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A001

TRM

APPROVED AMENDMENT TO
UNIT 2 TECHNICAL REQUIREMENTS MANUAL
EFFECTIVE DATE 12/31/2002

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SUSQUEHANNA STEAM ELECTRIC STATION
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3.6 Containment

3.6.4 Primary Containment Closed System Boundaries

TRO 3.6.4 Primary Containment Closed System boundaries shall be OPERABLE.

APPLICABILITY: When Primary Containment Isolation Valves (PCIVs) for lines in which the redundant isolation barrier is a closed system are required to be OPERABLE per LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)."

-----NOTE-----
Primary Containment Closed System boundaries may be unisolated intermittently under administrative controls.

ACTIONS

- NOTES-----
1. Separate Condition entry is allowed for each Primary Containment Closed System.
 2. Enter applicable Conditions and Required Actions for systems made inoperable by inoperable Primary Containment Closed System boundaries.
 3. If Conditions and Required Actions for this TRO are not completed, LCO 3.0.3 shall be entered, not TRO 3.0.3.
 4. Penetration flow paths may be unisolated intermittently under administrative controls.
 5. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when Primary Containment Closed System boundary leakage results in exceeding overall containment leakage rate acceptance criteria in MODES 1, 2, and 3.

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|------------------|
| A. One or more penetration flow paths with its Primary Containment Closed System boundary inoperable and its corresponding PCIV(s) OPERABLE. | A.1.1 Isolate the affected portion of system piping from the rest of the closed system and primary containment by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. | 4 hours |
| | <u>AND</u> A.1.2 Verify the affected portion of system piping is isolated from the rest of the closed system and primary containment. | Once per 31 days |

TECHNICAL REQUIREMENT SURVEILLANCE

| SURVEILLANCE | | FREQUENCY |
|--------------|--|--|
| TRS 3.6.4.1 | Verify Primary Containment Closed System boundary is intact. | 92 days |
| TRS 3.6.4.2 | Verify Primary Containment Closed System integrity. | In accordance with the Leakage Rate Test Program |

Primary Containment Penetration Conductor Overcurrent Protective Devices
3.8.1

TABLE 3.8.1-1 (Page 2 of 2)
PRIMARY CONTAINMENT PENETRATION CONDUCTOR
OVERCURRENT PROTECTIVE DEVICES

| Circuit Breaker Designation | | System/Equipment Powered |
|--|---|----------------------------|
| B. Type HFB-M | | |
| 1. | 2B236023 2B236023A | Cont Inst. Gas/HV-22603 |
| 2. | 2B246022 2B246022A | RCIC/HV-E51-2F007 |
| 3. | 2B237072 2B237072A | NSSS/HV-B21-2F016 |
| 4. | 2B236102 2B236102A | NSSS/HV-B21-2F001 |
| 5. | 2B246112 2B246112A | NSSS/HV-B21-2F002 |
| 6. | 2B246113 2B246113A | NSSS/HV-B21-2F005 |
| 7. | 2B236053 2B236053A | RWCU/HV-G33-2F001 |
| 8. | 2B253052 2B253052A | RWCU/HV-G33-2F102 |
| 9. | 2B263043 2B253043A | RWCU/HV-G33-2F100 |
| 10. | 2B263052 2B263052A | RWCU/HV-G33-2F106 |
| 11. | 2B246062 2B246062A | RBCCW/HV-21346 |
| 12. | 2B246012 2B246012A | RBCCW/HV-21345 |
| 13. | 2B253063 2B253063A | Drywell Sump/2P402A |
| 14. | 2B263071 2B263071A | Drywell Sump/2P402B |
| 15. | 2B253043 2B253043A | Drywell Sump/2P403A |
| 16. | 2B263072 2B263072A | Drywell Sump/2P403B |
| C. Type KB-TM | | |
| 1. | 2B216092 2B216083 | Cont. H2 Recombiner/2E440A |
| 2. | 2B226103 2B226102 | Cont. H2 Recombiner/2E440B |
| 3. | 2B236103 2B236122 | Cont. H2 Recombiner/2E440C |
| 4. | 1B246033 2B246044 | Cont. H2 Recombiner/2E440D |
| D. Circuit Breakers Tripped by Overcurrent Relays | | |
| 1. | 2A20501 2A20502 | Rx Recirc/2P401A |
| 2. | 2A20601 2A20602 | Rx Recirc/2P401B |

B 3.6.4 - Primary Containment Closed System Boundaries

BASES

TRO

A closed system used as a primary containment isolation boundary is defined as a piping system outside primary containment that does not communicate directly with the atmosphere outside primary containment, meets the design requirements of NUREG-75/087, (Reference 1), as described in FSAR Section 6.2.4 (Reference 2), and is considered an extension of primary containment. The design of several containment penetrations relies upon a single Primary Containment Isolation Valve (PCIV) and a closed piping system outside primary containment (Primary Containment Closed System) as the two isolation barriers, as identified in Technical Specification (TS) Bases, Table B 3.6.1.3-1. For a given containment penetration that relies upon a closed system as the redundant containment isolation barrier, the closed system boundary is essentially equivalent to the ASME Class 2 boundary for the system/loop which contains the penetration. The closed system boundaries are defined by the Leakage Rate Test Program.

