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SUBJECT: Forwards Proposed Amend 115 to License NPF-22,requesting emergency change to TS 3.6.1.8 to allow continued operation w/valve HV25703 inoperable.

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SEP 14 1993

Director of Nuclear Reactor Regulation
Attention: Mr. C. L. Miller, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENT NO. 115 TO LICENSE NPF-22:
EMERGENCY REQUEST RELATED TO INOPERABLE PURGE VALVE
PLA-4022 **FILES A17-2/R41-2** **Docket No. 50-388**

Dear Mr. Miller:

References: 1. Letter, PLA-4019, R.G. Byram to C.L. Miller, "Request for Discretion: Inoperable Containment Purge Valve," dated September 8, 1993.

2. Letter, J.A. Calvo to R.G. Byram, "Notice of Enforcement Pennsylvania Power and Light Company, Susquehanna Steam Electric Station, Unit 2 (PLA-4019) (TAC No. M87449)," dated September 10, 1993.

The purpose of this letter is to request an emergency change to the Susquehanna SES Unit 2 Technical Specifications. On September 8, 1993, PP&L proposed enforcement discretion (Ref. 1) until this request could be submitted to and subsequently reviewed by the NRC. The NRC granted enforcement discretion (Ref. 2) on September 10, 1993.

BACKGROUND

Refer to the attached Figure 1 for the following discussion.

At 1715 hours on September 7, 1993, the 18" inboard suppression chamber purge valve HV-25703 was declared inoperable due to its inability to pass Technical Specification Requirement 4.6.1.8.2, which requires that the measured leakage rate is less than or equal to 0.05 L_a when pressurized to P_a. Accordingly, Actions 3.6.1.8b and 3.6.3a were simultaneously entered.

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The requirements of 3.6.3a were accomplished within the required time limits by isolating the affected penetration. Outboard valve HV25704 and bypass valve HV25705 were deactivated and secured closed. Acoustic monitoring of the HV25703 valve and of the common SGTS ductwork beyond the HV25704 and HV25705 valves has confirmed that the HV25703 valve is providing the gross leakage path.

PP&L has subsequently performed vacuum leak rate testing across the HV25704 and HV25705 valves to ensure that these valves have not developed any significant leakage. These tests confirmed that the last local leak rate test value attributed to the penetration still applies to valve HV25704 and HV25705 valves. Based on the above, the current configuration of the penetration of concern is that valve HV25703 is inoperable, and valves HV25704 and HV25705 are operable, deactivated, and secured closed.

Action 3.6.1.8b requires that the HV25703 valve be restored to operable status within 24 hours, or the unit must be placed in a shutdown condition. Efforts to mitigate leakage through the 03 valve have been unsuccessful.

As a result, a Technical Specification change is proposed to revise the requirements of TS 3.6.1.8 to allow continued operation with valve HV25703 inoperable. Additional requirements are imposed to ensure that the design and licensing basis for penetration X-202 are met with valve HV25703 inoperable.

DESCRIPTION OF PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS

As shown on the attached markup, a temporary Action c has been added that addresses the inoperability of the HV-25703 valve. Also, temporary Surveillances 4.6.1.8.3 and 4.6.1.8.4 have been added to serve as compensatory actions to ensure containment isolation dependability while HV-25703 is inoperable. The duration of the above changes is covered by proposed footnotes "#" and "##" which allows these requirements to be utilized until the first unit shutdown not to exceed the sixth refueling and inspection outage. These proposed changes are consistent with the requirements imposed by Reference 2.

SAFETY ANALYSIS

Purge Valve Design and Licensing Basis

As required by General Design Criteria (GDC) 56 to 10CFR50, Appendix A, primary containment isolation for containment penetration No. X-202 to the suppression pool airspace is provided by air operated, purge and vent valve HV25703, and redundant valves HV25704 and HV25705 (see attached Figure 1). These valves fail closed during LOCA conditions to limit the

total containment leakage from all Type B and C penetrations to less than a leakage rate of 0.6 L_a (where L_a equals the design containment leakage rate of 1% percent by weight of the containment air per 24 hours at 45 psig). The design leakage rate ensures that offsite doses for a LOCA are within the requirements of 10CFR100. Redundant valves are provided to ensure that containment integrity for the penetration is maintained for postulated single failure of any one of the three valves.

