area SB-4 in which a 2-inch portion of the ductwork could not be wrapped because of interferences and therefore constituted an additional deviation from Section C.5.a(4) of BTP CMEB 9.5-1. The fire loading in this area is less than 1/2 hour and detection is provided. The 2-inch portion of the ductwork is above one of the 1-1/2 hour dampers that are in series. Lack of wrap on this 2-inch ductwork section does not adversely affect plant fire safety and therefore, is an acceptable deviation from Section C.5.a(4) of BTP CMEB 9.5-1.

The applicant stated in Amendment 14 to the FSAR that ventilation ductwork for the battery room exhaust system and the emergency switchgear ventilation system pass through areas not serviced by the two systems. To ensure the operability of these systems in the event of a fire in an area not using these systems, the ductwork was wrapped with 1-hour material in areas not serviced by the ventilation systems. Battery room exhaust ducts run through Fire Areas SB-1, SB-2, and SB-4. Each of these areas has a fire loading of less than 1 hour and detection is provided. In the event of a fire in these areas, it is expected that the fire would be detected in its

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Licensing Action #: 05

Licensing Action: Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork 1-Hour Fire Wrap - BTP C.5.a(4)

incipient stage and that the plant fire brigade would respond and extinguish the fire. Both the battery room exhaust ductwork and the emergency switchgear ventilation ductwork run through Fire Areas CV-1, CV-3, and SB-3. These fire areas have a combustible loading of less than 2 hours and are provided with detection and automatic suppression. It would be expected that a fire in these areas would be detected in its incipient stage and that the plant fire brigade would respond and control it. The automatic suppression provides added assurance that a fire would not jeopardize the integrity of the 1-hour wrapped ventilation ducts. On the basis of this evaluation, this method of ensuring continuous ventilation to the battery room and emergency switchgear is acceptable.

Validation/Conclusions:

In conclusion, the bases for previous acceptance are still valid as described in the applicable sections above. The deviation for fire damper assemblies, fire wrap protection of ventilation ductwork, and the method of ensuring continuous ventilation to the battery room and emergency switchgear is being transitioned to the new licensing basis under NFPA 805.

The specific technical justifications for ventilation duct deviations have not previously been well documented. It has been determined to conservatively associate and apply the technical justification of this licensing action to all ventilation ductwork within BVPS-2 which is either fire-wrapped or which contains two 1.5-hour rated fire dampers in series ~~therefore, this licensing action is clarified in Attachment T~~. If the combustible loading within the compartment is greater than one hour, the smoke detection and fire suppression systems within the compartment are generally credited as additional measures to minimize the likelihood of fire propagation through the ductwork, consistent with the SER for the existing licensing action. If the combustible loading within the compartment is less than one hour, smoke detection is not required, based on the robustness of steel ductwork ~~as noted in the clarification~~. The combustible loading for 2-SB-4 has increased to over 0.5 hour but is less than 1 hour. This combustible loading increase has been determined to be acceptable and the basis for previous acceptance remains valid.

SSD RAI 13(c)

SSD RAI 13(c) and LIC (7)

Disposition:

Licensing Action acceptable for transition

References:

- 10080-B-085, Revision 15, "Fire Hazard Analysis." LIC (7)
- 10080-DEC-0196, Revision 1, "Non Rated Fire Assembly-Ductwork Unit 2 SB-3 2HVZ-DMPF-205A/B & 206A/B."
- 10080-DMC-0699, Revision 0, "Non-Rated Fire Assembly Ductwork, Unit 2 Degass & Waste Gas Charcoal Bed."
- 10080-RB-0016B, Sheet 2, Revision 11, "Ventilation & Air Conditioning Reactor Containment Contiguous Areas."

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Licensing Action #: 05

Licensing Action: Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork 1-Hour Fire Wrap - BTP C.5.a(4)

- 10080-RB-0016C, Sheet 3, Revision 10, "Ventilation & Air Conditioning Reactor Containment Contiguous Areas."
- 10080-RB-0016K, Sheet 10, Revision 14, "Ventilation & Air Conditioning Reactor Containment Contiguous Area."
- 10080-RB-0035A, Sheet 1, Revision 10, "Ventilation Service Building."
- 10080-RB-0035B, Sheet 2, Revision 11, "Ventilation Service Building."
- 10080-RB-0035C, Sheet 3, Revision 10, "Ventilation Service Building."
- 10080-TLD-033A-014-03, Revision 5, "Test Loop Diagram CO2 System 2 Zone 2 Detection."
- 10080-TLD-033A-020-03, Revision 5, "Test Loop Diagram CO2 System 2 Zone 3 Detection."
- 10080-TLD-033A-023-03, Revision 5, "Test Loop Diagram CO2 System 2 Zone 4 Detection."
- 10080-TLD-033D-001-03, Revision 6, "Fire Detection Zone 1 Service Building Smoke Detection."
- 10080-TLD-033D-002-02, Revision 4, "Fire Detection Zone 2 Service Building Smoke Detection."
- 10080-TLD-033D-004-03, Revision 5, "Fire Detection Zone 4 Service Building Smoke Detection."
- 10080-TLD-033D-005-03, Revision 6, "Fire Detection Zone 5 Service Building Smoke Detection."
- 10080-TLD-033D-030-05, Revision 6, "Fire Detection Zone 30 Cable Vault Smoke Detection."
- 10080-TLD-033D-032-02, Revision 4, "Fire Detection Zone 32 Cable Vault Smoke Detection."
- 2OST-33.35, Revision 2, "Fire Rated Assemblies Visual Inspection."
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- FPPCE 06-043, Revision 1, "Evaluation of Maintaining Fire Rating of Fire Dampers 2GSS-DMPF23A & B."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

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Licensing Action #: 05

Licensing Action: Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork 1-Hour Fire Wrap - BTP C.5.a(4)

Associations:

~~Ch.4 - Compartment: 2-ASP~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-CB-1~~
~~Ch.4 - Compartment: 2-CB-5~~
~~Ch.4 - Compartment: 2-CB-6~~
~~Ch.4 - Compartment: 2-CP-1~~
~~Ch.4 - Compartment: 2-CV-1~~
~~Ch.4 - Compartment: 2-CV-2~~
~~Ch.4 - Compartment: 2-CV-3~~
~~Ch.4 - Compartment: 2-CV-4~~
~~Ch.4 - Compartment: 2-CV-5~~
~~Ch.4 - Compartment: 2-CV-6~~
~~Ch.4 - Compartment: 2-FB-1~~
Ch.4 - Compartment: 2-PA-3
Ch.4 - Compartment: 2-PA-4
Ch.4 - Compartment: 2-PA-5
Ch.4 - Compartment: 2-PT-1
~~Ch.4 - Compartment: 2-SB-1~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-SB-2~~
Ch.4 - Compartment: 2-SB-3
Ch.4 - Compartment: 2-SB-4
Ch.4 - Compartment: 2-SB-5
~~Ch.4 - Compartment: 2-SB-6~~ SSD RAI 13(c)
~~Ch.4 - Compartment: 2-SB-7~~
~~Ch.4 - Compartment: 2-SB-8~~
~~Ch.4 - Compartment: 2-SB-9~~
~~Ch.4 - Compartment: 2-SG-1N~~
~~Ch.4 - Compartment: 2-WH-1~~
~~Fire Protection - Fire Compartment: 2-ASP / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-ASP / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CB-1 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-CB-1 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CB-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CB-5 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CB-6 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-CB-6 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CP-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-1 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-CV-1 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CV-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-2 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-CV-2 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-3 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-CV-3 / Form: Gaseous Suppression~~

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Licensing Action #: 05

Licensing Action: Fire Dampers and Ventilation Ductwork - Assembly Location and Deviation in Ductwork 1-Hour Fire Wrap - BTP C.5.a(4)

~~Fire Protection - Fire Compartment: 2-CV-3 / Form: Passive Protection~~ SSD RAI 13(c)
~~Fire Protection - Fire Compartment: 2-CV-4 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-5 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-CV-6 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-CV-6 / Form: Gaseous Suppression~~
~~Fire Protection - Fire Compartment: 2-CV-6 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-FB-1 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-PA-3 / Form: Detection
Fire Protection - Fire Compartment: 2-PA-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-4 / Form: Detection
Fire Protection - Fire Compartment: 2-PA-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-5 / Form: Detection
Fire Protection - Fire Compartment: 2-PA-5 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PT-1 / Form: Detection
Fire Protection - Fire Compartment: 2-PT-1 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-SB-1 / Form: Detection~~ SSD RAI 13(c)
~~Fire Protection - Fire Compartment: 2-SB-1 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-2 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-SB-2 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-SB-3 / Form: Detection
Fire Protection - Fire Compartment: 2-SB-3 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-SB-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-4 / Form: Detection
Fire Protection - Fire Compartment: 2-SB-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-5 / Form: Detection
Fire Protection - Fire Compartment: 2-SB-5 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-SB-6 / Form: Detection~~ SSD RAI 13(c)
~~Fire Protection - Fire Compartment: 2-SB-6 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-7 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-SB-7 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-8 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-SB-8 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SB-9 / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-SB-9 / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SG-1N / Form: Detection~~
~~Fire Protection - Fire Compartment: 2-SG-1N / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-SG-1S / Form: Detection
Fire Protection - Fire Compartment: 2-SG-1S / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-WH-1 / Form: Passive Protection~~ SSD RAI 13(c)

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Licensing Action #: 06

Licensing Action: Fire Doors - Modification of Fire Door Assemblies - BTP C.5.a(5)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: Yes

Basis:

According to BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.a(5):

The Standard Review Plan states that door openings in fire barriers should be protected with equivalently rated doors, frames, and hardware that have been tested and approved by a nationally recognized laboratory. Such doors should be self-closing or provided with closing mechanisms and should be inspected semiannually to verify that automatic hold-open, release, and closing mechanisms and latches are operable. (See NFPA 80, 'Fire Doors and Windows.')

Areas protected by automatic total flooding gas suppression systems should have electrically supervised self-closing fire doors or fire doors should be kept closed and electrically supervised at a continuously manned location.

Differences from the SRP:

a. Fire door assemblies have been modified from their tested configuration by the addition of security hardware and alarm equipment as required by NRC regulation.

b. Rolling steel fire doors in the safeguards building have had the lower jam modified from the tested configuration to allow for the installation and removal of equipment.

c. Special purpose-type door assemblies (containment access doors/hatches) are not UL rated.

d. Hollow metal swing type fire door assemblies differ from their original UL tested configuration by having door clearances larger than those identified in ASTM E-152 and NFPA-80.

e. For areas protected by automatic total flooding gas suppression systems, certain doors are not equipped with electrical supervision but are locked closed or self-closing and maintained closed.

Justifications:

a. These modifications were made following the guidelines suggested by Underwriters Laboratories. They are similar to those made on BVPS-1 which were reviewed and found acceptable by the NRC. The door areas have either automatic detection and suppression or manual fire fighting equipment available in the areas. The security alarmed doors also have remote monitoring capability via the security system video monitors and the alarm function in the event the door is left open, which would alert personnel of an abnormal condition in these areas.

The adequacy of fire door assemblies in fire barriers separating safety-related areas will be justified by one of the following:

1. The door assembly will bear a UL label denoting the required fire rating,

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2. The door assembly will have certification from the Vendor identifying the fire rating, or

3. The door assembly will be justified by an engineering analysis.

Table 9.5A-2 provides the list of fire doors with security modifications including the fire severities and methods of fire suppression for the areas separated by these doors.

b. The rolling steel doors in the north and south safeguards areas are not used to separate adjacent fire areas but are used to separate the stairwell within a fire area from the remainder of the area. Since the safeguards areas are normally unoccupied and the fire severity is less than 1/2 hour, this arrangement is acceptable.

c. These containment area special purpose-type door assemblies are capable of providing adequate fire protection for the area. The doors provide a pressure boundary and no UL fire-rated doors for these purposes are available.

d. The fire door assemblies will be justified by engineering analysis (Calc. No. 10080-DMC-3443).

e. Areas protected by automatic total flooding gas suppression systems are located in buildings that are provided with restricted access by electrically supervised security access locks which place the areas of concern out of normal travel routes. These doors are maintained closed, self-closing, administratively controlled by procedure, and checked on a daily basis. This ensures the operability of the doors and verifies that they are in the closed position. All fire doors to areas protected by automatic total flooding gas suppression systems are in accordance with the guidelines of the applicable NFPA codes for gaseous suppression systems (NFPA 12 or 12A). Doors subject to this exception are listed below:

FIRE DOOR	AREA ACCESSED	STATUS
CS-25-1	Cable Spreading to North Stair (Control Building 725')	Locked closed
CS-25-2	Cable Spreading to South Stair (Control Building 725')	Locked closed
CS-25-3	Cable Spreading to Equipment Shaft (Control Building 725')	Locked closed
DG-59-1	EDG 2-1 Room to Silencer Room (DG Building 759')	Locked closed
DG-59-2	EDG 2-1 Room to Plenum (DG Building 759')	Locked closed
DG-59-3	EDG 2-2 Room to Silencer Room (DG Building 759')	Locked closed
DG-59-4	EDG 2-2 Room to Plenum (DG Building 759')	Locked closed
DG-59-5	EDG 2-1 Room to EDG2-2 Room (DG Building 759')	*Note 1
IR-07-1	Process Equip Area to South Stair (Control Building 707')	*Note 1
IR-07-2	Process Equip Area to Equip Shaft (Control Building 707')	Locked closed

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FIRE DOOR	AREA ACCESSED	STATUS
IR-12-1	Cable Tunnel to South Stair (Control Building 712')	*Note 1
CR-07-1	Cable Tunnel to North Stair (Control Building 707')	*Note 1
CR-07-3	East Communication Room to West Communication Room (Control Building 707')	*Note 1
CR-07-4	Process Equip Area to West Communication Room (Control Building 707')	*Note 1
CV-35-4	West Cable Vault to Wests Stair (CV Building 735')	*Note 1
CV-55-1	Rod Control Area to West Cable Vault (CV Building 755')	*Note 1
M-35-1	East Cable Vault to West Cable Vault (CV Building 735')	*Note 1
M-35-2	East Cable Vault to West Stair (CV Building 735')	*Note 1
M-35-4	East Cable Vault to Main Steam Pipe Chase (CV Building 735')	*Note 1
M-55-1	Rod Control Area to East Stair (CV Building 755')	*Note 1
M-55-2	Rod Control Area to Main Steam Pipe Chase (CV Building 755')	*Note 1
A-55-4	Rod Control Area to Relay Room (PAB Building 755')	Locked closed
A-55-5	Rod Control Area to Relay Room (PAB Building 755')	Locked closed
A-55-6	Rod Control Area to Relay Room (PAB Building 755')	Locked closed
A-55-9	Rod Control Area to Alt. Shutdown Panel Room (CV Building 755')	*Note 1
A-73-4	Primary Auxiliary Building to Control Building Ventilation Room (PAB 733')	Locked closed
S-35-70	Control Room to Computer Room (Control Building 735')	*Note 1

[*Note 1 - Self-closing & maintained closed]

The areas serviced by the automatic fire suppression systems are also protected by an early-warning smoke detection system which alarms in the control room. This system would provide early indication to the operations staff of a fire event in these areas. The gas suppression total-flooding systems servicing these areas are also designed to provide a "double-shot" full discharge capability, such that the initial discharge would be automatic and the follow-up discharge would be manually activated, if necessary. Manual hose stations for backup water suppression capability is also available for the subject areas providing additional defense-in-depth fire protection capability.

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LIC (8)

The BVPS-2 UFSAR, Revision 22, contains the following Table 9.5A-2 which lists the current fire doors with security modifications.

Table 9.5A-2
Fire Doors With Security Modifications

Door No.	Areas Separated	Fire Severity (hours)	Type of Fire Suppression	
			Primary	Backup
A-10-1	PA-3	<1/2	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-12-1	CT-1	<3	Total Flood CO2	Portable ext. Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-18-2	PA-3	<1/2	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-30-1	Hallway	<1/2	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-35-2	CV-1	<2	Total Flood CO2	Portable ext. Hose rack
	Hallway	<1/2	Portable ext.	Hose rack
A-35-6	WH-1	<1/2	Portable ext. Automatic sprinkler (Radwaste Area)	Hose rack
	PA-3	<1/2	Portable ext.	Hose rack
A-35-7	PA-3	<1/2	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-45-1	SB-3	<1	Total Flood CO2	Portable ext. Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-55-1	CV-3	<2	Total Flood CO2	Portable ext. Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-55-3	PA-4	<1/2	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-60-1	SB-4	<1	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
A-73-3	PA-5	<1/2	Hose rack	Portable ext.
	Stairwell	<1/2	Portable ext.	Hose rack

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LIC (8)

Table 9.5A-2
Fire Doors With Security Modifications

Door No.	Areas Separated	Fire Severity (hours)	Type of Fire Suppression	
			Primary	Backup
A-74-1	PA-5 WH-2	<1/2 <1/2	Hose rack Automatic Sprinkler	Portable ext. Portable ext. Hose rack
SB-30-1	SB-1 Stairwell	<1 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
SB-30-2	SB-1 SB-6	<1 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
SB-30-3	SB-1 SB-7	<1 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
SB-30-4	SB-2 SB-8	<1 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
SB-30-5	SB-2 SB-9	<1 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
SB-30-6	SB-2 Stairwell	<1 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
SB-45-1	SB-3 Stairwell	<1 <1/2	Total Flood CO2	Portable ext. Hose rack Hose rack
SB-45-2	SB-3 Pipe Chase	<1 <1/2	Total Flood CO2 Portable ext.	Portable ext. Hose rack Hose rack
SB-45-3	SB-3 Stairwell	<1 <1/2	Total Flood CO2 Portable ext.	Portable ext. Hose rack Hose rack
SB-60-2	SB-4 Stairwell	<1 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
SB-80-1	SB-5 PA-5	<1/2 <1/2	Hose rack Hose rack	Portable ext. Portable ext.
F-35-1	FB-1 Outside	<1/2 <1/2	Portable ext. Portable ext.	Hose rack Hose rack
F-67-1	FB-1 PA-5	<1/2 <1/2	Portable ext. Hose rack	Hose rack Portable ext.