As a special case, the containment penetrations for the H₂O₂ analyzer lines also rely upon a closed system as the redundant containment isolation barrier, even though two PCIVs are provided for each of these penetrations. The PCIVs associated with these penetrations are identified in TS Bases Table B 3.6.1.3-1. The PCIVs in each H₂O₂ analyzer penetration are redundant to each other with regard to mechanical operation, but are not redundant with regard to electrical operation. Both PCIVs in each of these penetrations are powered from the same electrical division in order to prevent a single electrical failure from resulting in a loss of both divisions of H₂O₂ analyzers. This results in the valves being susceptible to a single electrical failure which could result in both valves failing open or failing to remain closed. Because of this unique design consideration, the H₂O₂ penetrations are equivalent to penetrations having a single PCIV, with the closed system providing the redundant isolation barrier.

For penetrations with a single PCIV, alteration of the corresponding closed system boundary during power operation is permitted provided that alteration does not impact the containment isolation function of the PCIV, [i.e., able to be closed (automatically or manually) or remain closed, and maintain leakage within that assumed in the design basis loss of coolant accident dose analysis.] Conversely, if a PCIV is in a configuration where it is not capable of performing its containment isolation function (e.g., stuck open), then closed system integrity must be maintained in order to have at least one containment isolation barrier operable. These requirements also apply to the H₂O₂ analyzer penetrations.

B 3.6.4 - Primary Containment Closed System Boundaries

BASES (continued)

TRO
(continued) The APPLICABILITY is modified by a Note allowing Primary Containment Closed System boundaries to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communications with the control room. In this way, the Primary Containment Closed System can be rapidly isolated when a need for primary containment isolation is indicated.

Opening of closed system boundary valve periodically for specific activities that require the valve to be opened (e.g., testing, venting) is not considered a breach of a closed system, provided the valve is operated under administrative control. Examples include the opening of a high point vent in the Core Spray system to verify that the system is filled with water or the opening of a H₂O₂ analyzer boundary valve to perform a functional test of the Post Accident Sampling System. Similarly, stroking of a boundary valve as part of restoration from maintenance activities associated with that valve does not constitute a breach of the closed system. Examples of this would be the stroking of a valve where the work that was done was replacement of the motor actuator, or other work where the pressure boundary of the valve was not violated. Also, the opening of a valve as a result of normal system operation/testing does not constitute a breach of the closed system.

B 3.6.4 - Primary Containment Closed System Boundaries

BASES (continued)

ACTIONS These ACTIONS are provided to address Conditions where Primary Containment Closed System boundaries are inoperable. When the Primary Containment Closed System boundaries are OPERABLE, but the associated PCIV(s) is inoperable, LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," Condition C or Condition D would apply.

Note 1 has been added to provide clarification that, for the purpose of the TRO, separate Condition entry is allowed for each closed system. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable closed system. Complying with Required Actions may allow for continued operation, and subsequent inoperable PCIVs or closed systems are governed by subsequent Condition entry and application of associated Required Actions.

The ACTIONS are modified by Notes 2 and 5. Note 2 ensures that appropriate remedial actions are taken, if necessary, if the affected system(s) are rendered inoperable by an inoperable closed system (e.g., an Emergency Core Cooling System subsystem is inoperable due to a failed open drain valve). Note 5 ensures appropriate remedial actions are taken when the primary containment leakage limits are exceeded. Pursuant to TRO 3.0.6, these actions are not required even when the associated TRO is not met. Therefore, Notes 2 and 5 are added to require the proper actions be taken when Primary Containment Closed System boundaries are inoperable.

Note 3 has been added to provide clarification that failing to complete the Required Actions results in a condition that could compromise Primary Containment Integrity and thus, place the plant in an unanalysed condition.

The ACTIONS are modified by Note 4 allowing penetration flow path(s) to be unisolated intermittently under administrative controls. This note applies to a condition where the closed system is inoperable. It does not apply to a situation where a penetration flowpath is normally open and the closed system is OPERABLE (such as the RHR and Core Spray minimum flow return lines), since that represents the normal design configuration. Administrative controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated.