Technical Specification (TS) Surveillance Requirement 4.6.1.8.2 requires that a local leak rate test (LLRT) be conducted for the resilient seal valves HV25703 and HV25704 at least once per six months by confirming the leakage is less than 0.05 L_a. The 0.6 L_a leakage limit shall also not be exceeded when the leakage rates determined for penetration X-202 (maximum 0.05 L_a) are added to the previously determined total for all valves and penetrations subject to Type B and C tests. With only one resilient seal valve inoperable, the action statement for TS 3.6.1.8 allows 24 hours to restore the inoperable resilient seal valve to operable status or be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown within the following 24 hours. Unlike Type C penetrations with non-resilient seals governed by TS 3.6.3, this requirement is imposed if only one resilient seal valve is declared inoperable. Credit for the remaining operable resilient seal valve is not allowed.

For Type C penetrations with non-resilient seal valves, continued operation is allowed with one valve declared inoperable by closing and de-activating both penetration valves in accordance with TS 3.6.3. The more stringent requirements in TS 4.6.1.8.2 are derived from the NRC's concerns with the potential for gross failure of resilient seal valves. The separate LLRT requirements for the resilient seal valves HV25703 and HV25704 is to detect early degradation of the resilient seal material to allow repairs to be made prior to gross leakage failure. The resilient seal provides a superior seal for air if the resilient seal is not dislodged or damaged. Unlike a metal-to-metal seal, the failure or dislodging of the resilient seal would result in a gap between the disc and seat.

The purge and vent valves HV25703, 25704 and 25705 remain closed during normal operation to fulfill their containment isolation function. The closed valves will protect the downstream Standby Gas Treatment System (SGTS) filters and ductwork against the pressure affects of a LOCA. This ensures that the LOCA pressure affects will not render SGTS inoperable. However, the valves are opened during containment inerting, deinerting and pressure control. A postulated LOCA occurring during the times the purge and vent valves are open (inerting and deinerting) has the potential for adversely affecting the structural integrity of downstream Standby Gas Treatment System (SGTS) filters. For this reason, TS 3.6.1.8 specifies a 90 hour/year time limit for opening purge valves HV25703 and HV25704 during Operational Conditions 1, 2 and 3. The NRC accepts a 90 hour time limit as being low enough to not have to postulate a LOCA concurrent with the purge valves being open. The 90 hour limit is not imposed on the subject valves when pressure control is being performed through the 2-inch

bypass line (HV25705), since a pressure surge through this line does not threaten the structural integrity of SGTS.

Valves HV25703, 25704 and 25705 are also relied upon to perform suppression chamber pressure and combustible gas control as stipulated in the Emergency Operating Procedures (EOP), but this function is not governed by Technical Specifications.

Technical Justification for the Proposed Technical Specification Change

The proposed Technical Specification change does not prevent the valves associated with penetration X-202 from performing their design basis function as described below:

Containment Isolation

Containment isolation of penetration X-202, as required by GDC 56, will be maintained by the following actions required by the proposed Technical Specification change:

1. The resilient seal valve HV25704 will be administratively maintained in the de-activated and closed position in Conditions 1, 2 and 3, in accordance with TS 3.6.3. The resilient seal valve HV25703 and 2"-bypass valve HV25705 will also be administratively maintained in the de-activated and closed position from September 8, 1993, until valve HV25703 is repaired during the next forced outage or no later than the next refueling outage. In addition, once-per-31 days the penetration flow path will be verified to be isolated and power removed to all valves. In accordance with TS 3.6.3, the inboard valve HV25703 and 2" bypass valve HV25705 will be reopened intermittently under administrative control for short periods to ensure containment pressure is controlled within TS limits. Containment pressure can increase for various reasons, such as during performance of the monthly surveillance testing of the High Pressure Coolant Injection (HPCI) system that adds heat to the suppression pool. An independent check to assure closure and power removal will be performed after each opening of HV25703 and HV25705.

2. The proposed TS change requires that a leak rate test be conducted on valves HV25704 and HV25705 to provide additional assurance that the valves will perform their containment isolation function. For the first three months, the leakage test will be conducted once per month with a leakage criterion of 0.01 L_a. If the leakage is less than or equal to 0.01 L_a, a test frequency of once every 3 months will be used thereafter to confirm that there is no significant increase in the leakage of valves HV25704 and HV25705. The leakage criterion will continue to be 0.01 L_a.