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LIC (8)

Table 9.5A-2
Fire Doors With Security Modifications

Door No.	Areas Separated	Fire Severity (hours)	Type of Fire Suppression	
			Primary	Backup
CV-35-1	CV-1	<2	Total Flood CO2	Portable ext. Hose rack
	Hallway	<1/2	Portable ext.	Hose rack
CV-35-2	Stairwell	<1/2	Portable ext.	Hose rack
	Hallway	<1/2	Portable ext.	Hose rack
CV-35-3	CV-1	<2	Total Flood CO2	Portable ext. Hose rack
	SB-1	<1	Portable ext.	Hose rack
CV-67-1	PA-5	<1/2	Hose rack	Portable ext.
	CV-5	--	Portable ext.	Hose rack
CV-80-1	SB-5	<1/2	Hose rack	Portable ext.
	Stairwell	<1/2	Portable ext.	Hose rack
DG-32-2	DG-2	<3	Total Flood CO2	Portable ext. Hose rack
	Outside	<1/2	Portable ext.	Hose rack
DG-32-3	DG-1	<3	Total Flood CO2	Portable ext. Hose rack
	Outside	<1/2	Portable ext.	Hose rack
DG-32-4	DG-1	<3	Total Flood CO2	Portable ext. Hose rack
	Outside	<1/2	Portable ext.	Hose rack
W-22-1	WH-1	<1/2	Portable ext. Automatic Sprinkler (Radwaste Area)	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
W-35-1	WH-1	<1/2	Portable ext. Automatic Sprinkler (Radwaste Area)	Hose rack
	CP-1	<3	Portable ext.	Hose rack
W-35-2	WH-1	<1/2	Portable ext. Automatic Sprinkler (Radwaste Area)	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack

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LIC (8)

Table 9.5A-2
Fire Doors With Security Modifications

Door No.	Areas Separated	Fire Severity (hours)	Type of Fire Suppression	
			Primary	Backup
W-44-1	WH-1	<1/2	Portable ext. Automatic Sprinkler (Radwaste Area)	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
S-35-68	CB-3	<1/2	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
C-35-4	CP-1	<3	Portable ext.	Hose rack
	Stairwell	<1/2	Portable ext.	Hose rack
C-74-7	CP-1	<3	Portable ext.	Hose rack
	CP-1D (Primary Chem. Lab)	<3	Automatic Sprinkler	Portable ext.
GW-35-1	Gaseous Waste Storage Vault	<1/2	Portable ext.	
	Stairwell	<1/2	Portable ext.	

Evaluation:

NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

In the SER, the staff stated that with the exception of two rolling fire doors, door openings are in compliance with Section C.5.a(5) of BTP CMEB 9.5-1, which states that 'door openings in fire barriers should be protected with equivalently rated doors, frames, and hardware that have been tested and approved by a nationally recognized laboratory.' The applicant stated in Amendment 14 to the FSAR that certain doors have been modified by the installation of security hardware and are no longer approved fire doors. The applicant also stated that there are 'special purpose' doors that are not approved by Underwriters Laboratories (UL). During the site audit of January 27-30, 1987, the applicant identified 40 doors that were modified for security purposes. The applicant demonstrated that all modifications were made in accordance with recommendations supplied by UL. Although the applicant stated that all doors were originally purchased as UL-approved, it was noticed during the site visit that some UL labels were missing from doors. The applicant committed to have the doors relabeled by the manufacturer or to maintain on file documentation that individual doors are UL approved. This commitment will be implemented by fuel load. It was also observed that the security modifications consisted primarily of the addition of electric contact switches with a single conduit penetrating the frame. Installations appeared to be in accordance with design drawings, which were based on UL recommendations. Therefore, with the exception of the doors missing labels,

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the security-modified fire doors are an acceptable deviation from Section C.5.a(5) of BTP CMEB 9.5-1.

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The combustible loading for 2-SB-4 has increased to over 0.5 hour but is less than 1 hour. This combustible loading increase has been determined to be acceptable and the basis for previous acceptance remains valid. The deviation for modified fire doors, special purpose doors, and certain doors that are not equipped with electrical supervision for areas protected by automatic total flooding gas suppression systems, is being transitioned to the new licensing basis per NFPA 805. LIC (7)

Disposition:

Licensing Action acceptable for transition

References:

- 1/2-ADM-1900, Revision 27, "Fire Protection Program."
- 1/2-ADM-1905, Revision 2, "Fire Protection/Fire Barrier Impairments."
- 1/2-PMP-33FP-FIRE DOORS-1M, Revision 8, "Periodic Inspection of Fire Doors."
- 10080-B-085, Revision 14, "Fire Hazard Analysis."
- 10080-DMC-3443, Revision 0, Addendum 1, "86-10 Evaluation of Excess Clearances b/w FR Doors & Frames."
- 10080-RA-0001C, Sheet 1, Revision 10, "Floor Plan - Service Building."
- 10080-RA-0001D, Sheet 2, Revision 12, "Floor Plan - Service Building."
- 10080-RA-0001E, Sheet 3, Revision 9, "Floor Plan - Service Building."
- 10080-RA-0001F, Sheet 4, Revision 12, "Floor Plan - Service Building."
- 10080-RA-0006A, Sheet 1, Revision 30, "Door Schedule."
- 10080-RA-0006B, Sheet 2, Revision 20, "Door Schedule & Details."
- 10080-RA-0006D, Sheet 4, Revision 16, "Door Schedule."
- 10080-RA-0010G, Revision 5, "Stairs-Waste Handling Building."
- 10080-RA-0010K, Revision 6, "Safe Guards Building & Gaseous Waste Storage Vault Stairs & Detectors."
- 10080-RA-0020A, Revision 8, "General Roof Plan All Buildings."
- 10080-RA-0036A, Sheet 1, Revision 16, "Plans Auxiliary Building."
- 10080-RA-0036B, Sheet 2, Revision 15, "Plans Auxiliary Building."

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- 10080-RA-0036F, Revision 10, "Plan Floor 718' & 710' Auxiliary Building."
- 10080-RB-0003A, Revision 12, "Fire Protection Arrangement."
- 10080-RB-0003B, Revision 10, "Fire Protection Arrangement 718' to 735'."
- 10080-RB-0003C, Revision 6, "Fire Protection Arrangement 735' to 760'."
- 10080-RB-0003D, Revision 7, "Fire Protection Arrangement 760' to 794'."
- 10080-RB-0003E, Revision 5, "Fire Protection Arrangement 735' to 752'."
- 10080-RC-0029A, Revision 7, "Plan-El 732-6 Outline Diesel Generator Building."
- 10080-RC-0031C, Revision 10, "MN STM and CV Building 735'-6".”
- 10080-RC-0031G, Revision 11, "MS & CV Slab Plan 773'-6"."
- 10080-RC-0038A, Revision 10, "Fuel and Decontamination Building Found Plan."
- 10080-RC-0038B, Revision 10, "Fuel & Decontamination Building Plan 768'-4" & Below."
- 10080-RC-0054C, Revision 5, "Plan 735'-6" Conditioning Polishing Building."
- 10080-RC-0054G, Revision 4, "Plan 774'-6" Conditioning Polishing Building."
- 10080-RC-0733A, Revision 8, "Embedments-Penetrations-Openings 722 & 735 Waste Handling."
- 10080-RS-0011B, Sheet 2, Revision 1, "Miscellaneous Steel Framing Service Building."
- 8700-RA-0020D, Revision 4, "Stair Details Main Entrance & Control Room."
- 10800-B-085, Revision 15, "Fire Hazards Analysis." LIC (7)
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- SP-6.0, Revision 43, "Tests, Inspections and Maintenance of Security Alarm Systems."
- SP-14.0, Revision 14, "Protected Area Surveillance System."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.4 - Compartment: 2-ASP LIC (8)
Ch.4 - Compartment: 2-CB-1
Ch.4 - Compartment: 2-CB-4 LIC (8)
~~Ch.4 - Compartment: 2-CB-5~~
Ch.4 - Compartment: 2-CB-6 LIC (8)

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Ch.4 - Compartment: 2-CP-1
Ch.4 - Compartment: 2-CV-1
Ch.4 - Compartment: 2-CV-2
Ch.4 - Compartment: 2-CV-3
Ch.4 - Compartment: 2-CV-5
Ch.4 - Compartment: 2-DG-1
Ch.4 - Compartment: 2-DG-2
Ch.4 - Compartment: 2-FB-1
Ch.4 - Compartment: 2-PA-3
Ch.4 - Compartment: 2-PA-4
Ch.4 - Compartment: 2-PA-5
Ch.4 - Compartment: 2-PT-1 LIC (8)
Ch.4 - Compartment: 2-SB-1
Ch.4 - Compartment: 2-SB-2
Ch.4 - Compartment: 2-SB-3
Ch.4 - Compartment: 2-SB-4
Ch.4 - Compartment: 2-SB-5
Ch.4 - Compartment: 2-SB-6
Ch.4 - Compartment: 2-SB-7
Ch.4 - Compartment: 2-SB-8
Ch.4 - Compartment: 2-SB-9
Ch.4 - Compartment: 2-SB-10 LIC (8)
~~Ch.4 - Compartment: 2-SG-1N~~
~~Ch.4 - Compartment: 2-SG-1S~~
Ch.4 - Compartment: 2-WH-1
Ch.4 - Compartment: 3-CR-1
Fire Protection - Fire Compartment: 2-ASP / Form: Passive Protection LIC (8)
Fire Protection - Fire Compartment: 2-CB-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-CB-4 / Form: Passive Protection LIC (8)
~~Fire Protection - Fire Compartment: 2-CB-5 / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-CB-6 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-CP-1 / Form: Passive Protection LIC (8)
Fire Protection - Fire Compartment: 2-CV-1 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-CV-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-CV-2 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-CV-2 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-CV-3 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-CV-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-CV-5 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-CV-6 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-CV-6 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-DG-1 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-DG-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-DG-2 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-DG-2 / Form: Passive Protection

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Fire Protection - Fire Compartment: 2-FB-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-5 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PT-1 / Form: Passive Protection LIC (8)
Fire Protection - Fire Compartment: 2-S-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-2 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-3 / Form: Gaseous Suppression
Fire Protection - Fire Compartment: 2-SB-3 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-4 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-5 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-6 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-7 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-8 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-9 / Form: Passive Protection
Fire Protection - Fire Compartment: 2-SB-10 / Form: Passive Protection LIC (8)
~~Fire Protection - Fire Compartment: 2-SG-1N / Form: Passive Protection~~
~~Fire Protection - Fire Compartment: 2-SG-1S / Form: Passive Protection~~
Fire Protection - Fire Compartment: 2-WH-1 / Form: Passive Protection
Fire Protection - Fire Compartment: 3-CR-1 / Form: Passive Protection

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Licensing Action #: 07

Licensing Action: Outdoor Transformers - Deviation in Location and Lack of Building Wall 3-Hour Fire Resistance - BTP C.5.a(13)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.a(13) states:

The Standard Review Plan states that outdoor oil-filled transformers should be located at least 50 feet distant from buildings, or building walls within 50 feet of oil-filled transformers should be without openings and have a fire resistance rating of at least 3 hours.

Difference from the SRP:

Transformers TR-2A, TR-2C, TR-2D, and TR-MT-2 are located within 50 feet of buildings which do not have a fire-resistance rating of at least 3 hours.

Justification:

The walls within 50 feet of these transformers which do not have a 3-hour fire rating are the turbine building and south office and shops building (SOSB) walls. The turbine building has been provided with an insulated metal siding and 3-ply gypsum board design exterior wall assembly. The SOSB has been provided with 2-hour fire-rated walls in the exposed areas. The SOSB is not part of the production plant. In addition, these transformers are provided with slag-filled sumps for cooling of hot oil. Sumps are of sufficient capacity to retain the total oil inventory associated with each transformer. These transformers are also protected by heat actuated water deluge suppression systems.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

In the SER, the staff stated that the main service transformers are located more than 50 feet away from any building or are separated by 3-hour walls, and that the station service transformers are located within 50 feet of the turbine building; however, no safety-related equipment is located within the turbine building. The applicant stated in Amendment 14 to the FSAR that four transformers, TR-2A, TR-2C, TR-2D, and TR-MT-2, are located within 50 feet of buildings which do not have a fire-resistance rating of at least 3 hours. This is a deviation from Section C.5.a(13) of BTP CMEB 9.5-1. The applicant stated that all walls within 50 feet of the transformers are 2-hour rated and that all four transformers are provided with automatic deluge systems. In addition, the fire hazards analysis identifies safety-related station air compressors in the turbine building; however, they are not required for the safe shutdown of the plant. Therefore, the transformers do not pose a fire threat to plant safety, adequate separation and protection has been provided, and the configuration of the four transformers is an acceptable deviation from BTP CMEB 9.5-1.

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Licensing Action: Outdoor Transformers - Deviation in Location and Lack of Building Wall 3-Hour Fire Resistance - BTP C.5.a(13)

Validation/Conclusions:

The outdoor transformers were evaluated using the performance-based approach NFPA 805, Section 4.2.4; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

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Licensing Action #: 08

Licensing Action: Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

Basis Date: November 1986 (NUREG-1057, Supplement 3), and May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: Yes

Basis:

According to the BVPS-2 "Updated Fire Safety Analysis Report," (BVPS-2 UFSAR), in Section 9.5A.2, "Safe Shutdown Components," Item C.5.b:

The Standard Review Plan states that one of the redundant trains is to be free of fire damage so that safe shutdown can be achieved. This can be achieved by:

a) Separating redundant trains by a fire barrier having a 3-hour rating.

b) Separating redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system should be installed in the fire area.

c) Enclosing one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system should be installed in the fire area.

Differences from the SRP:

The following safe shutdown components have not been provided with adequate separation as noted above:

DESCRIPTION	MARK NUMBER	FIRE AREA
(1) Charging Pumps	2CHS*P21A,B,C	PA-3
(2) Component Cooling Water Pumps	2CCP*P21A,B,C	PA-3
(3) Boric Acid Transfer Pumps and Storage Areas	2CHS*P22A,B & TK21A,B	PA-4
(4) Charging System Control Valves	2CHS*LCV115B,D	PA-3
	2CHS*FCV113A	PA-3
	2CHS*MOV350	PA-3
(5) Emergency Switchgear Supply and Exhaust Fans	2HVZ*FN261A,B	CV-4
	2HVZ*FN262A,B	CV-4
(6) Emergency Switchgear Supply and Exhaust Dampers	2HVZ*MOD21A,B	CV-4
	2HVZ*MOD22A,B	CV-4
(7) Emergency Exhaust Fans	2HVP*FN264A,B	PA-4
(8) Auxiliary Feedwater Control Valves	2FWE*HVC100A,B,C,D,E,F	SG-1S
(9) Atmospheric Steam Dump Valves	2SVS*PCV101A,B,C	MS-1
	2SVS*HVC104	MS-1
(10) Main Steam Isolation Valves	2MSS*AOV101A,B,C	MS-1
(11) Equipment inside containment	(Various)	RC-1

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Licensing Action: Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals" for requests).~~

SSD RAI 13(b)

Evaluation:

NRC SSER - NUREG-1057, Supplement 3, Section 9.5.1.4, "Safe-Shutdown Components," states:

By letter dated March 27, 1985, the applicant requested a deviation from Section C.5.b of BTP CMEB 9.5-1 for fire area PA-3 to the extent that it requires the separation of redundant safe-shutdown components by 3-hour fire-rated barriers.

This fire area is located on auxiliary building elevation 735 feet 6 inches. The two redundant and one swing charging pumps are located in this area, one in each of three adjacent cubicles. The walls between cubicles are reinforced concrete with 3-hour fire-rated penetration seals. The west wall of each cubicle is concrete block with a small crane rail opening; the east wall of each cubicle is reinforced concrete with a labyrinth-type opening. A curb is provided across each opening and a drain is provided in each cubicle. The equivalent fire severity per cubicle is less than 1/2 hour. Existing fire protection consists of portable extinguishers, hose stations, and an area wide ionization-type smoke-detection system.

The staff was concerned that a fire originating either outside of or within one of the pump cubicles would result in loss of safe-shutdown capability. However, because the fuel load in each cubicle is low, the staff does not expect a fire of significant magnitude or duration to occur. If a fire occurs anywhere in the fire area, it would be detected by the ionization detectors and extinguished by the plant's fire brigade before spreading into or from a pump cubicle. In the staff's opinion, any fire would, at most, cause damage to one shutdown system, but would not propagate horizontally and damage the redundant pump before self-extinguishing or being extinguished by the plant's fire brigade.

On the basis of this evaluation, the staff concludes that the lack of complete 3-hour fire-rated barriers around each redundant charging pump is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.

NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "Safe Shutdown Capability," states:

The staff review of the fire protection afforded the safe shutdown capability of Beaver Valley Unit 2 included the FSAR, up to and including Amendment 16, the fire protection safe shutdown report (FPSSR) provided by transmittal dated March 24, 1987 and additional information provided by letter dated May 11, 1987. FSAR Section 9.5.1 describes the overall fire protection program and the FPSSR discusses the safe shutdown capability, including the potential for spurious operation of equipment in each fire area. FSAR Section 7.4 provides additional information on safe and alternate shutdown system controls capability.

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The applicant's safe shutdown analysis demonstrates that systems needed for hot and cold shutdown are redundant and that one of the redundant systems needed for safe shutdown would be free of fire damage because of separation, fire barriers, fire detection and suppression, or a combination of these and/or alternative shutdown capability. Alternative shutdown capability is provided for a fire in the instrumentation and relay room (CB-1), cable spreading room (CB-2), main control room (CB-3), west communication room (emergency shutdown panel station) (CB-6), and cable tunnel (CT-1) because these areas contain more than one division of safe shutdown cabling in close proximity to each other and in-place protection from fire cannot be provided.

For hot shutdown and for cooldown to cold shutdown conditions, at least one train of the following safe shutdown systems would be available: reactor coolant system (RCS), auxiliary feedwater system, main steam system (atmospheric dump valves) and chemical and volume control system (CVCS). For cold shutdown conditions, at least one train of the residual heat removal (RHR) system would be available for long-term decay heat removal. A single train provides the capability to achieve cold shutdown conditions within 72 hours with or without offsite power after a fire. The availability of these systems includes the components, cabling, electrical distribution panels, and support systems necessary to achieve cold shutdown. The support systems include the service water system; reactor plant component cooling water system; emergency diesel generator and its support systems; station service air system; filter water system; necessary heating, ventilation, and air conditioning systems; emergency ac and dc power systems; and necessary instrumentation to monitor plant parameters for safe shutdown. The above systems are used to achieve safe shutdown through various success paths, depending on the location of the fire. Reactivity control is accomplished through control rod insertion followed by boration provided by a charging pump (CVCS) drawing suction from borated water supplies from the refueling water storage tank or from the boric acid tanks through a boric acid transfer pump. RCS makeup/inventory control is provided by a charging pump combined with letdown. RCS pressure control is also accomplished by a charging pump combined with letdown, the power-operated relief valves, or the pressurizer heaters if available. RCS decay heat removal is accomplished initially using the steam generator safety relief valves and by the power-operated relief valves (atmospheric dump valves) during cooldown, and the auxiliary feedwater system, down to a temperature of 350 degree F, at which time the heat-removal function is transferred to the RHR system.

For certain fires outside the control room, cold leg temperature (T-cold) wide range indication may be lost because all T-cold indication in the control room is powered from train B. This is acceptable since alternate means for determining T-cold is available by use of steam generator pressure indication and other normal train A primary system instrumentation. Similarly for certain other fires outside the control room, the use of core exit thermocouples for T-hot indication and use of T-cold as an alternate to steam generator pressure indication are acceptable.

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Licensing Action: Safe Shutdown Components - Lack of Separation of Redundant Trains - BTP C.5.b

The applicant's fire protection safe shutdown analysis demonstrates that except for the instrument and relay room (CB-1), cable spreading room (CB-2), main control room (CB-3), west communication room (CB-6), and cable tunnel (CT-1), redundant systems and cabling needed for safe shutdown following a fire are separated in accordance with BTP CMEB 9.5-1, Positions C.5.b.1 and C.5.b.2 with some noted deviations that are evaluated elsewhere in Section 9.5.1 of the SER and its supplements. For Fire Areas CB-1, CB-2, CB-3, CB-6, and CT-1, the applicant has provided alternate shutdown capability independent of these areas in accordance with Position C.5.c of BTP CMEB 9.5-1.

NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "Safe Shutdown Components," states:

Section C.5.b of BTP CMEB 9.5-1 identifies the separation criteria for redundant safe shutdown components. The applicant had originally intended to install new barriers for areas that do not meet these guidelines. By letter dated March 27, 1985, the applicant stated that installation of these barriers would not be possible and that an alternative means of separation would be required, which would necessitate deviations from the SRP. Amendment 14 to the FSAR identified 11 areas in which deviations from the separation criteria exist. One of these areas, the charging pump room, was approved in SSER 3. The remaining deviations have been evaluated through Amendment 14 and during a site audit of January 27-30, 1987. The 10 deviations were found to be acceptable as identified in the following evaluations.

Component Cooling Water Pumps

*The component cooling water pumps (2CCP*P21A, B, and C) are located in the auxiliary building at elevation 735 feet, 6 inches. Pumps A and B are separated by 24 feet; however, the C swing pump is located between pumps A and B and is an intervening combustible. Each pump contains ½ gallon of lube oil and has combustible motor insulation. The combustible loading in the immediate area of the pumps is negligible and there is detection and automatic water suppression over each pump. There is reasonable assurance that a single fire could not jeopardize the operation of both pumps A and B. If a fire were to occur, the plant fire brigade would respond and control it. The automatic suppression would also limit the size and intensity of a fire. Therefore, the lack of at least 20 feet of separation of the component cooling pumps with no intervening combustibles is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.*

Boric Acid Transfer Pumps and Storage Tanks

Each of the boric acid pumps and tanks is located in a separate cubicle with 2-foot-thick reinforced concrete walls. The pumps and tanks do not meet the separation criteria because they are located within 20 feet of their redundant components and the cubicles are not totally enclosed. Each of the cubicles has a labyrinth-type opening for missile and radiation protection. Each cubicle will be provided with detection and the combustible loading is low. It is expected that a fire would be detected in its incipient stage and that the plant fire brigade would respond and

control it. It is not probable that a fire in any cubicle could travel through the labyrinth opening and into the adjacent cubicle of the redundant component. Therefore, the arrangement of the boric acid transfer pumps and boric acid storage tanks is an acceptable deviation from BTP CMEB 9.5-1 Section C.5.b.

Charging System Suction Valves

There are four valves that can provide suction paths for the charging pumps during shutdown. All four valves are located in the same area; however, only one valve is necessary for safe shutdown. There is approximately 15 feet of separation between the farthest valves. The combustible loading in the area is negligible. Access to the area will be strictly controlled for radiation purposes and therefore, it is unlikely that transient combustibles would accumulate. The area is provided with detection and it is expected that a fire would be detected in its incipient stage and that the plant fire brigade would respond and extinguish it. There is reasonable assurance that a fire would not prevent the operation of at least one of the four valves. Therefore, the lack of charging system suction valve separation is an acceptable deviation from BTP CMEB 9.5-1, Section C.5.b.

Emergency Switchgear Room Supply and Exhaust Fans and Emergency Switchgear Room Supply Dampers

The emergency switchgear room supply and exhaust fans and emergency switchgear room supply dampers do not meet the criteria of the SRP because the redundant components are not separated from each other by a 3-hour barrier. The two supply fans and the two exhaust fans are located in Fire Area CV-4. All of the motors are totally enclosed and are located in separate ductwork. The control cable for supply fan A and exhaust fan A has been protected with 1-hour fire-wrap material in the fire area outside of the ductwork. The combustible loading in the fire area is negligible and detection has been provided. It is anticipated that if a fire were to occur, it would be detected in the incipient stage and the plant fire brigade would respond to extinguish it, using adjacent hose racks. There is reasonable assurance that a fire would not jeopardize both trains of supply fans and exhaust fans. The supply dampers are located in a plenum adjacent to the supply fans. The combustible loading in the plenum is negligible and there is limited access by plant personnel. The damper motors are totally enclosed, which would prevent the burnout of one motor from affecting the operation of the other. There is reasonable assurance that a fire would not affect the operation of both dampers. Therefore, the lack of separation between the emergency switchgear room supply fans and exhaust fans and the emergency switchgear room supply dampers is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.

Charging Pump Emergency Exhaust Fans

The charging pump emergency exhaust fans are not in compliance with the SRP because they are not separated by a 3-hour barrier. The fans are located in Fire Area PA-4 and are in a configuration similar to the emergency switchgear supply and exhaust fans. Both fans and motors are totally contained within the ductwork. The

combustible loading near the fans is low and detection is provided. Therefore, the lack of separation between the charging pump emergency exhaust fans is an acceptable deviations from Section C.5.b of BTP CMEB 9.5-1.

Auxiliary Feedwater Control Valves

The six auxiliary feedwater control valves are all located in Fire Area SG-1S, which deviates from the separation guidelines of the SRP. However, these valves are hydroelectrically operated, normally open valves, which fail "as is" on loss of electrical control. On loss of hydraulic oil, the auxiliary feedwater flow will open the valves. The applicant stated that auxiliary feedwater flow can be controlled manually throttling the discharge valve at the auxiliary feedwater pump. The combustible loading in fire area SG-1S is less than 1/2 hour and detection is provided. It is anticipated that a fire would be detected early and the plant fire brigade would respond and control it. Even if a fire were to disable all six valves, the plant could still be able to safely shut down. Therefore, the lack of separation between redundant auxiliary feedwater control valves is an acceptable deviation from Section C.5.b. of BTP CMEB 9.5-1.

Atmospheric Steam Dump Valves and Main Steam Isolation Valves

*Atmospheric steam dump valves 2SVS*PCV 101 A, B, and C and main steam isolation valves (MSIVs) 2MSS*HYC 101 A, B, and C are located in the main steam valve house and are not separated in compliance with the SRP guidelines. The combustible loading in the valve house is less than ½ hour and the detection is provided. The steam dump valves are partially separated by concrete walls, which extend at least 2 feet beyond the valves. The MSIVs are spring-loaded valves, which are latched open during plant operation. Only one of the three solenoid-operated valves for each MSIV is required to operate to close the MSIV. Two of the solenoids are designed to de-energize and the third is designed to energize. There is reasonable assurance that a fire would not prevent the operation of the required steam dump valves or main steam isolation valves. By letter dated December 4, 1986, the staff granted an exemption for the Beaver Valley Unit 1 main steam valve room equipment separation. The configuration of the Unit 2 main steam valve room is equivalent to that of Unit 1. Therefore, the lack of separation between valves in the main steam valve room is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.*

Reactor Containment

Equipment inside containment is not in compliance with Section C.5.b of BTP CMEB 9.5-1 because redundant trains of safe shutdown components and circuitry are not separated by 3-hour walls or are not separated by 20 feet with no intervening combustibles. Generally, redundant cables inside the containment are run on opposite sides of the interior wall. Although this does not provide 3-hour separation, the wall is a significant barrier to fire and heat. Cables inside the containment are either qualified to IEEE Standard 383 or are run inside conduit. The only significant combustible loading other than cable is the oil inside the reactor coolant pumps,

RHR pumps, and the charcoal filters. The reactor coolant pumps are provided with an oil collection system in compliance with the SRP, which reduces the potential for spread of combustible oil. Both the RHR pumps and the charcoal filters are provided with detection and suppression systems. The penetration area, where redundant divisions are separated by at least 18 feet, is provided with detection and automatic suppression. Because of the low in situ combustibles and the containment's large volume, it is expected that any fire would develop slowly with the heat dissipated to the large air space. In addition, because access to the area is tightly controlled, it is not expected that transient combustibles would contribute to the fire loading. Therefore, there is reasonable assurance that a fire inside the containment would not jeopardize both trains of redundant safe shutdown equipment, and lack of complete separation of redundant trains of safe shutdown components inside containment is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.

Safe Shutdown Circuitry

In Amendment 14 to the FSAR, the applicant identified six fire areas where safe shutdown circuitry is not in compliance with Section C.5.b of BTP CMEB 9.5-1. The fire areas include cable vaults (CV-4 and CV-5), primary auxiliary building (PA-4), pipe tunnel (PT-1), south safeguards building (SG-1S), and the service building normal switchgear (SB-4). These fire areas deviate from the SRP because they do not contain automatic suppression in addition to detection and 1-hour separation. All six areas have a combustible loading of less than 1/2 hour and detection is provided. One train of circuitry is wrapped with 1-hour material in each of the six areas. It is expected that a fire would be detected in its incipient stage and the plant fire brigade would respond. All of the areas are provided with hose racks for fire brigade use. Providing automatic suppression in these areas would not significantly increase the level of fire protection. Therefore, the lack of area suppression for Fire Areas CV-4, CV-5, PA-4, PT-1, SG-1S, and SB-4 is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.

Electrical Cable Construction, Cable Trays, and Cable Penetrations

In the SER, the staff identified three fire areas where cable tray separation did not meet the guidelines of Section C.5.e (2) of BTP CMEB 9.5-1. They include the containment (RC-1) and the primary auxiliary building (PA-3 and PA-4). In Amendment 14 to the FSAR, the applicant provided clarification of this deviation and stated that continuous line-type detection was not provided in any safety-related cable trays; however, all areas containing safety-related cables had general area detection and all areas with concentrated cables, except for RC-1, PA-3, and PA-4, were provided with automatic suppression. As identified previously in the SER, the addition of automatic suppression in these three areas would not significantly enhance fire safety. Also, the general area detection provides adequate assurance that a fire in any safety-related cable will be detected in its incipient stage, making line-type heat detection unnecessary. Therefore, the lack of automatic suppression in fire areas RC-1, PA-3, and PA-4 and the lack of continuous-line type of heat

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detection in safety-related cable trays are acceptable deviations from Section C.5.b of BTP CMEB 9.5-1.

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The deviation for lack of separation of redundant trains for safe shutdown components is being transitioned to the new licensing basis under NFPA 805.

Only items 1 and 11 in the licensing basis are being transitioned as the other items have been analyzed as part of the NFPA 805 program and it was determined that the approval for items 2-10 is no longer required.

Disposition:

Licensing Action acceptable for transition

References:

- 10080-B-085, Revision 14, "Fire Hazard Analysis."
- 10080-RB-0003B, Revision 10, "Fire Protection Arrangement 718' to 735'."
- 10080-RB-0003E, Revision 5, "Fire Protection Arrangement 735' to 752'."
- 10080-RC-0037E, Sheet 5, Revision 8, "Wall Sections & Details Auxiliary Building."
- 2701.620-000-020, Revision A, "Detailed Fire Modeling Report - 2-CR-1."
- FPSSR, Addendum 37, "BVPS-2 Fire Protection Safe Shutdown Report."
- NUREG-1057, Supplement 3, "NRC SSER - NUREG-1057, Supplement 3 dated November 1986."
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- TER-13568, Revision 0, "IEEE-383-74 Cable Flame Test Comparative Analysis."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.4 - Compartment: 2-PA-3
Ch.4 - Compartment: 2-PA-3A
Ch.4 - Compartment: 2-PA-3B
Ch.4 - Compartment: 2-PA-3C
Ch.4 - Compartment: 2-RC-1
~~Fire Protection - Fire Compartment: 2-PA-3 / Form: Detection~~ FPE RAI 02
Fire Protection - Fire Compartment: 2-PA-3 / Form: Passive Protection
~~Fire Protection - Fire Compartment: 2-PA-3 / Form: Water Based Suppression~~ FPE RAI 02
Fire Protection - Fire Compartment: 2-PA-3A / Form: Passive Protection
Fire Protection - Fire Compartment: 2-PA-3B / Form: Passive Protection

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Fire Protection - Fire Compartment: 2-PA-3C / Form: Passive Protection
Fire Protection - Fire Compartment: 2-RC-1 / Form: Detection
Fire Protection - Fire Compartment: 2-RC-1 / Form: Water-Based Suppression

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Licensing Action: Safe Shutdown Circuitry - Lack of Separation of Redundant Trains - BTP C.5.b

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.b, states:

The Standard Review Plan states that one of the redundant trains is to be free of fire damage so that safe shutdown can be achieved. This can be achieved by:

a) Separating redundant trains by a fire barrier having a 3-hour rating.

b) Separating redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system should be installed in the fire area.

c) Enclosing one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system should be installed in the fire area.

Differences from the SRP:

The following areas have redundant circuitry and do not meet the guidelines of C.5.b, nor is alternate shutdown capability provided for the following areas except SB-4 which relies on the ASP for monitoring of certain instrumentation and ventilation control....

(1) Cable Vaults (CV-1, CV-2, CV-3, CV-4 and CV-5)

(2) Primary Auxiliary Building (PA-4)

(3) South Safeguards Building (SG-1S)

(4) Service Building Normal Switchgear (SB-4)

(5) Primary Auxiliary Building (PA-3)

(6) Alternate Shutdown Panel (ASP)

(7) Emergency Switchgear Rooms (SB-1 and SB-2)

(8) Service Building Cable Tray Area (SB-3)

(9) Reactor Containment (RC-1)

Justification:

(1) Fire Areas CV-4 and CV-5 contain redundant circuitry for various components of the emergency switchgear ventilation systems. The combustible loading for each area is less than 1/2 hour. All cables in these areas are routed in conduit. In addition, orange cables for the equipment have been adequately protected using a fire-wrap material. Fire detection for these areas consists of area ionization detectors which alarm locally and in the control room. Portable fire extinguishers are

located in these areas with manual hose stations located immediately adjacent to these areas. Based on the low combustible loading fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression is adequate to protect the hazard and provide the required separation.

(2) The auxiliary building, elevation 755 ft-6 in. contains redundant circuitry for various shutdown components. The combustible loading for this area is less than 1/2 hour. This area is compartmentalized for radiological and safety-related concerns.

Various cabling has been adequately protected using a fire-wrap material. Fire detection for these areas consists of area ionization detectors which alarm locally and in the control room. Portable fire extinguishers are located in the area and manual hose stations are located in the stairwells adjacent to this area. Based on the low amount of combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression available is adequate to protect the hazard and provide the required separation.

(3) The south safeguards building contains redundant circuitry for various components of the auxiliary feedwater system. The loading for the combustible fire area is less than 1/2 hour. Purple cables for this equipment have been adequately protected using fire-wrap material. Fire detection for this area consists of area ionization detectors which alarm locally and in the control room. Portable fire extinguishers and manual hose stations are located in this area. Based on the low combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression is adequate to protect the hazard and provide the required separation.

(4) The service building normal switchgear room contains redundant circuitry for the ventilation systems to the emergency diesel generator building. The combustible loading for this fire area is less than 1 hour. Orange cables for the equipment have been adequately protected using a fire-wrap material. Fire detection for this area consists of area ionization smoke detectors which alarm locally and in the control room. Portable fire extinguishers and manual hose stations are located in the area. Based on the low combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression is adequate to protect the hazard and provide the required separation.

(5) The auxiliary building, elevation 735 ft-6 in. contains redundant circuitry for various shutdown components. The combustible loading for this area is less than 1/2 hour. This area is compartmentalized for radiological and safety-related concerns. Various cabling has been adequately protected using a fire-wrap material. Fire detection for these areas consists of area ionization detectors which alarm locally and in the control room. Portable fire extinguishers are located in the area

and manual hose stations are located in the stairwells adjacent to this area. Based on the low amount of combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression available is adequate to protect the hazard and provide the required separation.

*(6) The charging system suction valve area which is located on the 718'-6" and 710'-6" elevations of the auxiliary building contains redundant circuitry for the charging pump suction valves 2CHS*LCV115D and B, 2CHS*MOV350 and 2CHS*FCV113A. The fire loading for this area is less than 1/2 hour. All cables in this area are routed in conduit. In addition, for radiation hazard reasons, these areas are restricted access and are out of normal plant travel routes. The cables for 2CHS*LCV115D have been adequately protected by a fire-wrap material. Due to the fact that only one out of the four valves has to operate, the area contains negligible combustibles and the area is provided with general area fire detection, hose racks and portable fire extinguishers; a fire in the area will not prevent safe shutdown and adequate separation is provided.*

(7) Spurious Operation of the PORVs

A deviation from the requirements of BTP CMEB 9.5-1, Section C.5.b has been identified relative to the separation of the electrical circuits of the pressurizer power operated relief valves and their associated motor operated block valves. The circuits for redundant valves which isolate the high-low pressure interface lines do not meet the separation criteria of C.5.b. A potential for spurious operation of the pressurizer power operated relief valves has been identified for fire areas ASP, CV-1, CV-2, CV-3, RC-1, SB-1, SB-2, and SB-3, and the normally open block valve could also be rendered inoperable. Alternate shutdown capability has not been provided for these fire areas. In the event of a serious fire in these areas, the operator will open the d-c circuit breakers to deenergize the electrical power to the PORV.

The PORV circuits affected are ungrounded 125 VDC circuits and are routed in thermoset cable. A single fire-induced cable-to-cable hot short will not result in spurious opening of the PORVs. With the power circuit deenergized, in order to open a single PORV, multiple shorts of the proper polarity, on thermo-set multiconductor cables, would be required.

EPRI TR-1003326, Characterization of Fire-Induced Circuit Failures: Results of Cable Fire Testing, Final Report December 2002, indicates that inter-cable (cable to cable) shorting is much less likely than intra-cable shorts. One area discussed by this report is the potential duration of spurious operation events. The testing strongly suggests that fire induced hot shorts will likely self-mitigate (e.g., short to ground) after some limited period of time. The test data shows that a majority of the circuit failures resulting in spurious operation had a duration of less than 1 minute. Less than 10% of all failures lasted more than 5 minutes, with the longest duration recorded for the tests equal to 10 minutes. From this it may be concluded that the chance of having two such faults at the same time on the specific conductors to

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cause a spurious actuation of sufficient duration to affect safe shutdown would be extremely unlikely.

BV Design Analysis Calculation No. 10080-DMC-0820 has determined that no core damage would occur in the event of a spurious PORV opening under credible fire protection scenarios.

Acceptability of this deviation is documented in accordance with 10080-DEC-0254.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines" states:

Safe Shutdown Circuitry

In Amendment 14 to the FSAR, the applicant identified six fire areas where safe shutdown circuitry is not in compliance with Section C.5.b of BTP CMEB 9.5-1. The fire areas include cable vaults (CV-4 and CV-5), primary auxiliary building (PA-4), pipe tunnel (PT-I), south safeguards building (SG-1S), and the service building normal switchgear (SB-4). These fire areas deviate from the SRP because they do not contain automatic suppression in addition to detection and 1-hour separation. All six areas have a combustible loading of less than 1/2 hour and detection is provided. One train of circuitry is wrapped with 1-hour material in each of the six areas. It is expected that a fire would be detected in its incipient stage and the plant fire brigade would respond. All of the areas are provided with hose racks for fire brigade use. Providing automatic suppression in these areas would not significantly increase the level of fire protection. Therefore, the lack of area suppression for Fire Areas CV-4, CV-5, PA-4, PT-1, SG-1S, and SB-4 is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

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Licensing Action #: 10

Licensing Action: Alternative or Dedicated Safe Shutdown Capability - Deviation When Protection or Separation is Not Adequate - BTP C.5.c(7)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), Section 9.5A, Item C.5.c, "Alternative or Dedicated Shutdown Capability" states:

Item C.5.c(7) requires that the alternate safe shutdown equipment and systems be isolated from associated circuits such that a postulated fire will not prevent safe shutdown. Alternate safe shutdown capability, which has been provided for fire areas CB-1, CB-2, CB-3, CB-6, and CT-1, does not provide for isolation of the pressurizer PORVs in the event of multiple cable-to-cable hot shorts. Technical justification for the alternate shutdown fire areas is the same as documented under C.5.b above.