B 3.6.4 . . . Primary Containment Closed System Boundaries

BASES (continued)

ACTION
(continued)

A.1.1, A.1.2, A.2.1, and A.2.2

With one or more penetration flow paths with its Primary Containment Closed System boundary inoperable, the affected portion of the closed system piping must be isolated from the rest of the closed system and the primary containment. This Condition only applies when the associated PCIV for the penetration flow path is OPERABLE. For the penetration flow paths associated with the H₂O₂ analyzers, both PCIVs must be OPERABLE. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. Closing an intervening valve between the breach in the closed system and the open penetration is permitted when the penetration PCIV is OPERABLE. If no intervening valve exists between the closed system breach and the PCIV, then the PCIV must be closed and deactivated to ensure compliance with LCO 3.6.1.1, "Primary Containment." For the penetration flow paths associated with the H₂O₂ analyzers, one PCIV must be closed and deactivated. Deactivation of the H₂O₂ analyzer PCIVs is discussed in the TS Bases for LCO 3.6.1.3, Condition D.

The Required Actions to isolate the closed system breach, or the penetration, must be completed within the 4 hour Completion Time. The Completion Time of 4 hours is consistent with LCO 3.6.1.3, Condition A, which applies to penetration flow paths with two PCIVs. The Primary Containment Closed System boundary is considered to be the functional equivalent to the ASME Class 2 boundary for the system/loop which contains the penetration. Because this boundary serves as the second barrier required by General Design Criteria 55 and 56 (Ref. 3) in lieu of a second isolation valve, the same Required Actions and associated Completion Times are appropriate.

For inoperable closed system boundaries where the breach has been isolated from the rest of the closed system and primary containment (Required Action A.1.1), or where the penetration has been isolated by a closed and deactivated PCIV (Required Action A.1.2), the affected penetration flow path(s) must be verified to be isolated on a periodic basis. This is necessary to ensure that primary containment penetrations required to be isolated following an accident, and no longer capable of being automatically isolated, will be in the isolation position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification that those devices outside containment and capable of potentially being mispositioned are in the correct position. The Completion Time of "once per 31 days" is consistent with LCO 3.6.1.3, Condition A, and is appropriate because the devices are operated under administrative controls and the probability of their misalignment is low.

B 3.6.4 - Primary Containment Closed System Boundaries

BASES (continued)

ACTION
(continued)

B.1 and B.2

With one or more penetration flow paths with its Primary Containment Closed System boundary inoperable, the affected penetration flow path must be isolated within 1 hour when the corresponding PCIV for the penetration flow path is also inoperable. For the penetration flow paths associated with the H₂O₂ analyzers, this Condition applies when one or both PCIVs are inoperable. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The 1 hour Completion Time is consistent with the LCO 3.6.1.3, Condition B, which applies to penetration flow paths with two PCIVs, both of which are inoperable. Alternatively, immediate entry into the applicable Conditions and Required Actions of LCO 3.6.1.1 is permitted.

C.1

If the Required Actions and associated Completion Times of Conditions A or B cannot be met, immediate entry into LCO 3.6.1.3, Condition G or H, is directed. The appropriate Condition to enter is determined by the operating MODE of the unit at the time of entry.

TRS

TRS 3.6.4.1

The boundaries for water filled closed systems are verified to be intact by direct observation, during operator rounds, of the lack of leakage from the system (which is under pressure from the keepfill system), or by observed integrity during functional testing as required by the applicable LCO; and by the system boundary administrative controls (i.e., by procedure and checkoff lists for evolutions that affect the system boundary). The integrity of a closed system boundary, verified in accordance with the methodologies described above, is not compromised throughout the effective surveillance period by the subsequent isolation of the keepfill system and/or depressurization of a closed system.

The boundaries for air filled closed systems are verified to be intact by verification that no work has been performed since the last leak rate test in accordance with TRS 3.6.4.2, and by the system boundary administrative controls (i.e., procedure and checkoff lists for evolutions that affect the system boundary).

The Frequency corresponds to the Inservice Testing Program requirements for performing valve testing at least once every 92 days.

B 3.6.4 - Primary Containment Closed System Boundaries

BASES (continued)

TRS
(continued)

TRS 3 6.4.2

When restoring a closed system, testing must be performed to verify system integrity. Explicit quantification of the leakage is not required for water filled closed systems. However, testing must be sufficient to assure that an essentially leaktight barrier exists (no gross leakage). For air filled closed systems, explicit leakage quantification is required, and is performed in accordance with the Leakage Rate Test Program.

The Frequency of testing is in accordance with the Leakage Rate Test Program.

- REFERENCES
1. NUREG-75/087, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants", September 1975.
 2. FSAR Section 6.2.4, "Containment Isolation System."
 3. 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants."
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