The test will be conducted at a differential pressure less than P_a (45 psig) due to leakage through HV25703, and the leakage will be extrapolated to 45 psig. Extrapolation of the leakage to 45 psig assumes that the leakage area does not increase as the pressure increases. The valve design incorporates a resilient seal design which maintains a tighter seal as the differential pressure across the valve increases. Therefore, the leakage area at a lower differential pressure is expected to be conservative relative to the leakage area at 45 psig. Failure to meet the leakage test acceptance criterion will provide early indication that the resilient seal for HV25704 requires repair prior to gross seal failure and will also confirm the leak tightness of the 2-inch bypass valve HV25705.

LLRT testing to date has not identified a problem with leakage integrity for resilient seal valves. Valves HV25704 and HV25705 LLRT history indicates that the valves have consistently maintained their leakage within the TS requirements. For the penetrations where resilient seal purge and vent valves similar to HV25704 are installed, approximately 85 and 68 LLRTs have been performed for Units 1 and 2, respectively. Of these tests, there were only two failures and three reworks[1]. None of the rework or failures were for valves HV25704 and HV25705.

3. The proposed TS change requires that the resilient seal valve HV25704 be de-activated and closed until repairs are conducted on HV25703. After closing HV25704, the integrity of the resilient seal will be confirmed by the leak rate test in 2. above. Once the valve is closed and the leakage test confirms acceptable leakage, the only credible method to damage or displace the seal is to open or close the valve. The proposed TS change precludes opening valve HV25704 in Operational Condition 1, 2 and 3 until HV25703 is repaired. Therefore, gross failure of the resilient seal is unlikely during the time period for which HV25703 is inoperable.

4. The proposed TS change requires that valves HV25703, HV25704 and HV25705 be de-activated and secured closed. This action, combined with the leak rate testing in 2. above, provides an acceptable containment isolation boundary for penetration X-202 and, based on administrative controls per TS 3.6.3, is not subject to the single failure criterion. As stated in 1. above, only valves HV25703 and HV25705 will be opened under administrative control for periodic primary containment pressure control. Resilient seal valve HV25704 will remain de-activated and closed until valve HV25703 is declared operable.

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[1] A failure constitutes exceeding the TS acceptance criterion of 0.05 L_a. Rework constitutes leakage that meets the TS limit, but exceeds the program goal established locally for the penetration.

5. Valves HV25703 and HV25705 will be opened periodically to control suppression chamber pressure within Technical Specification limits. Pressure control is required when heat is added to the suppression pool (e.g., HPCI surveillance testing) and during nitrogen makeup, which is required periodically to maintain the suppression pool airspace inerted. Pressure control may be required approximately once a month. The opening of valves HV25703 and HV25705 will be administratively controlled under TS 3.6.3 and ensures that they will only be opened during the time required for pressure control. Following pressure control, valves HV25703 and HV25705 will again be de-activated and de-energized in the closed position.

Protection of SGTS

The above discussion confirms that valves HV25704 and HV25705 will provide a containment isolation function that complies with GDC 56. Containment isolation ensures the downstream SGTS filters and ductwork will not be adversely impacted for LOCA conditions during the time the valves are closed. The 90 hour/year operational limit for valve HV25704 is still retained for the proposed TS change and provides additional assurance that the structural integrity of the downstream SGTS is maintained for LOCA conditions. In addition, administrative control by TS 3.6.3 will allow valves HV25703 and HV25705 to be opened for suppression chamber pressure control. A postulated LOCA during the time valve HV25705 is open will not adversely affect the SGTS filters and ductwork, since analysis has shown that the pressure resulting from a LOCA through the bypass pathway does not adversely affect the structural integrity of the SGTS filters and ductwork.

Emergency Operating Procedures (EOP)

The EOPs utilize valves HV25703, 25704 and 25705 to maintain pressure and combustible gas control in the suppression chamber. The impact of de-activating and de-energizing valves HV25703, 25704 and 25705 on the EOPs has been reviewed and found to be acceptable. This is based on the fact that if pressure and combustible gas control were required, the de-activated valves could be activated in the relay rooms and be available for opening from the control room as required by the EOPs. The valves are activated by re-installing fuses in the relay rooms, which is a relatively simple procedure that is not expected to delay the availability of the valves. Therefore, the proposed TS change has no adverse impact on the EOPs.

Likewise, the proposed TS change has been found to have no adverse impact on the Susquehanna IPE.