Justification from "Safe Shutdown Circuitry," C.5.b:

(1) Fire Areas CV-4 and CV-5 contain redundant circuitry for various components of the emergency switchgear ventilation systems. The combustible loading for each area is less than 1/2 hour. All cables in these areas are routed in conduit. In addition, orange cables for the equipment have been adequately protected using a fire-wrap material. Fire detection for these areas consists of area ionization detectors which alarm locally and in the control room. Portable fire extinguishers are located in these areas with manual hose stations located immediately adjacent to these areas. Based on the low combustible loading fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression is adequate to protect the hazard and provide the required separation.

(2) The auxiliary building, elevation 755 ft-6 in. contains redundant circuitry for various shutdown components. The combustible loading for this area is less than 1/2 hour. This area is compartmentalized for radiological and safety-related concerns.

Various cabling has been adequately protected using a fire-wrap material. Fire detection for these areas consists of area ionization detectors which alarm locally and in the control room. Portable fire extinguishers are located in the area and manual hose stations are located in the stairwells adjacent to this area. Based on the low amount of combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression available is adequate to protect the hazard and provide the required separation.

(3) The south safeguards building contains redundant circuitry for various components of the auxiliary feedwater system. The loading for the combustible fire area is less than 1/2 hour. Purple cables for this equipment have been adequately protected using fire-wrap material. Fire detection for this area consists of area

ionization detectors which alarm locally and in the control room. Portable fire extinguishers and manual hose stations are located in this area. Based on the low combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression is adequate to protect the hazard and provide the required separation.

(4) The service building normal switchgear room contains redundant circuitry for the ventilation systems to the emergency diesel generator building. The combustible loading for this fire area is less than 1 hour. Orange cables for the equipment have been adequately protected using a fire-wrap material. Fire detection for this area consists of area ionization smoke detectors which alarm locally and in the control room. Portable fire extinguishers and manual hose stations are located in the area. Based on the low combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression is adequate to protect the hazard and provide the required separation.

(5) The auxiliary building, elevation 735 ft-6 in. contains redundant circuitry for various shutdown components. The combustible loading for this area is less than 1/2 hour. This area is compartmentalized for radiological and safety-related concerns. Various cabling has been adequately protected using a fire-wrap material. Fire detection for these areas consists of area ionization detectors which alarm locally and in the control room. Portable fire extinguishers are located in the area and manual hose stations are located in the stairwells adjacent to this area. Based on the low amount of combustible loading, the fire detection present, and the fact that redundant cabling required for shutdown has been provided with additional protection, the means of suppression available is adequate to protect the hazard and provide the required separation.

*(6) The charging system suction valve area which is located on the 718'-6" and 710'-6" elevations of the auxiliary building contains redundant circuitry for the charging pump suction valves 2CHS*LCV115D and B, 2CHS*MOV350 and 2CHS*FCV113A. The fire loading for this area is less than 1/2 hour. All cables in this area are routed in conduit. In addition, for radiation hazard reasons, these areas are restricted access and are out of normal plant travel routes. The cables for 2CHS*LCV115D have been adequately protected by a fire-wrap material. Due to the fact that only one out of the four valves has to operate, the area contains negligible combustibles and the area is provided with general area fire detection, hose racks and portable fire extinguishers; a fire in the area will not prevent safe shutdown and adequate separation is provided.*

(7) Spurious Operation of the PORVs

A deviation from the requirements of BTP CMEB 9.5-1, Section C.5.b has been identified relative to the separation of the electrical circuits of the pressurizer power operated relief valves and their associated motor operated block valves. The circuits for redundant valves which isolate the high-low pressure interface lines do not meet

the separation criteria of C.5.b. A potential for spurious operation of the pressurizer power operated relief valves has been identified for fire areas ASP, CV-1, CV-2, CV-3, RC-1, SB-1, SB-2, and SB-3, and the normally open block valve could also be rendered inoperable. Alternate shutdown capability has not been provided for these fire areas. In the event of a serious fire in these areas, the operator will open the d-c circuit breakers to deenergize the electrical power to the PORV.

The PORV circuits affected are ungrounded 125 VDC circuits and are routed in thermoset cable. A single fire-induced cable-to-cable hot short will not result in spurious opening of the PORVs. With the power circuit deenergized, in order to open a single PORV, multiple shorts of the proper polarity, on thermo-set multiconductor cables, would be required.

EPRI TR-1003326, Characterization of Fire-Induced Circuit Failures: Results of Cable Fire Testing, Final Report December 2002, indicates that inter-cable (cable to cable) shorting is much less likely than intra-cable shorts. One area discussed by this report is the potential duration of spurious operation events. The testing strongly suggests that fire induced hot shorts will likely self-mitigate (e.g., short to ground) after some limited period of time. The test data shows that a majority of the circuit failures resulting in spurious operation had a duration of less than 1 minute. Less than 10% of all failures lasted more than 5 minutes, with the longest duration recorded for the tests equal to 10 minutes. From this it may be concluded that the chance of having two such faults at the same time on the specific conductors to cause a spurious actuation of sufficient duration to affect safe shutdown would be extremely unlikely.

BV Design Analysis Calculation No. 10080-DMC-0820 has determined that no core damage would occur in the event of a spurious PORV opening under credible fire protection scenarios.

Acceptability of this deviation is documented in accordance with 10080-DEC-0254.

Evaluation:

NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

Alternate Shutdown Capability

The applicant has provided alternate shutdown capability for a fire in the instrumentation and relay room (CB-I), cable spreading room (CB-2), main control room (CB-3), west communication room (CB-6) and cable tunnel (CT-1) via the alternate shutdown panel (ASP), transfer switch panel and local stations outside the above areas. FSAR Section 7.4 and fire protection safe shutdown report Appendix A-2 describes the alternate shutdown panel capability and identifies the instrumentation and control located thereon. The alternate shutdown panel is located at elevation 755 feet, 6 inches in the auxiliary building and control one train (train A) of redundant shutdown components which are necessary for cold shutdown

of the plant. Transfer switches isolate the safe shutdown equipment cables from the affected fire areas to ensure independent control of the alternate shutdown panel.

The alternate shutdown capability provides direct reading and controls to monitor the process variables and take the necessary action to perform reactivity control, reactor coolant makeup/inventory control and reactor heat removal. The applicant has provided the following essential indications at the alternate shutdown panel independent of the control room for achieving and maintaining safe shutdown:

(1) pressurizer level

(2) reactor coolant system (RCS) wide-range pressure

(3) RCS wide-range hot-leg temperature

(4) RCS wide-range cold-leg temperature

(5) steam generator wide-range pressure

(6) steam generator wide-range level

(7) auxiliary feedwater flow to two steam generators

(8) source and startup-range reactor flux

The alternate shutdown panel also includes controls for the following essential systems or components:

(1) charging and boric acid pumps

(2) auxiliary feedwater (AFW) pump

(3) residual heat removal (RHR) pump

(4) component cooling water (CCW) pump

(5) service water pump

(6) charging pump flow control valve and suction isolation valve from the RWST

(7) letdown orifice, isolation and coolant recovery valves

(8) AFW flow control valves

(9) atmospheric steam dump valves

(10) pressurizer power operated relief valves

(11) pressurizer heaters

(12) nitrogen supply valves to safety injection accumulations

(13) RHR isolation valves

(14) CCW supply valve to RHR heat exchanger

(15) service water pump discharge valve and supply valve to diesel generator

(16) emergency diesel generator set and supply breakers

Local indications and controls will be used for other components required for shutdown.

The design of the alternate shutdown system complies with the performance goals outlined in Position C.5.c of BTP CMEB 9.5-1. Reactivity control is accomplished by (1) manual scram (before the operator leaves the control room), (2) boron addition via the chemical and volume control system (CVCS) using the refueling water storage tank or boric acid tank, and (3) controlling the RCS letdown. The reactor coolant makeup and pressure control functions are also performed by the charging pump, letdown and RWST. Reactor coolant inventory is ensured by maintaining reactor coolant pump seal injection and by isolating possible locations of inventory loss such as PORVs, RHR suction lines, letdown line and reactor head vents. RCS pressure control is also provided by the PORV or actuation of the pressurizer heaters. Heat is removed from the RCS by the AFW system, main steam safety valves or the power-operated main steam relief valves. When the RCS temperature falls to 350oF, the heat removal function is transferred to the RHR system. All these operations can be accomplished from outside the control room.

In addition to scramming the reactor from the control room, the applicant has included procedures for other actions that are to be performed before the control room is evacuated. These actions, however can be performed outside the control room regardless of circuit damage within the control room. They include, among other, tripping MSIVs, closing the PORV block valves and letdown isolation valves, and aligning the charging pump suction to the RWST. The above actions will prevent spurious actuations, failure of specific automatic functions, and the operation of other specific automatic functions from causing an unrecoverable condition. The transfer switches are designed so that even if fire damages the circuits before the position of a transfer switch is changed, fuse replacement is not required for equipment operation after the transfer is complete. Thus, the design of transfer switches adequately cover the concern identified in Inspection and Enforcement (IE) Information Notice 85-09, 'Isolation Transfer Switches and Post-Fire Safe Shutdown Capability.'

The staff has reviewed the actions required by the procedures for achieving and maintaining safe plant shutdown following a control room area fire. For hot standby, the immediate actions are primarily precautionary measures to ensure that no unacceptable spurious actuations take place because of a control room fire. Should they occur before these actions are accomplished, the procedures provide guidance for overcoming and correcting the inadvertent spurious actuations. The procedures also describe other operator actions at the ASP and local stations for safe hot and cold shutdown from outside the control room. Portable ventilation may have to be provided for the charging pump cubicles within 24 hours, as described previously. Repairs for opening the containment isolation valves for the component cooling water and service water systems may be required for cold shutdown. Repairs

BVPS-2

Licensing Action #: 10

Licensing Action: Alternative or Dedicated Safe Shutdown Capability - Deviation When Protection or Separation is Not Adequate - BTP C.5.c(7)

consist of lifting leads, installing jumpers, and replacing fuses. Component cooling water provides cooling to the RHR heat exchangers. Service water provides cooling water to the containment air recirculation coils for RHR pump room ventilation. Portable ventilation and other materials for repairs are stored in a dedicated area on site. The staff has reviewed the proposed actions and manpower requirements for alternate safe shutdown and concludes they are in accordance with Position C.5.c of BTP CMEB 9.5-1, including the use of portable ventilation for the charging pump cubicles and repairs of valves for cold shutdown, since they can be accomplished exclusive of fire brigade members.

On the basis of its review, the staff concludes that the alternate shutdown capability complies with the requirements of GDC 3 and the criteria of Appendix R, Section III.L as contained in SRP Section 9.5.1, and BTP CMEB 9.5-1, Position C.5.c and is, therefore acceptable. This closes the alternate shutdown part of open issue 5.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 11

Licensing Action: Hydrogen Piping - Deviation in Seismic Classification - BTP C.5.d(5)

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: Yes

Basis:

The "BVPS-2 Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.d(5), states:

The SRP states that hydrogen lines in safety-related areas should be either designed to seismic Class I requirements, or sleeved such that the water pipe is directly vented to the outside, or should be equipped with excess flow valves so that in case of a line break, the hydrogen concentration in the affected areas will not exceed 2 percent.

Difference From the SRP:

The term 'Seismic Class I' is undefined and the Regulatory Guide 1.29 classification 'Seismic Category I' is not applicable to hydrogen piping at BVPS-2 as described in the Regulatory Guide.

Justification:

BVPS-2 has seismically designed all hydrogen piping in safety-related areas to Seismic Category II requirements, as defined in UFSAR Section 3.2.1.2. This piping is designed and supported to withstand SSE inertia loading, and the integrity of the pressure boundary is maintained in accordance with Appendix F of the 1972 ASME Code Winter Edition which states that the faulted condition design procedures contained in subparagraph F-1300 are provided for limiting the consequences of the specified event. They are intended (see NA-1130) to assure that violation of the pressure retaining boundary will not occur in components or supports which are in compliance with these procedures. Therefore, the pressure boundary of piping designed in accordance with these criteria will remain intact during a seismic event and no leakage will result.

Evaluation:

The NRC SER - NUREG-1057, Section 9.5.1.4, "General Plant Guidelines," states:

Control of Combustibles

Safety-related systems have been isolated or separated from combustible materials as much as possible. The storage of flammable liquids complies with National Fire Protection Standard 30 (NFPA 30). Compressed gases are stored either outdoors or in non-safety-related structures whenever possible. Hydrogen piping, however, passes through safety-related areas.

By letter dated May 23, 1984, the applicant committed to provide hydrogen piping that is seismically designed and supported to withstand the SSE. This design will ensure that the piping will remain intact during a seismic event.

On the basis of its evaluation, the staff concludes that the hydrogen piping meets Section C.5.d of BTP CMEB 9.5-1 and is, therefore, acceptable.

BVPS-2

Licensing Action #: 11

Licensing Action: Hydrogen Piping - Deviation in Seismic Classification - BTP C.5.d(5)

Validation/Conclusions:

The bases for previous acceptance (Seismic Category II requirements) remain valid as described in the applicable sections above. The deviation for the seismic classification of the hydrogen piping in safety-related areas is being transitioned to the new licensing basis under NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 10080-RM-0071A, Revision 25, "Flow Diagram H2 & CO2 Supply Piping."
- 10080-RP-0052A, Revision 4, "H2 and CO2 Supply Piping."
- 10080-RP-0110J, Sheet 9, Revision 6, "Auxiliary Building Piping."
- 10080-RP-0110K, Sheet 10, Revision 5, "Auxiliary Building Piping."
- ASME, Revision 1972, "Code Winter Edition."
- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.4 - Compartment: 2-PA-4

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Licensing Action #: 12

Licensing Action: Continuous Line-Type Heat Detectors - Deviation for Alternative Fire Detection - BTP C.5.e(2)

Basis Date: May 1987 (NUREG-1057; Supplement 5)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), under Section 9.5A.2, Item C.5.e(2), states:

The Standard Review Plan states that cable trays containing portions of redundant safety-related cable systems outside the cable spreading room should be provided with continuous line-type heat detectors.

Difference from the SRP:

BVPS-2 has been equipped with alternate means of detecting cable fires.

Justification:

Safety-related cable areas are provided with smoke detectors as part of the early warning detection system and will annunciate in the main control room and alarm locally. General area coverage smoke detector systems are provided in all areas containing safety-related cables except the reactor containment building (See deviation documented for Containment - General Area Detection, Item C.7.a(l)(c)). The response time of smoke detectors is at least as effective in detecting cable fires as the line-type heat detectors.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

Electrical Cable Construction, Cable Trays, and Cable Penetrations

In the SER, the staff identified three fire areas where cable tray separation did not meet the guidelines of Section C.5.e (2) of BTP CMEB 9.5-1. They include the containment (RC-1) and the primary auxiliary building (PA-3 and PA-4). In Amendment 14 to the FSAR, the applicant provided clarifications of this deviation and stated that continuous line-type detection was not provided in any safety related cable trays; however, all areas containing safety-related cables had general area detection and all areas with concentrated cables, except for RC-1, PA-3, and PA-4, were provided with automatic suppression. As identified previously in the SER, the addition of automatic suppression in these three areas would not significantly enhance fire safety. Also, the general area detection provides adequate assurance that a fire in any safety-related cable will be detected in its incipient stage, making line-type heat detection unnecessary. Therefore, the lack of automatic suppression in fire areas RC-1, PA-3, and PA-4 and the lack of continuous-line type of heat detection in safety-related cable trays are acceptable deviations from Section C.5.b of BTP CMEB 9.5-1.

BVPS-2

Licensing Action #: 12

Licensing Action: Continuous Line-Type Heat Detectors - Deviation for Alternative Fire Detection - BTP C.5.e(2)

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 13

Licensing Action: Concentrated Cable Trays in Reactor Containment and Auxiliary Building - Deviation for Fire Protection Features - BTP C.5.e(2)

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.e (2), states:

The Standard Review Plan states that manual hose stations may be relied upon to provide the primary suppression for safety-related cable trays of a single division that are separated from redundant cables by a 3-hour fire barrier and are normally accessible for manual firefighting if all of the following conditions are met:

(a) The number of equivalent standard 24 in. wide cable trays is six or less,

(b) The cabling does not provide instrumentation control, or power to systems required to achieve and maintain hot shutdown, and

(c) Smoke detectors are provided in the area of these cable routings, and continuous line-type heat detectors are provided in the cable trays.

Difference from the SRP:

The following areas do not have automatic fire suppression and are provided with cable trays that:

a) Exceed six trays

b) Contain cabling necessary for shutdown

c) Are not provided with continuous line-type heat detectors:

Reactor Containment (RC-1)

Auxiliary Building (PA-3 and PA-4)

Justification:

The reactor containment (Fire Area RC-1) contains concentrations of cable trays in excess of the six tray limit between the crane wall and containment wall, which have not been provided with automatic suppression. The cables in these trays are all IEEE-383 for safety related applications or similarly qualified for non-safety applications (Refer to Section 8.3.3 for further details), and the trays with major power cables ("L" and "H" cables) have been provided with metal tray covers. The cable trays have been laid out such that all trays can be effectively reached by a fire hose stream, and the fire severity for the reactor containment is less then 1 hour. The safe shutdown analysis summary for this area is provided in Section 9.5A.1.3.29 and demonstrates that safe shutdown is not prevented by a fire in the cable trays.

The Auxiliary Building (Fire Areas PA-3 and PA-4) contains four 30-inch wide cable trays. This exceeds the limit of six 24-inch wide trays as defined in BTP CMEB 95-1. These areas that contain slightly higher than recommended cable tray concentration have been laid out such that all trays can be effectively reached by a hose stream.

BVPS-2

Licensing Action #: 13

Licensing Action: Concentrated Cable Trays in Reactor Containment and Auxiliary Building - Deviation for Fire Protection Features - BTP C.5.e(2)

The early warning smoke detection system assures that the fire brigade has sufficient time to respond to a fire. The fire severity for PA-3 and PA-4 is less than 1/2 hour each. Transient combustibles are administratively controlled and do not constitute a significant increase in combustible loading. The safe shutdown summaries for PA-3 and PA-4 (see Sections 9.5A.1.3.23 and 24, respectively) demonstrate that safe shutdown is not prevented by a fire in these areas. The smoke detection system, the fact that only IEEE-383 for safety related applications or similarly qualified cables for non-safety applications (Refer to Section 8.3.3 for further details) are used, required safe shutdown cables are adequately protected in place by a fire wrap material for PA-3 and PA-4, and the accessibility of all cable trays to fire hose streams, provide adequate assurance that any postulated fire can be readily contained and that safe shutdown is not prevented.

Evaluation:

The NRC SER - NUREG-1057, Section 9.5.1.4, "General Plant Guidelines," states:

Electrical Cable Construction, Cable Trays, and Cable Penetrations

Cable trays are of all-metal construction. Electrical cable construction passes the Institute of Electrical and Electronics Engineers (IEEE) 383-1974 flame test. The cables are designed to allow wetting down with fire suppression water without electrical faulting.

Safety-related cable trays outside the cable spreading room are separated from potential fire exposure hazards by either 3-hour-rated fire barriers, 1-hour rated fire barriers with automatic suppression, or 20 feet of separation with automatic suppression.

Except for the following three areas, all areas containing cable trays are provided with early warning smoke detectors:

(1) containment (fire area RC-1)

(2) auxiliary building (fire area PA-3)

(3) auxiliary building (fire area PA-4)

All areas containing concentrated cable trays are provided with automatic total flooding carbon dioxide systems. The three areas listed above have eight or fewer cable trays, spread out over a large area. The cable tray configuration permits a hose stream to be effectively applied. On the basis of its evaluation, the staff concludes that the fire protection safety of these configurations would not be greatly enhanced by the addition of automatic suppression.

On the basis of its evaluation, the staff concludes that the protection provided for the cable trays and the approved deviations meet Section C.5.e of BTP CMEB 9.5-1 and are, therefore, acceptable.

BVPS-2

Licensing Action #: 13

Licensing Action: Concentrated Cable Trays in Reactor Containment and Auxiliary Building - Deviation for Fire Protection Features - BTP C.5.e(2)

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."

Associations:

None

BVPS-2

Licensing Action #: 14

Licensing Action: Cable Rooms - CO2 versus Water Fire Suppressant - BTP C.5.e(2)

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), Section 9.5A.2, Item C.5.e(2), states:

The SRP states that in other areas where it may not be possible because of other overriding design features necessary for reasons of nuclear safety to separate redundant safety-related cable systems by 3-hour-rated fire barriers, cable trays should be protected by an automatic water system with open-head deluge or open directional spray nozzles arranged so that adequate water coverage is provided for each cable tray. Such cable trays should also be protected from the effects of a potential exposure fire by providing automatic water suppression in the area where such a fire could occur. The capability to achieve and maintain safe shutdown considering the effects of a fire involving fixed and potential transient combustibles should be evaluated with and without actuation of the automatic suppression system and should be justified on a suitably defined basis.

Difference from the SRP:

The following fire areas use CO2 as the primary automatic suppressant instead of water:

a) Control Building (Fire Areas CB-1, CB-2, and CT-1)

b) Cable Vaults (CV-1, 2, and 3)

c) Service Building Elevation 745 ft-6 in. (SB-4)

Justification:

The automatic or manual, double-capacity, total flooding CO2 system, in conjunction with the hose rack stations and portable fire extinguishers, provides adequate protection to extinguish fires and ensure the safety of these areas.

Two potential fires are postulated for these areas: a short-circuit-induced cable fire and a fire involving transient combustibles. Hazardous quantities of transient combustibles are not expected in these areas for several reasons. First, the areas are not near any major plant traffic route. Second, maintenance and operations in these areas do not involve the use of combustible materials. Third, accessibility to these areas is restricted to personnel performing essential duties. The potential for a cable fire is limited by the use of IEEE 383 for safety related applications or similarly qualified cable for non-safety applications throughout (Refer to UFSAR Section 8.3.3 for further details). The cable trays are provided with cable tray covers and/or bottoms to conform with Regulatory Guide 1.75.

Fire detection is provided by the early warning fire detection system which provides fire alarms locally and in the control room.

BVPS-2

Licensing Action #: 14

Licensing Action: Cable Rooms - CO2 versus Water Fire Suppressant - BTP C.5.e(2)

The CO2 system is designed to attain a 50-percent concentration as recommended for cable fires (NFPA-12). Automatic actuation of the CO2 system is provided by the "XL-3" fire detection system which is a "Priority" system with local and control room alarms. The alarms enable the control room to be aware of the status and availability of the CO2 system at all times. A timed delay is provided in the CO2 initiation cycle to provide for personnel evacuation. CO2 supply capacity is available for a second manual application. CO2 will penetrate to the source of the fire and is less likely to cause damage to electrical equipment. Hose racks are provided at the entrance to the cable spreading room, and all trays can be reached by hose streams.

Penetrations to these areas are sealed to prevent leakage of CO2 to occupied spaces. Operating personnel of Unit 1 have had several years of experience with total flooding CO2 systems. All personnel are trained in alarm recognition and evacuation procedures. The systems are generally disarmed only during an outage for major maintenance functions, and a fire watch is posted during the disarmed period. The system is not disarmed during daily operational activities in the area. In the unlikely event of a fire in this area, the fire brigade would be required to have breathing apparatus.

The cable trays located in these areas are utilized largely for instrumentation and control cables. These trays will be provided with flat, unventilated covers and/or bottoms. The presence of tray covers inhibits the ability of water to reach potential tray fires. CO2 by virtue of its gaseous state, will penetrate into the cable trays and provide fire suppression to the fire in its incipient stage and will prevent a deep-seated fire from occurring. Due to the stack arrangements of the cable trays and the fact that the trays are provided with covers and/or bottoms, a ceiling-mounted automatic water suppression system would not provide adequate assurance that a fire will be extinguished.

Evaluation:

The NRC SER - NUREG-1057, Section 9.5.1.6, "Fire Protection of Specific Plant Areas," states:

Cable Spreading Room

The cable spreading room is separated from the balance of the plant by 3-hour fire-rated walls and floor/ceiling assemblies. All penetrations through fire-rated barriers are fitted with 3-hour-fire-rated dampers and/or 3-hour-fire rated penetration seals.

An alternate shutdown system has been provided for the cable spreading room. The alternate shutdown system is reviewed in Section 9.5.1.4 of this report.

In the final draft SER, the staff reported that the automatic carbon dioxide extinguishing system provided for the cable spreading room as the primary extinguishing system, with manual hose stations as a backup, did not meet Position C.7.c of BTP CMEB 9.5-1. Position C.7.c of BTP CMEB 9.5-1 requires that the primary fire suppression system for a cable spreading room be an automatic water system, and any deviations should be justified.

BVPS-2

Licensing Action #: 14

Licensing Action: Cable Rooms - CO2 versus Water Fire Suppressant - BTP C.5.e(2)

In a letter dated May 30, 1984, the applicant identified the staff's requirements on fire suppression in the cable spreading room as a backfit. The applicant referenced NRC Manual Chapter 0514 (enclosure to Generic Letter 84-08) and requested that the staff requirements be submitted to NRC management for review.

As a result of the applicant's request, a backfit appeal meeting was held by the Director, Division of Licensing (DL), on February 28, 1985 followed by a March 13, 1985 site visit to obtain additional information. On the basis of the information presented at the backfit appeal meeting, information obtained from the site visit, and information obtained from some technical reports, a decision by the Director, DL, was rendered on the applicant's appeal, and the results are presented below.

The staff had two major concerns about the use of the carbon dioxide System as the primary fire suppression system in the cable spreading room. One was the effectiveness of carbon dioxide in extinguishing deep-seated cable fires, and the other was the accessibility within areas of the cable spreading room for manual fire fighting.

Recent fire tests performed by Sandia Laboratory and reported in draft NUREG/ CR-3656 showed that carbon dioxide is an adequate suppressive agent for extinguishing cable fires.

In the applicants Fire Protection Evaluation Report, the applicant has demonstrated that the design of the carbon dixoide system for concentration, anoxia and toxicity, thermal shock, overpressurization, and location of detectors is in accordance with Position C.6.d of BTP CMEB 9.5-1.

The Director, DL, concluded that the carbon dioxide extinguishing system with manual hose streams as a backup will provide an adequate level of protection for the cable spreading room and is, therefore, an acceptable deviation from the SRP guidelines.

On March 13, 1985, the staff made a site visit to the cable spreading room to determine the accessibility of the room for manual firefighting during periods of limited visibility.

On the basis of the site visit, the Director, DL, concluded that personnel accessibility for manual firefighting, although not close to being ideal, was demonstrated for the existing passageways in the cable spreading room.

However, to provide reasonable assurance that adequate accessibility exists for passageways during periods of limited visibility, the applicant should implement the recommendations provided by DLC's human factors expert in his letter to the NRC dated April 15, 1985. Furthermore, the temporary ramps and platforms needed to facilitate passage should be replaced with permanent installations that are of sufficient size and design to allow safe passage for firefighters. Training of the fire brigade should include walkthroughs in full equipment under anticipated conditions of limited visibility impaired communications, and high temperature. Simulation of these conditions either in the cable spreading room or at a fire training facility would be acceptable.

BVPS-2

Licensing Action #: 14

Licensing Action: Cable Rooms - CO2 versus Water Fire Suppressant - BTP C.5.e(2)

*In addition, during the March 13, 1985 site visit, the Director, DL, concluded that there was not reasonable assurance that a hose stream would be able to reach the dense cable tray array in the northwest corner of the cable spreading room in order to extinguish deep-seated fires inside the array. The Director, DL, considers this a deviation from the SRP, and a justification acceptable to the staff is required.**

NOTE: This deviation was subsequently approved and documented in NRC SSER 5, per the following:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.6, 'Fire Protection of Specific Plant Areas,' states:

Cable Spreading Room

In the SER, the staff raised concerns regarding the use of automatic CO2 in the cable spreading room. As a result, the applicant made certain modifications to ensure that fire brigade members could adequately access all areas of the room. In SSER 3, the staff indicated that this issue would remain as backfit issue 7 pending a site visit which would verify that (1) the applicant had implemented the recommendations provided by a human factors expert in a letter dated March 18, 1985, (2) the temporary ramps and platforms needed to facilitate passages had been replaced with permanent versions, and (3) training was provided to the fire brigade. The staff identified a fourth item, the reach of hose streams to the northwest corner, as a deviation and requested the applicant to justify their design. In Amendment 14 to the FSAR, the applicant identified the cable spreading room as a deviation and provided a detailed discussion of the room's fire protection features. During the site audit, the room was reviewed against Items 1, 2, and 3 of SSER 3. The staff noted that issues identified by the human factors expert have been corrected, permanent ramps have been installed to ease accessibility to certain areas, and training procedures were reviewed to ensure that the cable spreading room is specifically addressed. Thus, the issues identified in previous evaluations have been adequately addressed by the applicant, and backfit issue 7 is considered closed. The applicant's deviation request in Amendment 14 to the FSAR was also reviewed and found to adequately resolve previous concerns. Therefore, the existing fire protection for the cable spreading room is an acceptable deviation from Section C.7.c of BTP CMEB 9.5-1.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."

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Licensing Action #: 14

Licensing Action: Cable Rooms - CO2 versus Water Fire Suppressant - BTP C.5.e(2)

Associations:

None

BVPS-2

Licensing Action #: 15

Licensing Action: Control Room Ventilation - Deviation in the Redundant Ventilation System Control Location - BTP C.5.f(3)

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: No

Basis:

The BVPS-2 FSAR, "Beaver Valley Unit 2 Updated Final Safety Analysis Report," in Section 9.5A.2, Item C.5.f(3), reports:

The SRP states that power supply and controls for mechanical ventilation systems should be run outside the fire area served by the system where practical.

Difference from the SRP:

The controls for the redundant ventilation systems serving the control room are located in the control room.

Justification:

BVPS-2 relies on several alternate methods of ventilating the control room if necessary.

The primary smoke removal for the BVPS-2 control room is provided by one of the two 100-percent capacity fans of the control room air conditioning system. If a single fire renders both fans inoperable, other methods of smoke removal are available. Since this is a common control room for both Units 1 and 2, the Unit 1 ventilation system, which is completely separated from the Unit 2 system, can be utilized. If additional smoke removal is required, the double doors to the outside can be opened for natural ventilation. If further ventilation is necessary, two portable gasoline driven emergency exhaust fans can be utilized. These fans are part of the fire brigade equipment inventory located in the brigade staging area.

Evaluation:

The NRC SER - NUREG-1057, Section 9.5.1.4, "General Plant Guidelines," states:

The power supply controls for the redundant ventilation systems provided for the control room are located in the equipment room without separation.

The primary smoke removal for the control room is provided by one of the two 100% capacity fans of the control room A/C system. If a single fire renders both fans inoperable, the Unit 1 ventilation system, which is completely separated from the Unit 2 system, can be used. If additional smoke removal is required, the double doors to the outside can be opened for natural ventilation. If further ventilation is necessary, portable exhaust fans can be utilized. These fans are part of the fire brigade equipment inventory located in the brigade staging area.

Because three diverse methods of cooling the control room are provided, the staff finds this an acceptable deviation from its guidelines.

BVPS-2

Licensing Action #: 15

Licensing Action: Control Room Ventilation - Deviation in the Redundant Ventilation System Control Location - BTP C.5.f(3)

Validation/Conclusions:

The redundant ventilation system control location is no longer required by NFPA 805; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."

Associations:

None

BVPS-2

Licensing Action #: 16

Licensing Action: Lighting of Yard Areas - Lack of Eight-Hour Battery-Powered Lights - BTP C.5.g(1)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), in Section 9.5A.2, Item C.5.g(1), states:

The SRP states that fixed self-contained lighting consisting of fluorescent or sealed-beam units with individual 8-hour minimum battery power supplies should be provided in areas that must be manned for safe shutdown and for access and egress routes to and from all fire areas.

Difference from the SRP:

BVPS-2 is equipped with emergency lighting for access and egress routes used in performance of alternate shutdown procedures. For outside yard areas, an alternate form of lighting is used for such routes. The fire brigade room has 2-hour rated emergency lighting instead of 8-hour rated lighting.

Justification:

For certain fire scenarios, the operators may be required to follow outdoor pathways to achieve and maintain safe shutdown from outside the control room.

The security perimeter lighting system consists of permanently mounted lights on poles and on outside building walls. This permanent lighting system is powered from motor control center MCC-I-37 located in the security guardhouse which, on loss of offsite power, would be supplied from the security diesel generator (NHS-EG-1). This emergency diesel generator has a fuel supply capable of operating for at least 24 hours. This system is common for both Units 1 and 2.

The security perimeter lighting circuits powered from MCC-1-37 are not routed through any fire areas where safe shutdown equipment or cables are located. For all BVPS-2 fire areas of concern, the security diesel generator and transfer circuitry are independent.

Operators performing the alternate safe shutdown procedure are provided with flashlights to enhance the permanently installed outdoor yard area emergency lighting system. Portable lighting would supplement the fixed emergency lighting system to provide versatility and effectiveness for operators to perform their intended shutdown functions.

The security perimeter lighting system would provide emergency outside yard area lighting capability equivalent to the guidelines of BTP CMEB 9.5-1 (8-hour battery power supply) based on the following:

a. The security perimeter lighting system including its emergency power supply are independent of fire areas where control room evacuation may be required under the postulated fire scenario.

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Licensing Action #: 16

Licensing Action: Lighting of Yard Areas - Lack of Eight-Hour Battery-Powered Lights - BTP C.5.g(1)

b. The security lighting system provides an acceptable margin of safety equivalent to the guidelines of BTP CMEB 9.5-1.

c. Use of portable flashlights would offer more flexibility with respect to aiming which may be needed for unexpected transient hazards or any unanticipated events.

The 2-hour rated emergency lighting is adequate for the fire brigade room. The expected time duration for use of the fire brigade room as a staging area would be less than 30 minutes; therefore, 2-hour lighting is acceptable.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

Lighting and Communication

In the SER, the staff stated that fixed, self-contained lighting units with individual 8-hour battery-powered supplies are installed in all areas that will be staffed for shutdown and in all areas for access to and egress from all fire areas. In Amendment 14 to the FSAR, the applicant identified a deviation from Section C.5.9(1) of BTP CMEB 9.5-1 because certain yard areas are used for access routes to and from alternate shutdown areas and separate battery-powered lights were not provided. The applicant stated that lighting for these exterior routes is provided by the security lighting system. The security lighting system is powered by a dedicated diesel generator, which operates in the event of a loss of normal power supplied to the security system. The security diesel generator is separate from the main plant and the control room. A fire in any area requiring alternate shutdown will not cause loss of security lighting. The security generator has a sufficient capacity and fuel supply to power the yard lighting for the 8-hour specified time period. The applicant also stated that operators are provided with portable flashlights to enhance the emergency lighting system. There is reasonable assurance that adequate lighting for required yard areas is provided and that the lack of 8-hour battery-powered emergency lighting units in the outside yard areas will not prevent the plant from safely shutting down. Therefore, the use of the security lighting system for outside areas in lieu of battery-powered lights is an acceptable deviation from Section C.5.g(1) of BTP CMEB 9.5-1.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

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Licensing Action #: 16

Licensing Action: Lighting of Yard Areas - Lack of Eight-Hour Battery-Powered Lights - BTP C.5.g(1)

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 17

Licensing Action: Fire Detection - Lack of Detection in Areas with No Combustible Loadings - BTP C.6.a(1)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), Section 9.5A.2, Item C.6.a (1), states:

The Standard Review Plan states that detection systems should be provided for all areas that contain or present a fire exposure to safety-related equipment.

Difference from the SRP:

Certain areas that contain safety-related piping required for safe shutdown and which do not contain or present a fire hazard (that is, any cables present are in conduit, and any oils present are contained in valves, piping, or pumps) will not be provided with fire detection coverage.

Justification:

Fire detection coverage is provided within areas that contain safety-related equipment/cables required for safe shutdown and where combustible loadings (cables and oils), which could present a fire hazard, are normally present. The only safety-related equipment required for safe shutdown contained in the areas described above is the piping associated with the charging, service water, and component cooling water systems. These areas do not contain or present a fire hazard as defined above. Also, hazardous quantities of transient combustibles would not be expected in these areas for the following reasons:

a) These areas are not adjacent to or near any major plant traffic route.

b) Storage of transient combustibles in these areas is prohibited by plant administrative procedures.

c) Maintenance and operations activities in these areas do not involve the use of large quantities of combustible materials.

d) The accessibility to these areas is restricted due to the security system.

Table 9.5A-3 provides the list of areas where fire detection coverage is not provided since they do not contain or present a fire hazard as defined above.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.5, "Fire Detection and Suppression," states:

Fire Detection:

During the site audit on January 27-30, 1987, it was observed that smoke detection was not provided in areas containing the boric acid storage tanks, charging system suction valves, and auxiliary feedwater control valves as identified in Amendment 14 to the FSAR. Plant installation drawings were reviewed and it appeared that these

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Licensing Action #: 17

Licensing Action: Fire Detection - Lack of Detection in Areas with No Combustible Loadings - BTP C.6.a(1)

areas were overlooked. For this reason, the applicant was required to completely review smoke detector installations and to notify the staff that all areas requiring detection have been identified and that detectors have been installed. By letter dated March 5, 1987, the applicant stated that smoke detector installations had been reviewed. As a result of this review, eight areas were identified in which detection should have been installed but had not been and four areas were identified in which there were no plans to install detectors. The applicant indicated that the eight areas will be provided with the required fire detection. In an FSAR revision, the applicant identified the four areas (Fire Areas PA-3, PT-1, SG-1N and SG-1S) as a deviation from Section C.6a(1) BTP CMEB 9.5-1 because general area detection has not been provided. However, the applicant stated that all areas containing combustible materials or that represent a potential exposure to safety-related equipment are provided with detection. On the basis of this information, the deviation from lack of general area detection for the four areas identified is acceptable.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- 1/2-ADM-1900, Revision 27, "Fire Protection Program."
- 1/2-ADM-1906, Revision 7, "Control of Transient Combustible and Flammable Materials."
- 2OST-33.16D, Revision 0, "Early Warning Smoke Detection Instrumentation Test Auxiliary Building and MSCV Building."
- 2PFP-AXLB-718, Revision 1, "Auxiliary Building General Area Fire Area PA-3."
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

None

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Licensing Action #: 18

Licensing Action: Fire Hydrant - Deviation in Spacing - BTP C.6.b (7)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: Yes

Basis:

The BVPS-2 "Updated Final Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, Item C.6.b(7), states:

The Standard Review Plan states that hydrants should be installed approximately every 250 feet on the yard main system.