CONCLUSION

The proposed TS change ensures that the outer containment isolation valves HV25704 and HV25705 for penetration X-202 are de-activated and closed until valve HV25703, which will also be de-activated and closed, can be repaired and declared operable. Valves HV25703 and HV25705 will be opened periodically for containment pressure control under administrative requirements of TS 3.6.3. Additional leak rate testing will be conducted on HV25704 and HV25705 to verify the valves have no increased leakage, and can meet containment isolation criterion. These actions, coupled with the reliability of previous LLRT data for valves HV25704 and HV25705, ensures that the de-activated valves will maintain containment integrity until HV25703 can be repaired and declared operable. Also, the proposed TS change has no adverse impact on the protection of the SGTS system and EOP requirements. Finally, valve HV25703 will be repaired the next time Unit 2 is shutdown. Based on the above, the overall safe operation of Susquehanna SES is assured with the proposed Technical Specification change. Granting of this Technical Specification change will not affect public health and safety.

COMPENSATORY ACTIONS

These actions are shown on the attached marked-up Technical Specification page, and discussed above under safety analysis. To reiterate, they are:

- Isolation and deactivation of the HV-25703, HV-25704, and HV-25705 valves, with the exception that the 03 and 05 valves may be opened under administrative control. The required position of these valves will be verified every 31 days, and for the 03 and 05 valves it will also be verified after completion of permitted evolutions that require their opening.

- Performance of vacuum leak rate testing on the HV-25704 valve every 31 days to a more restrictive acceptance criterion of 0.01 L_a. If this criterion is satisfied after 3 tests, the frequency may be change to once per 92 days. The acceptance criterion will remain at 0.01 L_a until the HV-25703 valve is operable.

NO SIGNIFICANT HAZARDS CONSIDERATIONS

The proposed change does not:

1. **Involve a significant increase in the probability or consequences of an accident previously evaluated.**

   Compensatory actions are delineated and discussed above, and have been included in the attached proposed Technical Specifications. These actions, coupled with the expected reliability of the HV25704 valve since it 1) will not be cycled, 2) will undergo accelerated leak rate testing with a more stringent acceptance criterion, and 3) has a good leak rate test

history, will combine to ensure the containment isolation function is dependable for the penetration of concern.

The dependability of the containment isolation function will also serve to ensure that the integrity of the SGTS is not threatened due to a postulated event which would pressurize this penetration.

Based on the above, neither the probability nor the consequences of an accident previously evaluated is significantly increased by the proposed change.

2. **Create the possibility of a new or different type of accident from any accident previously evaluated.**

   All efforts associated with this proposal are aimed at ensuring containment isolation dependability. These compensatory actions will be performed under strict administrative controlled for a temporary period of time in order to ensure that the penetration of concern will be isolated when necessary. Failure of these actions will not create any different type of event from failure of the normal isolation function.

3. **Involve a significant reduction in a margin of safety.**

   As described in 1. above, the compensatory actions to ensure the dependability of the containment boundary are sufficient to ensure that a significant reduction in a margin of safety will not occur.

BASIS FOR EMERGENCY REQUEST

10CFR 50.91 provides guidance on what information the NRC requires in support of an application for an emergency change.

First, it requires the applicant to justify that an emergency exists, i.e. "...failure to act in a timely way would result in derating or shutdown of a nuclear power plant...". As evidenced by the references 1 and 2, Susquehanna Unit 2 must be shutdown per Specification 3.6.1.8 lacking intervention by the NRC based on the safety justification provided by PP&L.

Secondly, 10CFR50.91 requires the licensee to "... explain why this emergency situation occurred and why it could not avoid this situation ...". The failure of HV-25703 was an unanticipated failure of a component during the performance of a Technical Specification Surveillance Requirement. Previous surveillance trends did not indicate a problem; repairs to the resilient seal can not be affected with the unit at power. Based on the time necessary to evaluate this problem, interact on enforcement discretion, and to prepare and review this proposal internally, we believe that this application has been submitted in a timely fashion.

EVALUATION OF ENVIRONMENTAL CONSEQUENCES

This submittal is consistent with the design basis of Susquehanna SES, in that adequate compensatory actions have been proposed to ensure the dependability of the containment isolation function. Therefore, no environmental consequences that have not been previously considered are anticipated.

Very truly yours,

R. G. Byram

Attachment

cc: NRC Document Control Desk (original)
NRC Region I
Mr. G. S. Barber, NRC Sr. Resident Inspector - SSES
Mr. R. J. Clark, NRC Sr. Project Manager - Rockville
Mr. W. P. Dornsife, Pa DER