Difference from the SRP:

Fire Hydrant No. 16, located outside of the southwest corner of the Turbine Building, is located 340 feet from Fire Hydrant No. 15 which is located outside of the South Office Shops Building.

Justification:

Fire Hydrant No. 16 has been relocated due to field interferences. Sufficient lengths of hose have been provided in the associated hose cart houses to provide coverage in the event of a fire. The specific hazards in the area are the main transformer and the two station service transformers. These transformers have been provided with automatic deluge suppression systems.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.5, "Fire Detection and Suppression," states:

Fire Protection Water Supply System

During the site audit, the applicant stated that fire hydrant 16, located at the southwest corner of the turbine building, was relocated because it interfered with the installation of the auxiliary boiler and the security perimeter fence, thus providing a 370-foot spacing indicated in Section C.6.b(7) of BTP CMEB 9.5-1. The area was observed during the audit and coverage for nearby hazards appeared adequate. Therefore, the spacing between hydrants 15 and 16 is an acceptable deviation from the SRP.

Validation/Conclusions:

The bases for previous acceptance are still valid as described in the applicable sections above. The deviation for fire hydrant spacing is being transitioned to the new licensing basis per NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 10080-RB-0002A, Sheet 1, Revision 13, "Yard Piping Underground."

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Licensing Action #: 18

Licensing Action: Fire Hydrant - Deviation in Spacing - BTP C.6.b (7)

- 10080-RB-0002C, Sheet 3, Revision 6, "Yard Piping Underground."
- 10080-RB-0003B, Revision 10, "Fire Protection Arrangement 718' to 735'."
- 10080-RM-0433-001F, Revision 10, "Valve Operation Number Diagram Fire Protection Water Conditioning Polishing Building/Waste Handling Building/Yard."
- 2OST-33.2B, Revision 12, "Fire Protection Hose Stations Inspection, Flush, & Hose Replacement."
- 8700-RB-0002V, Sheet 5, Revision 4, "General Arrangement Fire Protection."
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.3 - Section: 3.5 / Subsection: 3.5.15

BVPS-2

Licensing Action #: 19

Licensing Action: Containment - Lack of General Area Detection - BTP C.7.a(1)(c)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), Section 9.5A.2, Item C.7.a(1)(c), states:

The Standard Review Plan states that general area fire detection capability should be provided in the primary containment as backup to detection systems for specific hazards.

Difference from the SRP:

The reactor containment is not provided with a general area detection system.

Justification:

Specific hazards within the reactor containment are provided with fire detection systems. The residual heat removal (RHR) pumps and cable penetrations are provided with smoke detectors and a water spray deluge system. The iodine charcoal filters are provided with heat detectors and a water spray deluge system. The reactor coolant pumps have been provided with an oil collection system.

Due to the compartmentalization of the containment, the fact that fire detection is provided for specific hazards, the low amount of transient combustibles, and the large volume of the containment along with the dilution caused by the ventilation high recirculation flow, general area fire detection would be ineffective.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

Reactor Containment

Equipment inside containment is not in compliance with Section C.5.b of BTP CMEB 9.5-1 because redundant trains of safe shutdown components and circuitry are not separated by 3-hour walls or are not separated by 20 feet with no intervening combustibles. Generally, redundant cables inside the containment are run on opposite sides of the interior wall. Although this does not provide 3-hour separation, the wall is a significant barrier to fire and heat. Cables inside the containment are either qualified to IEEE Standard 383 or are run inside conduit. The only significant combustible loading other than cable is the oil inside the reactor coolant pumps, RHR pumps, and the charcoal filters. The reactor coolant pumps are provided with an oil collection system in compliance with the SRP, which reduces the potential for spread of combustible oil.

Both the RHR pumps and the charcoal filters are provided with detection and suppression systems. The penetration area, where redundant divisions are separated by at least 18 feet, is provided with detection and automatic suppression. Because of the low insitu combustibles and the containment's large volume, it is

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Licensing Action #: 19

Licensing Action: Containment - Lack of General Area Detection - BTP C.7.a(1)(c)

expected that any fire would develop slowly with the heat dissipated to the large air space. In addition, because access to the area is tightly controlled, it is not expected that transient combustibles would contribute to the fire loading. Therefore, there is reasonable assurance that a fire inside the containment would not jeopardize both trains of redundant safe shutdown equipment, and lack of complete separation of redundant trains of safe shutdown components inside containment is an acceptable deviation from Section C.5.b of BTP CMEB 9.5-1.

ECP 08-0168 removed the combustible charcoal from the Containment Iodine Filtration System. This fire protection is no longer required.

ECP 08-0711 will mechanically and electrically isolate, and abandon-in-place, the portion of the fire suppression system located downstream of zone isolation valves 2FPW-390 & 2FPW-377 that once protected the Containment Iodine Filtration System.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 20

Licensing Action: Control Room - Deviation in Fire Protection Features - BTP C.7.b

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), Section 9.5A.2, Item C.7.b, states:

The SRP states that:

a. Peripheral rooms in the control room complex should have automatic water suppression and should be separated from the control room by noncombustible construction with a fire resistance rating of 1 hour. Ventilation system openings between the control room and peripheral rooms should have automatic smoke dampers that close on operation of the fire detection or suppression system.

b. Area automatic fire suppression should be provided for underfloor and ceiling spaces if used for cable runs unless all cable is run in 4 in. or smaller steel conduit.

c. There should be no carpeting in the control room.

Differences from the SRP:

a. The shift supervisor's office is constructed as an integral part of the control room and does not require 1 hour separation or dedicated ventilation or suppression features.

b. Aluminum conduit is run under a portion of the raised floor section. Steel conduit, equal to or smaller than 4 inches, is used in the raised floor sections for the operator consoles, which meets the requirements of the BTP.

c. Carpeting may be provided in the control room to enhance operator comfort and reduce fatigue (human factors).

Justification:

a. The shift supervisor's office is constructed of low hazard materials. Its contents are those which would normally be expected to be found in the control room regardless of the addition of the office walls. Since the office is largely constructed of glass and the control room is occupied at all times, fires in the room would be quickly noticed and extinguished using equipment available in the control room.

b. The aluminum conduit is located in a small portion of raised floor which is less than 3 feet in width and exists between the vertical section and benchboard section of the main control board. Since smoke detectors are installed in the vertical board section and the main control room is continuously manned, a fire will be detected in its incipient stages and extinguished.

c. The benefits to control room comfort outweigh the slight potential for igniting the carpet based upon the carpet test results. The carpeting has a critical radiant flux which exceeds the minimum of 0.45 watts per cm2 (ASTM E648) used to define Class 1 interior finishes in accordance with NFPA 101 Life Safety Code.

BVPS-2

Licensing Action #: 20

Licensing Action: Control Room - Deviation in Fire Protection Features - BTP C.7.b

Evaluation:

Section 9.5.1.6, "Fire Protection of Specific Plant Areas," NRC SSER - NUREG-1057, Supplement 5 states:

Control Room"

In Amendment 14 to the FSAR, the applicant identified the following deviations from Section C.7.b of BTP CMEB 9.5-1: (1) 1-hour separation was not provided between the control room and the shift supervisor's office, (2) aluminum conduit rather than steel was run under the raised floor, and (3) carpeting may be provided.

During the site audit, the shift supervisor's office was observed to be a small area in the back of the control room that had been created by installing partial-height unrated walls. The ceiling of the office was observed to be of solid drop-type construction, which would preclude any smoke from reaching the detectors at the ceiling. The addition of a 1-hour rated barrier would not significantly increase the level of fire safety; however, the applicant should either install detection in the office area or replace the ceiling with open lattice-type panels. By letter dated March 5, 1987, in order to resolve this concern, the applicant committed to install a smoke detector in the shift supervisor's office. The staff finds this acceptable.

The use of aluminum conduit in a raised-floor area is limited to a 3-to 4-foot-wide section between the bench board and the vertical boards. Smoke detection is provided in the boards and no combustible material, except conduit, is located in the raised-floor area. Replacing the aluminum conduit with steel would not significantly increase the level of fire protection, and the aluminum conduit is, therefore, acceptable.

Although carpeting has not yet been installed in the control room, the applicant may install it the future. The applicant stated that if carpeting is installed, it will have a flame-spread rating of less than 50 per ASTM E-84 tunnel test and a critical radiant flux that exceeds the minimum of 0.45 watts per square centimeter used to define Class 1 interior finishes. The control room is continuously manned and extinguishers are provided in the immediate areas. Thus, the addition of carpeting of this type in the control room would not significantly reduce the level of fire safety, and is acceptable.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

BVPS-2

Licensing Action #: 20

Licensing Action: Control Room - Deviation in Fire Protection Features - BTP C.7.b

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 21

Licensing Action: Cable Spreading Room - Deviation in Fire Protection Features - BTP C.7.c

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

BVPS-2 "Updated Fire Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, "Cable Spreading Room," Item C.7.c states:

The Standard Review Plan states that:

a. The primary fire suppression in the cable spreading room should be an automatic water system.

b. A 3 feet wide by 8 feet high aisle separation should be provided between tray stacks.

c. Continuous line-type heat detectors should be provided for cable trays.

Differences from the SRP:

a. The primary fire suppression system for the BVPS-2 cable spreading room is an automatic or manual, double capacity, total flooding CO2 system. Hose rack stations and portable fire extinguishers are provided as backup suppression.

b. There are certain aisles in the cable spreading room which are partially blocked by structural members resulting in aisle dimensions which are less than the 3 feet wide by 8 feet high criterion.

c. BVPS-2 has been equipped with alternate means of detecting cable fires.

Justification:

a. The automatic or manual, double-capacity, total flooding CO2 system, in conjunction with the hose rack stations and portable fire extinguishers, provides adequate protection to extinguish fires and ensure the safety of the cable spreading room. Two potential fires are postulated for the cable spreading areas: a short-circuit-induced cable fire and a fire involving transient combustibles. Hazardous quantities of transient combustibles are not expected in these areas for several reasons. First, the areas are not near any major plant traffic route. Second, maintenance and operations in these areas do not involve the use of combustible materials. Third, accessibility to these areas is restricted to personnel performing essential duties. The potential for a cable fire is limited by the use of IEEE 383 for safety related applications or similarly qualified cable for non-safety applications throughout (Refer to Section 8.3.3 for further details). The cable trays are provided with cable tray covers and/or bottoms to confirm with Regulatory Guide 1.75. Fire detection is provided by the early warning fire detection system which provides fire alarms locally and in the control room.

The CO2 system is designed to attain a 50-percent concentration as recommended for cable fires (NFPA-12). Automatic actuation of the CO2 system is provided by the "XL-3" fire detection system which is a "Priority" system with local and control room

alarms. The alarms enable the control room to be aware of the status and availability of the CO2 system at all times. A timed delay is provided in the CO2 initiation cycle to provide for personnel evacuation. CO2 supply capacity is available for a second manual application. CO2 will penetrate to the source of the fire and is less likely to cause damage to electrical equipment. Hose racks are provided at the entrance to the cable spreading room, and all trays can be reached by hose streams.

Penetrations to the control room complex are sealed to prevent leakage of CO2 to occupied spaces. Operating personnel of Unit 1 have had several years of experience with total flooding CO2 systems. All personnel are trained in alarm recognition and evacuation procedures. The systems are generally disarmed only during an outage for major maintenance functions, and a fire watch is posted during the disarmed period. The system is not disarmed during daily operational activities in the area. In the unlikely event of a fire in this area, the fire crew would be required to have breathing apparatus. The cable trays located in this area are utilized largely for instrumentation and control cables. These trays will be provided with flat, unventilated covers and/or bottoms. Power cables are run in rigid conduit. The presence of tray covers inhibits the ability of water to reach potential tray fires. CO2 by virtue of its gaseous state will penetrate into the cable trays and provide fire suppression to the fire in its incipient stage and will prevent a deep-seated fire from occurring. Due to the stack arrangements of the cable trays and the fact that the trays are provided with covers and/or bottoms, a ceiling-mounted automatic water suppression system would not provide adequate assurance that a fire will be extinguished.

Finally, in the unlikely event of a total fire area burnout, BVPS-2 has alternate shutdown capability.

b. The BVPS-2 cable spreading room is accessible to the fire brigade from three remote and separate entrances. Sufficient aisle separation between cable tray stacks is provided for adequate accessibility for fire fighting. Those stations are located at each end of the cable spreading room and at the cable tunnel interface and are capable of providing hose stream coverage to the entire room, thereby enhancing manual fire fighting capability.

c. Refer to the justification provided for Item C.5.e(2).

Evaluation:

Section 9.5.1.6, Fire Protection of Specific Plant Areas, of NRC SSER - NUREG-1057, Supplement 5, states:

Cable Spreading Room:

In the SER, the staff raised concerns regarding the use of automatic C02 in the cable spreading room. As a result, the applicant made certain modifications to ensure that fire brigade members could adequately access all areas of the room. In SSER 3, the staff indicated that this issue would remain as backfit issue 7 pending a

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Licensing Action #: 21

Licensing Action: Cable Spreading Room - Deviation in Fire Protection Features - BTP C.7.c

site visit which would verify that (1) the applicant had implemented the recommendations provided by a human factors expert in a letter dated March 18, 1985, (2) the temporary ramps and platforms needed to facilitate passages had been replaced with permanent versions, and (3) training was provided to the fire brigade. The staff identified a fourth item, the reach of hose streams to the northwest corner, as a deviation and requested the applicant to justify their design. In Amendment 14 to the FSAR, the applicant identified the cable spreading room as a deviation and provided a detailed discussion of the room's fire protection features. During the site audit, the room was reviewed against Items 1, 2, and 3 of SSER 3. The staff noted that issues identified by the human factors expert have been corrected, permanent ramps have been installed to ease accessibility to certain areas, and training procedures were reviewed to ensure that the cable spreading room is specifically addressed. Thus, the issues identified in previous evaluations have been adequately addressed by the applicant, and backfit issue 7 is considered closed. The applicant's deviation request in Amendment 14 to the FSAR was also reviewed and found to adequately resolve previous concerns. Therefore, the existing fire protection for the cable spreading room is an acceptable deviation from Section C.7.c of BTP CMEB 9.5-1.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 22

Licensing Action: Safety-Related Pumps - Lack of 3-Hour Fire Barriers - BTP C.7.k

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

BVPS-2 "Updated Fire Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, "Safety-Related Pumps," Item C.7.k states:

The Standard Review Plan recommends that pump houses and rooms housing redundant safety-related pump trains should be separated from each other and from other areas of the plant by fire barriers having at least 3-hour ratings.

Difference from the SRP:

The fuel pool cooling pumps are not required for safe shutdown following a fire and are protected by means other than 3-hour barriers. (For safety-related pumps and tanks used for safe shutdown, see Item C.5.b - Safe Shutdown Components.)

Justification:

The fuel pool cooling pumps are not required for safe shutdown as a result of fire in any plant area. Fire detection is accomplished by the use of ionization detectors, which have audible alarms locally and audiovisual annunciation in the main control room. Portable extinguishers and hose rack stations are available for fire suppression.

These pumps are located in areas with low combustible loading. Refer to the fire hazards analysis for area FB-1. In the event that both fuel pool cooling pumps are lost, the fuel pool can be cooled with service water through a connection provided for this purpose.

Evaluation:

Section 9.5.1.6, Fire Protection of Specific Plant Areas, of NRC SSER - NUREG-1057, Supplement 5 states:

Safety-Related Pumps:

Section C.7.k of BTP CMEB 9.5-1 states that redundant safety-related pumps should be separated from each other by a 3-hour fire barrier. In Amendment 14 to the FSAR, the applicant stated that the fuel-pool cooling pumps are not separated by a 3-hour barrier. The pumps are located in the fuel building in a fire area with minimal combustibles. Smoke detectors are provided over the pumps, and hose racks are in the immediate area. The fuel-pool cooling pumps are not required for safe shutdown, and loss of the pumps would not affect plant safety. Therefore, the lack of 3-hour separation between the redundant fuel-pool cooling pumps is an acceptable deviation from BTP CMEB 9.5-1, Section C.7.k.

Validation/Conclusions:

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.

BVPS-2

Licensing Action #: 22

Licensing Action: Safety-Related Pumps - Lack of 3-Hour Fire Barriers - BTP C.7.k

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 23

Licensing Action: New Fuel Area - Lack of Detection - BTP C.7.I

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

BVPS-2 "Updated Fire Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, "New Fuel Area," Item C.7.I states:

The Standard Review Plan states that automatic fire detection should alarm and annunciate in the control room and alarm locally.

Difference from the SRP:

Automatic detection in the new fuel storage area is not required.

Justification:

The new fuel storage area is an enclosed cubicle within the fuel building. Combustible loading in the area and the building in general, is extremely low. Administrative controls will be implemented for the new fuel storage area such that the door will be locked and combustible storage in the area will be prohibited. A postulated fire in any area of the fuel building will not impact the ability to safely shut down the plant. Since the fuel building access is controlled, and the building is a low traffic area, potential for accumulation of transient combustibles is negligible. Fire hose stations and portable extinguishers are provided.

Evaluation:

Section 9.5.1.6, Fire Protection of Specific Plant Areas, of NRC SSER - NUREG-1057, Supplement 5 states:

The New Fuel Area, Section C.7.I of BTP CMEB 9.5-1 state that detection should be provided for the new fuel areas. The applicant stated in Amendment 14 to the FSAR that detection is not provided for this area. Combustible loading in this area is negligible. During the site audit of January 27-30, 1987, this area was observed and it was determined that because of limited floor space and controlled personnel access an accumulation of transient combustibles is unlikely. However, the new fuel storage room was observed to have some transient combustibles. By letter dated February 11, 1987, the applicant committed to provide administrative controls on access to this area in order to limit storage of transient combustibles. Therefore, the addition of detection in the new fuel area would not significantly enhance fire safety. With the addition of administrative controls to control combustibles in the new fuel storage room, the lack of detection in the new fuel area is an acceptable deviation from Section C.7.I of BTP CMEB 9.5-1.

Validation/Conclusions:

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.

BVPS-2

Licensing Action #: 23

Licensing Action: New Fuel Area - Lack of Detection - BTP C.7.I

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 24

Licensing Action: Spent Fuel Pool Area - Lack of Detection - BTP C.7.m

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

BVPS-2 "Updated Fire Safety Analysis Report," (BVPS-2 UFSAR), in Section 9.5A.2, "Spent Fuel Pool Area," Item C.7.m states:

The Standard Review Plan states that automatic fire detection should alarm and annunciate in the control room and alarm locally.

Difference from the SRP:

Automatic detection in the spent fuel pool area is not required.

Justification:

The spent fuel pool area is void of any concentration of combustibles which could pose a threat to the building or, more importantly, plant safety in general. A postulated fire in any area of the fuel building will not impact the ability to safely shut down the plant. Since the fuel building access is controlled, and the building is a low traffic area, potential for accumulation of transient combustibles is negligible. The fuel pool cooling pumps are provided with detection coverage by ionization detectors which alarm locally and in the control room. Fire hose stations and portable extinguishers are provided.

Evaluation:

Section 9.5.1.6, Fire Protection of Specific Plant Areas, of NRC SSER - NUREG-1057, Supplement 5 states:

New Fuel Area and Spent Fuel Pool Area:

Sections C.7.k and C.7.m of BTP CMEB 9.5-1 state that detection should be provided for the new fuel and spent fuel pool areas. The applicant stated in Amendment 14 to the FSAR that detection is not provided for these areas. Combustible loading in these areas is negligible and detection is provided for the fuel-pool cooling pumps. During the site audit of January 27-30, 1987, this area was observed and it was determined that because of limited floor space and controlled personnel access an accumulation of transient combustibles is unlikely. However, the new fuel storage room was observed to have some transient combustibles. By letter dated February 11, 1987, the applicant committed to provide administrative controls on access to this area in order to limit storage of transient combustibles. Therefore, the addition of detection in the new and spent-fuel pool areas would not significantly enhance fire safety. With the addition of administrative controls to control combustibles in the new fuel storage room, the lack of detection in the new and spent-fuel areas is an acceptable deviation from Section C.7.m of BTP CMEB 9.5-1.

BVPS-2

Licensing Action #: 24

Licensing Action: Spent Fuel Pool Area - Lack of Detection - BTP C.7.m

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 25

Licensing Action: Radwaste and Decontamination Areas - Lack of Fire Suppression and Detection - BTP C.7.n

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: No

Basis:

BVPS-2 "Updated Fire Safety Analysis Report," (BVPS-2 UFSAR), Section 9.5A.2, "Radwaste and Decontamination Areas," Item C.7.n states:

The Standard Review Plan states that automatic fire suppression and detection should be provided.

Difference from the SRP:

Radwaste and decontamination areas are provided with partial suppression and/or detection to the extent necessary considering the fire hazards in the area. This may include automatic suppression or detection for specific hazards only.

Justification:

Radwaste and decontamination areas are considered to be the waste handling building (WH-1), the condensate polishing building (CP-1), and the decontamination building (FB-1).

The condensate polishing building area (CP-1) is largely free of combustibles which could be considered significant hazards. For areas such as the resin storage area, and the primary chemistry lab, where concentrations of combustibles occur, automatic water suppression with control room indication is provided. Local alarms are also provided.

The decontamination building is void of any concentration of combustibles which could pose a threat to the building, or more importantly, plant safety in general. Automatic detection and suppression are not necessary.

The waste handling area (WH-1) is essentially free of combustibles which could be considered significant hazards. For the radwaste baler area where concentrations of combustibles occur, automatic water suppression with control room indication is provided. Local alarms are also provided.

All of these buildings are separated from other structures by 3-hour fire barriers and contain no equipment used for safe shutdown of the plant. Manual hose stations and portable extinguishers are provided throughout the buildings.

Evaluation:

NRC SSER - NUREG-1057, Supplement 5 states:

Section 9.5.1.6 Fire Protection of Specific Plant Areas

Radwaste and Decontamination Area:

The applicant stated in Amendment 14 to the FSAR that the radwaste and decontamination areas deviate from C.7.n of BTP CMEB 9.5-1 because they are not provided with detection and suppression throughout. These areas include the waste

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Licensing Action #: 25

Licensing Action: Radwaste and Decontamination Areas - Lack of Fire Suppression and Detection - BTP C.7.n

handling building (WH-1), condensate polishing building (CP-1), and the decontamination building (FP-1). The majority of these areas are essentially free of combustibles; however, the applicant has provided automatic suppression where there is a possibility of the accumulation of transient combustibles.

These areas include the resin storage area, the primary chemistry lab, and the radwaste baler area. A suppression system is also provided for the charcoal filter unit in the decontamination building. Hose racks are provided throughout the area. No equipment or circuitry required for safe shutdown is located in these areas. The addition of general area detection and suppression would not significantly increase the level of plant fire safety. Therefore, the lack of area detection and suppression for the radwaste and decontamination areas is an acceptable deviation from C.7.m of BTP CMEB 9.5-1.

Validation/Conclusions:

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.

Disposition:

Not being transitioned

References:

- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."

Associations:

None

BVPS-2

Licensing Action #: 26

Licensing Action: Fire Detection System Secondary Power Supplies - Use of Plant Emergency Power Supply - BTP C.6.a(6)

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: Yes

Basis:

The "Standard Review Plan" (SRP) in the Branch Technical Position of the Chemical Engineering Branch (BTP CMEB) 9.5-1, Section C.6.a (6), "Fire Detection," states:

Primary and secondary power supplies should be provided for the fire detection system and for electrically operated control valves for automatic suppression systems. Such primary and secondary power supplies should satisfy provisions of Section 2220 of NFPA 72D. This can be accomplished by using normal offsite power as the primary supply with a 4-hour battery supply as secondary supply; and by providing capability for manual connection to the Class IE emergency power bus within 4 hours of loss of offsite power. Such connection should follow the applicable guidelines in Regulatory Guides 1.6, 1.32, and 1.75.

The May 23, 1984 SER, "Beaver Valley Power Station - Unit No. 2 Fire Protection - Draft Safety Evaluation Report," item FP-9 states:

Fire Detection

The licensee has not provided information on whether they meet Section 2220 of NFPA Std. 72D. We will require the applicant to verify that reliable power supplies, as recommended by Section C.6.b of BTP CMEB 9.5-1, will be provided. This can be accomplished by using normal offsite power as the primary supply with a 4-hour battery supply as secondary supply, and by providing capability for manual connection to the Class 1E emergency power bus within 4 hours of loss of offsite power. Such connection should follow the applicable guidelines in Regulatory Guides 1.6, 1.32, and 1.75.

Response:

BVPS-2 meets the intent of Section 2220 of NFPA Standard 72D in the following manner:

The primary supply for the early warning fire detection system and the independent fire detection and suppression systems is the normal offsite power supply system.

The secondary supply for the fire detection systems is the ERF nonsafety diesel generator. The switchover capability is an automatic function. The ERF diesel generator supplies the 120-V ac uninterruptible power supply system required for the early warning detection system and the 125-V dc panels for the fire detection and suppression systems.

A battery backup system with a 2-hour rated capability is provided as a backup for the 125-V dc systems.

A battery backup system with a 30-minute capability is provided as a backup to the 120-V ac systems. This is to provide electrical power continuity for the 10 seconds

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Licensing Action #: 26

Licensing Action: Fire Detection System Secondary Power Supplies - Use of Plant Emergency Power Supply - BTP C.6.a(6)

required to start the ERF diesel and achieve rated voltage and frequency. See attached Figure FP-9.

The central processing unit for the early warning fire detection system, which is shared by both BVPS-2 and BVPS-1, is powered by BVPS-1 and has the capability of being supplied from either normal station power or a BVPS-1 Class 1E safety related diesel generator.

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

FPE RAI 16

Evaluation:

NRC SER - NUREG-1057, Section 9.5.1.5, "Fire Detection and Suppression," states:

Fire Detection

A fire detection system is provided for all areas containing safety-related equipment and for all areas that present a fire exposure to safety-related equipment.

The system complies with NFPA 72D for a Class A system, with detectors installed in accordance with NFPA 72E.

By letter dated May 23, 1984, the applicant committed to provide a reliable power supply for the fire detection system as follows:

(1) The primary supply for the fire detection system and suppression systems is the normal offsite power supply system.

(2) The secondary supply for the fire detection systems is a non-safety diesel generator. 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.

(3) A battery backup system with a 2-hour rated capability is provided as a backup to the 125-V dc systems.

A battery backup system with a 30-minute capability is provided as a backup to the 120-V ac systems. This is to provide electrical power continuity for the 10 seconds required to start the diesel and achieve rated voltage and frequency. The staff finds this an acceptable primary and secondary source of power.

On the basis of its evaluation, the staff concludes that the fire detection system will meet Section C.6.a of BTP CMEB 9.5-1 and is, therefore, acceptable.

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The deviation for the Fire Detection System Secondary Power Supplies - Use of Plant Emergency Power Supply is being transitioned to the new licensing basis per NFPA 805.

BVPS-2

Licensing Action #: 26

Licensing Action: Fire Detection System Secondary Power Supplies - Use of Plant Emergency Power Supply - BTP C.6.a(6)

Disposition:

Licensing Action acceptable for transition

References:

- 10080-E-037, Revision 8, Addendum 2, "Battery Duty Cycle and Size Calculation."
- 1OM-33.3.C, Revision 13, "Power Supply and Control Switch List."
- 84-05-23, "BVPS-2 Fire Protection - Draft SER."
- 3SQS-33.1, Revision 2, "Fire Protection System - Student Handout."
- BVS-0564, Revision 0, "Specification for Fire Detection System."
- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."

Associations:

Ch.3 - Section: 3.8 / Subsection: 3.8.1

BVPS-2

Licensing Action #: 27

Licensing Action: Cable Construction - Lack of Compliance with IEEE-383-1974 Flame Test

Basis Date: October 1985 (NUREG-1057), and May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: ~~Yes~~ No

FPE RAI 04(a)(b)(c)

Basis:

NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, Ch. 3.3.5.3, states:

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

Exception: Existing cable in place prior to the adoption of this standard shall be permitted to remain as is.

BVPS-2 "Updated Fire Safety Analysis Report" (BVPS-2 UFSAR), Section 8.3.3, states:

Specifications of electrical cables include flame-retardant requirements, low gas generation during combustion, and the ability to operate in a wet environment. All cables installed in trays at BVPS-2, either:

1. have passed the vertical cable tray gas burner flame test delineated in Section 2.5.4.4 of IEEE-383-1974 or,

2. additionally, the flame testing for cables specified after January 1978 was modified in accordance with Reg. Guide 1.131-77 or,

3. for non-safety applications, are flame retardant and have passed equivalent industry flame testing as approved by engineering evaluation.

Evaluation:

The NRC SER NUREG-1057, Section 9.5.1.4, states:

Cable trays are of all-metal construction. Electrical cable construction passes the Institute of Electrical and Electronics Engineers (IEEE) 383-1974 flame test.

The NRC SSER NUREG-1057, Supplement 5, Section 17.5.4.2, "Technical Assessments," states:

Action Item E-04 involved power cables delivered before May 1984 which do not meet the requirements of FSAR Section 8.3.3. This section of the FSAR addresses the flame testing requirements of Regulatory Guide (RG) 1.131 which supplement the requirements of IEEE Standard 383-1974. During the FSAR revision process, exception to these requirements for the subject cables was not taken. As a result, the applicant has issued Licensing Change Notice 1615, dated October 20, 1986, clarifying the actual extent of compliance with RG 1.131. The FSAR change has to be resolved between the staff and the applicant as a part of the normal licensing process. For the purpose of the design verification, this item is closed.

BVPS-2

Licensing Action #: 27

Licensing Action: Cable Construction - Lack of Compliance with IEEE-383-1974 Flame Test

Validation/Conclusions:

~~The bases for previous acceptance remain valid as described in the applicable sections above.~~ The deviation for the lack of compliance with IEEE-383-1974 flame test for cable construction ~~is being transitioned to the new licensing basis per NFPA 805~~ was evaluated under EEEE; therefore, this licensing action is no longer necessary.

FPE RAI 04(a)(b)(c)

Disposition:

~~Licensing Action acceptable for transition~~

FPE RAI 04(a)(b)(c)

Not being transitioned

References:

- NFPA 805, Revision 2001, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants."
- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- NUREG/CR-7010, Revision 1, "Cable Heat Release, Ignition, and Spread in Tray Installations During Fire (CHRISTIFIRE) - Phase 1: Horizontal Trays."
- NUREG/CR-7150, Revision 1, "Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE) - Phenomena Identification and Ranking Table (PIRT) Exercise for Nuclear Power Plant Fire-Induced Electrical Circuit Failure."
- TER-13568, Revision 0, "IEEE-383-74 Cable Flame Test Comparative Analysis."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

~~Ch.3 - Section: 3.3 / Subsection: 3.3.5.3~~

FPE RAI 04(a)(b)(c)

None

BVPS-2

Licensing Action #: 28

Licensing Action: Bulk Storage of Flammable Liquids - Deviation from NFPA 30 Requirements - BTP C.7.i

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: No

Basis:

BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), "Fire Area DG-1 - Diesel Generator Cubicle (Orange)" states:

The primary fire suppression system for this area is an automatic or manual, double capacity, total flooding, CO2 system. Hose rack stations and portable fire extinguishers provide backup. Fire detection is provided by the early warning fire detection system which provides fire alarms locally and in the control room.

The CO2 system is designed to attain a 34-percent concentration as recommended for surface fires (oil fires) by NFPA-12. Automatic actuation of the CO2 system is provided by heat detectors with local and control room alarms. The alarms enable the control room to be aware of the status and availability of the CO2 system at all times.

A set of heat detectors with temperature settings below the heat detectors used to actuate the CO2 system have been provided to shut down the ventilation system before CO2 is discharged.

The floor drain system for the diesel generator cubicles is routed to an oil separator before being discharged to the storm sewer system, thus precluding the possibilities of spreading fires to any other plant area.

The fuel oil day tanks are provided with a curb to prevent the fuel oil from spreading throughout the cubicles area.

The postulated fire for this fire area is a break in a diesel fuel oil line with the diesel running which causes ignition of the fuel oil. The CO2 system along with the fire barrier separating the two fire areas would limit the fire to only one fire area; therefore, the remaining diesel would be available.

The diesel fuel oil storage tanks are located beneath the diesel building; one under each diesel room. The tanks are separated from the diesel building by a minimum of 3 feet of reinforced concrete. The only access to the tanks is a manhole for each tank, located in the diesel room vestibules. Based on the location of the tanks, no special protection has been provided for the tanks.

A fire in this area will be controlled and extinguished within the area.

BVPS-2 UFSAR, "Fire Area DG-2 - Diesel Generator Cubicle (Purple)" states:

The primary fire suppression system for this area is an automatic or manual, double capacity, total flooding, CO2 system. Hose rack stations and portable fire extinguishers provide backup. Fire detection is provided by the early warning fire detection system which provides fire alarm locally and in the control room.

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Licensing Action #: 28

Licensing Action: Bulk Storage of Flammable Liquids - Deviation from NFPA 30 Requirements - BTP C.7.i

The CO2 system is designed to attain a 34-percent concentration as recommended for surface fires (oil fire) by NFPA-12. Automatic actuation of the CO2 system is provided by heat detectors with local and control room alarms. The alarms enable the control room to be aware of the status and availability of the CO2 system at all times.

A set of heat detectors with temperature settings below the heat detectors used to actuate the CO2 system have been provided to shut down the ventilation system before CO2 is discharged.

The floor drain system for the diesel generator cubicles is routed to an oil separator before being discharged to the storm sewer system, thus precluding the possibilities of spreading fires to any other plant area.

The fuel oil day tanks are provided with a curb to prevent the fuel oil from spreading throughout the cubicles area.

The postulated fire for this fire area is a break in a diesel fuel oil line with the diesel running which causes ignition of the fuel oil. The CO2 system along with the fire barrier separating the two fire areas would limit the fire to only one fire area; therefore, the remaining diesel would be available.

The diesel fuel oil storage tanks are located beneath the diesel building; one under each diesel room. The tanks are separated from the diesel building by a minimum of 3 feet of reinforced concrete. The only access to the tanks is a manhole for each tank, located in the diesel room vestibules. Based on the location of the tanks, no special protection has been provided for the tanks.

A fire in this area will be controlled and extinguished within the area.

Evaluation:

NRC SER - NUREG-1057, Section 9.5.1.4, "Control of Combustibles," states:

Safety-related systems have been isolated or separated from combustible materials as much as possible. The storage of flammable liquids complies with National Fire Protection Standard 30 (NFPA 30).

Section 9.5.1.6, "Emergency Diesel Generator Rooms," states:

The emergency diesel generators are in individual rooms separated from each other and from other areas of the plant by fire barriers having a fire rating of 3 hours.

The primary fire suppression systems for these cubicles are individual, automatic, total flooding carbon dioxide systems. Ultraviolet flame detectors and portable carbon dioxide fire extinguishers are located in each room. Manual fire hose stations are located at the entrance to each room as a backup to the carbon dioxide system.

Each diesel generator cubicle has a floor-mounted, 1100-gallon fuel oil day tank within a curbed area. An oil sump pit with a drain is provided within the curbed area

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Licensing Action #: 28

Licensing Action: Bulk Storage of Flammable Liquids - Deviation from NFPA 30 Requirements - BTP C.7.i

and is connected to an underground oil separator. The curbed volume is sufficient to contain 1100 gallons.

On the basis of this review, the staff concludes that the protection provided for the diesel generator rooms meets Section C.7.i of BTP CMEB 9.5-1, and is, therefore, acceptable.

Validation/Conclusions:

The diesels and their day tanks were constructed consistent with NFPA 30; therefore, this licensing action is no longer necessary.

Disposition:

Not being transitioned

References:

- 10080-B-085, Revision 14, "Fire Hazard Analysis."
- 10080-RB-0003B, Revision 10, "Fire Protection Arrangement 718' to 735'."
- 10080-RB-0090B, Revision 21, "Flow Diagram - CO2 Fire Protection & Smoke Detection System - Sheet 2."
- 10080-RB-0094A, Revision 6, "CO2 Fire Protection System, Service & Diesel Generator Building."
- 10080-RM-0013A, Revision 8, "Arrangement Diesel Generator Building."
- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.3 - Section: 3.3 / Subsection: 3.3.8
Ch.4 - Compartment: 2-DG-1
Ch.4 - Compartment: 2-DG-2

BVPS-2

Licensing Action #: 29

Licensing Action: Standpipe and Hose Systems - Class II versus Class III Requirement - BTP C.6.c

Basis Date: October 1985 (NUREG-1057)

To Be Transitioned?: Yes

Basis:

NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," Chapter 3.6.1, states:

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.

The BVPS-2 "Updated Final Safety Analysis Report," BVPS-2 UFSAR, Section 9.5.1.7.3, states that:

Compliance with hose rack spacing is met. The hose stations are designed for flow of at least 100 gpm through a 1.5" hose. The system is more similar to a Class II type standpipe and hose system in that it has 1.5"-size hose valves only, and does not have 2.5"-size hose valves as required for Class III systems.

Evaluation:

The SER NUREG-1057, Section 9.5.1.5 states:

The wet pipe sprinkler systems, deluge systems, and pre-action systems meet the provisions of NFPA 13 and NFPA 15. The areas equipped with water suppression systems are listed in Table 1 of the applicant's fire protection evaluation report.

Each automatic sprinkler system and interior hose standpipe is supplied through separate connections from the yard main or from the internal cross-connections through buildings to ensure that no single failure in the water supply system will impair both the primary and backup fire protection in building areas.

Each sprinkler and standpipe system connection to the distribution system is equipped with an indicating gate valve so that groups of sprinkler systems and/or manual hose stations can be isolated without interrupting the supply to other sprinkler systems and manual hose stations connected to the same header.

On the basis of its evaluation, the staff finds that sprinkler and standpipe systems have been provided in accordance with Section C.6.c of BTP CMEB 9.5-1, and are, therefore, acceptable.

Manual hose stations are located throughout the plant in accordance with NFPA 14. Standpipe system piping for hose stations protecting safe shutdown equipment has been analyzed for SSE loading and is provided with seismic supports. The staff concludes that the design of the standpipe system piping meets Section C.6.c of BTP CMEB-9.5-1, and is, therefore, acceptable.

BVPS-2

Licensing Action #: 29

Licensing Action: Standpipe and Hose Systems - Class II versus Class III Requirement - BTP C.6.c

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The deviation for the standpipe and hose system Class III is being transitioned to the new licensing basis per NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 10080-RB-0003A, Revision 12, "Fire Protection Arrangement."
- 10080-RB-0003B, Revision 10, "Fire Protection Arrangement 718' to 735'."
- 10080-RB-0003C, Revision 6, "Fire Protection Arrangement 735' to 760'."
- 10080-RB-0003D, Revision 7, "Fire Protection Arrangement 760' to 794'."
- 10080-RB-0003E, Revision 5, "Fire Protection Arrangement 735' to 752'."
- 10080-RB-0043B, Revision 12, "Fire Protection - Auxiliary Building."
- 10080-RB-0091A, Sheet 1, Revision 27, "Flow Diagram Fire Protection."
- 10080-RB-0091B, Sheet 2, Revision 13, "Flow Diagram Fire Protection."
- 10080-RB-0091C, Sheet 3, Revision 17, "Flow Diagram Fire Protection."
- 10080-RB-0091D, Sheet 4, Revision 21, "Flow Diagram Domestic Water System."
- 10080-RB-0091E, Sheet 5, Revision 8, "Flow Diagram Domestic Water System."
- 10080-RB-0091F, Sheet 6, Revision 5, "Flow Diagram Domestic Water System."
- 10080-RB-0091G, Sheet 7, Revision 18, "Flow Diagram Fire Protection."
- 10080-RB-0091H, Sht. 8, Revision 9, "Flow Diagram Fire Protection."
- 10080-RM-0433-001A, Revision 21, "Valve Operation Number Diagram - Fire Protection Water Distribution Network."
- 10080-RM-0433-001B, Revision 8, "Valve Operation Number Diagram - Fire Protection Water - Miscellaneous Buildings."
- 10080-RM-0433-001C, Revision 19, "Valve Operation Number Diagram Fire Protection Water - Auxiliary Building."
- 10080-RM-0433-001D, Revision 12, "Valve Operation Number Diagram Fire Protection Water Containment Building."
- 10080-TLD-033C-010-02, Revision 4, "Test Loop Diagram Fire Protection Water - Service Building Fire Hose Racks Flow."

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Licensing Action #: 29

Licensing Action: Standpipe and Hose Systems - Class II versus Class III Requirement - BTP C.6.c

- 10080-TLD-033C-028-02, Revision 3, "Test Loop Diagram Fire Protection Water - Control Building Fire Hose Racks Flow."
- 211-B-041A, Revision 0, "Auxiliary Building Fire Protection Sizing Piping for Hose Racks."
- 2BVS-0173, Revision final, "Sprinkler and Water Spray Fire Protection."
- 2BVS-0914, Revision 4, "Specification for Interior Fire Protection System."
- 2DBD-M-004, Revision 2, "Design Basis Document for Piping, Tubing and Duct Supports."
- 2OM-33.1.E, Revision 10, "Specific Instrument and Control."
- 2OST-33.1, Revision 20, "Fire Protection System Monthly Inspection."
- ES-G-001, Revision 3, "Seismic Classification for BVPS-2 Structures, Systems and Components."
- NFPA 14, Revision 1974, "Standard for the Installation of Standpipe and Hose Systems."
- NFPA 805, Revision 2001, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants."
- NUREG-1057, "NRC SER - NUREG-1057 dated October 1985."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.3 - Section: 3.6 / Subsection: 3.6.1

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Licensing Action #: 30

Licensing Action: Intake Structure - Detection and 3-Hour Barriers versus Sprinklers - BTP C.6.c

Basis Date: June 6, 1979 BVPS-1 SER

To Be Transitioned?: Yes

Basis:

The BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), states:

9.5A.1.3.19 FIRE AREA IS-2 - INTAKE STRUCTURE

9.5A.1.3.19.1 Fire Area Description

*Fire Area IS-2 contains the 'swing' service water pump (2SWS*P21C). The barriers that comprise the perimeter of this area consist of reinforced concrete walls and slabs with a minimum thickness of 18 inches. All door openings between other cubicles have 3-hour fire-rated doors. All penetrations of intercompartment walls are sealed with a material having a rating equivalent to the fire barrier. This area contains equipment for both BVPS-1 and BVPS-2.*

A 12-inch-wide slot exists in the ceiling of this cubicle for the ventilation system. This slot will not allow a fire to spread to other areas. There are no ventilation penetrations between IS-2 and adjacent areas.

No components or cables located in this area are required for plant shutdown.

9.5A.1.3.19.2 Methods of Suppression/Detection

Early warning detection and control room alarm is provided by BVPS-1 for IS-2. Hose racks and portable fire extinguishers are provided outside the cubicles. Fire suppression by water can also be gained by utilizing the outside hose headers test connections.

The postulated fire for IS-2 is a fire in the service water pump. Based on the existing fire loading, fire detection which alarms in the common control room, manual hose stations and 3-hour fire-rated walls, the fire would be contained within the cubicle.

9.5A.1.3.19.3 Safe Shutdown Summary

Plant shutdown can be achieved with either orange or purple power components from the main control room.

The BVPS-2 UFSAR also states:

9.5A.1.3.20 FIRE AREA IS-3 - INTAKE STRUCTURE

9.5A.1.3.20.1 Fire Area Description

This area contains the Train B service water pump. The area is comprised of reinforced concrete walls and a floor slab with a minimum thickness of 18 inches. All doors leading to adjacent areas have a 3-hour fire rating. This area contains equipment for both BVPS-1 and BVPS-2.

A 12-inch wide slot exists in the ceiling of this pump cubicle for the ventilation system. This slot will not allow a fire in one cubicle to propagate to another. All

penetrations of intercompartment walls are sealed with a material having a rating equivalent to the fire barrier. There are no ventilation penetrations between IS-3 and adjacent cubicles.

The shutdown components located in fire area IS-3 are listed in the Fire Protection Safe Shutdown Report.

Power and control cables enter this area from duct lines. All Class 1E and non-Class 1E circuits within this area are routed in conduit.

The two emergency MCCs are fed from separate emergency 480 V substations and enter the cubicles from a duct line.

Cables associated with safe shutdown located in this fire area have been identified and evaluated.

9.5A.1.3.20.2 Methods of Suppression/Detection

Early warning detection and control room alarm is provided by BVPS-1 for IS-3. Hose racks and portable fire extinguishers are provided outside the cubicles. Fire suppression by water can also be gained by utilizing the outside hose headers test connections.

The postulated fire for IS-3 is a fire in the service water pump. Based on the existing fire loading, fire detection which alarms in the common control room, manual hose stations, and 3-hour fire-rated walls, the fire would be contained within the cubicle. As a result of redundancy and separation, a loss of availability of one service water pump would not affect the ability to achieve safe shutdown. Availability of the alternate intake structure, which provides total redundancy for BVPS-2 service water pumps in an isolated structure approximately 1,800 feet upstream, provides the capability to achieve safe shutdown on loss of this entire structure.

9.5A.1.3.20.3 Safe Shutdown Summary

Fire Area IS-3 contains the Train B service water pump. This pump is assumed lost and subsequently renders the purple emergency diesel generator unavailable. The purple train (in addition to white and yellow channel-related shutdown equipment) is assumed lost during a fire in this area. Orange train equipment is utilized to achieve shutdown from the main control room, supplemented by manual operator actions.

BVPS-2 UFSAR further states:

9.5A.1.3.21 FIRE AREA IS-4 - INTAKE STRUCTURE

9.5A.1.3.21.1 Fire Area Description

This area contains the Train A service water pump. The area is comprised of reinforced concrete walls and a floor slab with a minimum thickness of 18 inches. All doors leading to adjacent areas have a 3-hour fire rating. This area contains equipment for both BVPS-1 and BVPS-2.

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A 12-inch-wide slot exists in the ceiling of this pump cubicle for the ventilation system. This slot will not allow a fire in one cubicle to spread to another. All penetrations of intercompartment walls are sealed with a material having a rating equivalent to the fire barrier. There are no ventilation penetrations between IS-4 and adjacent areas.

The shutdown components located in fire area IS-4 are listed in the Fire Protection Safe Shutdown Report.

Power and control cables enter this area from duct lines. All Class 1E and non-Class 1E circuits within this area are routed in conduit.

The two emergency MCCs are fed from separate emergency 480 V substations and enter the cubicles from a duct line.

Cables associated with safe shutdown located in this fire area have been identified and evaluated.

9.5A.1.3.21.2 Methods of Suppression/Detection

Detection and control room alarm is provided by BVPS-1 for IS-4. Hose racks and portable fire extinguishers are provided outside the cubicles. Fire suppression by water can also be gained by utilizing the outside hose headers test connections that are normally used for fire pump performance testing and system flushing.

The postulated fire in IS-4 occurs in the fire pump, fuel oil tank which also disables the diesel-driven fire pump. The motor-driven fire pump is located in IS-1 which is over 40 feet away and separated from IS-4 by IS-2 and IS-3. A fire in IS-4 would not impair the operation of the motor-driven fire pump and, therefore, manual hose station would be available and the fire limited to IS-4. As a result of the redundancy and separation, a loss of availability of one service water pump would not affect the ability to achieve safe shutdown. Availability of the alternate intake structure, which provides total redundancy for BVPS-2 service water pumps in an isolated structure approximately 1,800 feet upstream, provides the capability to achieve safe shutdown on the loss of this entire structure.

A fire in this area will be controlled and extinguished within the area.

9.5A.1.3.21.3 Safe Shutdown Summary

Fire Area IS-4 contains the Train A service water pump. This pump is assumed lost and subsequently renders the orange emergency diesel generator unavailable. The orange train (in addition to red and blue channel-related shutdown equipment) is assumed lost during a fire in this area. Purple train equipment is utilized to achieve shutdown from the main control room, supplemented by manual operator actions.

NOTE: Among the conditions cited in the NRC SER dated June 6, 1979, that requires clarification is lack of sprinklers in the Intake Structure for the diesel fire pump area (Cubicle IS-4). The NRC approved this configuration in the Intake Structure, however, diesel fire

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pumps are required per Appendix A to BTP-CMEB 9.5-1 and NFPA 805 Section 3.9.4 to have automatic sprinklers installed.

~~Approval of clarifications relative to this exemption is being requested as part of this LAR submittal and transition to NFPA 805 (See Attachment T "Clarification of Prior NRC Approvals").~~

FPE RAI 05(a)(viii) and SSD RAI 13(d)

Evaluation:

The June 6, 1979 BVPS-1 SER, "Safety Evaluation by the Office on NRR Related to Amendment No. 18," Section 5.13.3, "Consequences if No Fire Suppression," states:

An unmitigated fire in the intake structure would not result in compromising safe shutdown capability because of the separation and barriers between redundant safety-related equipment. The river water pumps are located in separate compartments and cabling is in conduit. A separate alternate water intake structure with redundant river water pumps is provided 1800 feet away.

Because of the curbing at the diesel day tank and the trench to the diesel engine, a leak from the tank or supply lines would not spread to other areas.

5.13-4 Fire Protection System

Manual hose stations and portable extinguishers are provided within the building for manual firefighting. Thermal type fire detectors which alarm in the control room are provided in the compartments housing the river water pumps and the compartment housing the diesel fire pump.

Separation between pump compartments is provided by 18" thick reinforced concrete walls with 3 hour fire rated doors.

5.13.5 Adequacy of Fire Protection

Because of the redundancy of the safety-related equipment and separation between cables and components, the provisions of manual firefighting equipment are adequate. The significant quantities of unnecessary combustibles observed in this area, however, jeopardizes this capability.

A fire originating in one of the safety-related pump compartments, (IS-1 through IS-3), would go undetected for some time and result in the loss of one of these units.

5.13-6 Modification

The licensee will remove all unnecessary combustibles from the intake structure and will allow only fire retardant treated lumber to be used within the building. The licensee will also provide automatic fire detectors in the safety-related pump compartments IS-1, IS-2 and IS-3 arranged to alarm in the control room.

We find that, upon implementation of the above described modifications, the Intake Structure fire protection satisfies the objectives identified in Section 2.2 of this report and is, therefore, acceptable.

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In a letter from Duquesne Light Company to the NRC dated October 27, 1976, a response to Branch Technical Position (BTP) 9.5.1 Position IV C .2.c states: FPE RAI 05(a)(viii)

The source of water for fire protection is the Ohio River. Heated fire pump rooms are located in the Intake Structure... The pumps are located in separate seismic Class I cubicles with walls in excess of three hour fire rating.

The presence of the fire pumps located in the intake structure was reiterated in the BVPS-2 NUREG 1057, "Safety Evaluation Report related to the operation of Beaver Valley Power Station," Unit No.2, Docket No. 50-412, dated May 1987, Section 9.5.1.5 that states in part:

The fire pumps are located in the intake structure and are separated by 3-hour fire-rated barriers.

Based on the above, the fire detection systems are installed and are credited for transitioning as listed in LAR Table 4-3 and in LAR Attachment A2, Section 3.8.2 records for compartments 3-IS-1, 3-IS-2, and 3-IS-3.

In addition, the requirement in NFPA 805, Section 3.9.4 for suppression over an engine driven fire pump is a new requirement and is not a requirement of construction prior to the issuance of Appendix A to BTP APCSB 9.5-1 or a requirement in the BVPS 1970 NFPA 20, "Centrifugal Fire Pumps," code of record.

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The deviation for detection and 3-hour barriers in lieu of sprinklers in the intake structure is being transitioned to the new licensing basis under NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 10080-RB-0002A, Sheet 1, Revision 13, "Yard Piping Underground."
- 10080-RB-0002C, Sheet 3, Revision 6, "Yard Piping Underground."
- 1OST-33.16C, Revision 1, "Early Warning Smoke Detection Instrument Test Main Intake Structure."
- 1OST-33.2A, Revision 5, "Fire Protection System Monthly Hose Stations Test."
- 1PFP-INTS-705-Pump Cubicles, Revision 1, "Fire Areas IS-1, 2, 3, 4."
- 2OST-33.1, Revision 20, "Fire Protection System Monthly Inspection."
- 2OST-33.2B, Revision 12, "Fire Protection Hose Stations Inspection, Flush, & Hose Replacement."
- 76-10-27, "Compliance with APCSB9.5-1." FPE RAI 05(a)(viii)

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Licensing Action: Intake Structure - Detection and 3-Hour Barriers versus Sprinklers - BTP C.6.c

- 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, Revision 12, "Fire Hazards Analysis."
- 8700-RB-0002S, Sheet 2, Revision 6, "General Arrangement Fire Protection System."
- 8700-RB-0002V, Sheet 5, Revision 4, "General Arrangement Fire Protection."
- 8700-RM-0059E, Sheet 1, Revision 13, "Arrangement Intake Structure."
- 8700-RM-0059F, Sheet 2, Revision 10, "Arrangement Intake Structure."
- FPSSR, Addendum 37, "BVPS-2 Fire Protection Safe Shutdown Report."
- NUREG-1057, Supplement No. 5, May 1987, "Safety Evaluation Report Related to the Operation of Beaver Valley Power Station, Unit 2." FPE RAI 05(a)(viii)
- UFPARR, Revision 30, "Updated Fire Protection Appendix R Review."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.3 - Section: 3.9 / Subsection: 3.9.4
Ch.4 - Compartment: 3-IS-1
Ch.4 - Compartment: 3-IS-2
Ch.4 - Compartment: 3-IS-3
Ch.4 - Compartment: 3-IS-4
~~Fire Protection - Fire Compartment: 3-IS-1 / Form: Detection~~ FPE RAI 05(a)(viii)
Fire Protection - Fire Compartment: 3-IS-2 / Form: Detection
Fire Protection - Fire Compartment: 3-IS-3 / Form: Detection
Fire Protection - Fire Compartment: 3-IS-4 / Form: Detection

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Licensing Action: Access Hatch - Unrated Containment Hatch - BTP C.5.a(5)

Basis Date: May 1987 (NUREG-1057, Supplement 5)

To Be Transitioned?: Yes

Basis:

NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, Section 3.11.3, "Fire Barrier Penetrations," states:

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

BVPS-2 "Updated Final Safety Analysis Report" (BVPS-2 UFSAR), states:

The Standard Review Plan states that door openings in fire barriers should be protected with equivalently rated doors, frames, and hardware that have been tested and approved by a nationally recognized laboratory. Such doors should be self-closing or provided with closing mechanisms and should be inspected semiannually to verify that automatic hold-open, release, and closing mechanisms and latches are operable. (See NFPA 80, 'Fire Doors and Windows.')

Areas protected by automatic total flooding gas suppression systems should have electrically supervised self-closing fire doors or fire doors should be kept closed and electrically supervised at a continuously manned location.

The BVPS-2 UFSAR, in "Differences from the SRP," states:

c. Special purpose-type door assemblies (containment access doors/hatches) are not UL rated.

It continues on under "Justifications" to state:

c. These containment area special purpose-type door assemblies are capable of providing adequate fire protection for the area. The doors provide a pressure boundary and no UL fire-rated doors for these purposes are available.

Evaluation:

The NRC SSER - NUREG-1057, Supplement 5, Section 9.5.1.4, "General Plant Guidelines," states:

During the audit, the applicant also stated that the containment access hatch did not contain a UL label or certification of fire testing. The hatch was observed to be similar to air locks used at other facilities and was designed to meet multiple accident criteria. The 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. If a fire does occur, it is probable that the substantial construction

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Licensing Action: Access Hatch - Unrated Containment Hatch - BTP C.5.a(5)

of the air lock will prevent fire propagation through the containment boundary. Therefore, an unrated containment access hatch is an acceptable deviation from Section C.5.a (5) of BTP CMEB 9.5-1.

Validation/Conclusions:

The bases for previous acceptance remain valid as described in the applicable sections above. The deviation for the unrated containment access hatch is being transitioned to the new licensing basis per NFPA 805.

Disposition:

Licensing Action acceptable for transition

References:

- 10080-B-085, Revision 14, "Fire Hazard Analysis."
- NFPA 805, Revision 2001, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants."
- NUREG-1057, Supplement 5, "NRC SSER - NUREG-1057, Supplement 5 dated May 1987."
- UFSAR, Revision 22, "BVPS-2 Updated Final Safety Analysis Report."

Associations:

Ch.4 - Compartment: 2-RC-1
Fire Protection - Fire Compartment: 2-RC-1 / Form: Passive Protection