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AUTH.NAME AUTHOR AFFILIATION
BYRAM,R.G. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
MILLER,C.L. Project Directorate I-2

SUBJECT: Forwards application for emergency amend 118 to license NPF-22,changing TS 3.0.4,4.0.4,3.3.7.5 Action 80,4.3.7.5, 3.4.2 Action c & 4.4.2 to allow continued operation w/one acoustic monitor inoperable.

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PP&L Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101-1179 • 610/774-5151

Robert G. Byram
Senior Vice President—Nuclear
610/774-7502
Fax: 610/774-5019

JAN 24 1994

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. 118 TO LICENSE NO. NPF-22 :
EMERGENCY REQUEST RELATED TO INOPERABLE
ACOUSTIC MONITOR
PLA-4085 **FILES A17-2/R41-2** **Docket No. 50-388**

Reference: **Letter, PLA-4084, R.G. Byram to C.L. Miller, 'Request for Enforcement Discretion: Inoperable Acoustic Monitor," dated January 24, 1994.**

Dear Mr. Miller:

The purpose of this letter is to request an emergency change to the Susquehanna SES Unit 2 Technical Specifications. On January 21, 1994, PP&L verbally requested enforcement discretion (Ref). The NRC granted enforcement discretion on January 21, 1994, at 3:00 PM contingent upon the submittal of this Technical Specification change by January 24, 1994.

BACKGROUND

On January 20, 1994, Susquehanna SES Unit 2 experienced a scram from 100% power due to a turbine/generator trip on high temperature in the stator cooling water. A problem with the stator cooling temperature control valve controller linkage caused the valve to reposition such that all flow bypassed the heat exchanger.

During the startup from this scram, the acoustic monitor for the "S" main steam safety relief valve (SRV) spuriously alarmed. The "S" SRV was verified closed through numerous other indications. An I&C investigation, along with a discussion with the equipment vendor, revealed the problem to be with the acoustic monitoring system components located inside containment. Repair would require shutdown and containment entry. Since the acoustic monitor could not be relied upon to provide an accurate indication, it was declared inoperable on January 21, 1994, at 6:05 AM and the appropriate LCO was entered.

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Since the Commonwealth of Pennsylvania was under an emergency energy declaration, and the load on the Pennsylvania-New Jersey-Maryland (PJM) interconnection was more than the generating capacity, enforcement discretion was requested to allow Unit 2 to continue to startup and supply needed power. Enforcement discretion was verbally granted at 3:00 PM on January 21, 1994, with the stipulation that an emergency Technical Specification change be submitted on January 24, 1994.

This Technical Specification change is in response to that requirement. This Technical Specification change is proposed to allow continued operation with one acoustic monitor inoperable. The Technical Specifications affected by this change are 3.0.4, 4.0.4, 3.3.7.5 Action 80, 4.3.7.5, 3.4.2 Action c, and 4.4.2.

PROPOSED TECHNICAL SPECIFICATION CHANGE

As shown on the attached markup, a temporary change to Specifications 3.0.4, 4.0.4, 3.3.7.5 Action 80, 4.3.7.5, 3.4.2 Action c, and 4.4.2 to allow continued operation with the acoustic monitor for the "S" SRV has been taken. The duration of the temporary changes is by the proposed footnotes which allow the acoustic monitor for the "S" SRV to be inoperable until the first shutdown of sufficient duration to allow for containment entry but not to exceed the sixth refueling and inspection outage. These proposed changes are consistent with the enforcement discretion discussion held on January 21, 1994.

Attachment 1 shows the proposed Technical Specification change.

SAFETY ANALYSIS

Safety/Relief Valve Position Indication Design and Licensing Bases

The requirement for the safety/relief valve position indicator system is contained in TMI Item II.D.3. This item requires the operator be provided with an unambiguous indication of valve position (open or closed) so that appropriate operator actions can be taken. The valve position should be indicated in the control room. An alarm should be provided in conjunction with this indication. The valve position indication may be safety grade. If the position indication is not safety grade, a reliable single-channel direct indication powered from a vital instrument bus may be provided if backup methods of determining valve position are available and are discussed in the emergency procedures as an aid to operator diagnosis of an action.

As described in FSAR Sections 18.1.24 and 7.6.1b.1.7 (Attachment 2), the safety/relief valve position indication is a safety grade system, indicated and alarmed on a control room panel, and powered from a Class 1E vital instrument bus. Also backup methods of determining valve position are available and are discussed in the off-normal procedures.

Technical Justification for the Proposed Technical Specification Change

The acoustic monitor does not affect the operation of the safety relief valve. The valve functions (safety-related Safety function, and non-safety related automatic and manual relief functions) are independent of the acoustic monitoring function. No failure or misoperation of the acoustic monitor can affect the ability of the safety relief valve to perform it design functions. The design purpose of the acoustic monitor is to increase the probability that a failure of the valve is detected.

Operation without the acoustic monitor will not increase the plant vulnerability to the event nor will it create any condition where the reliability of the valve is reduced.

The SSES IPE assigns a conservative 1% probability to the stuck open safety/relief valve. The lack of position indication does not affect this probability.

Section 15.1.4 of the FSAR evaluates the Inadvertent SRV Opening as an event of moderate frequency. As documented in the SSES Design Assessment Report, NUREG-0783 requires that a postulated stuck open safety/relief valve (SORV) transient be analyzed to verify that the maximum pool temperature remains below the quencher instability temperature. In this analysis no credit is taken for the safety/relief valve position indication system. The SORV analysis assumes that the operator will take actions to scram the reactor, initiate RHR pool cooling and initiate reactor depressurization in accordance with Technical Specification 3.6.2.1. This Technical Specification requires the operator to manually scram the plant when the suppression pool temperature exceeds 110°F. The suppression pool temperature monitoring system (SPOTMOS) provides the operator with safety grade, redundant pool temperature information from which to take actions in accordance with Technical Specification 3.6.2.1. This analysis indicates that the maximum pool temperature is below 208°F (165°F for the case where the MSIVs remain open and 185°F for the case where the MSIVs close). This analysis complies with the NUREG-0783 pool temperature analysis. Therefore, the proposed Technical Specification has no adverse impact on the containment SORV analysis.

Besides the acoustic monitors, safety/relief valve position can be detected through several other indications. These are:

Suppression pool temperature
RPV pressure
RPV level swell
Suppression pool level
Suppression chamber pressure
Indicated feedwater flow greater than steam flow
Loss of generator MWe

These indicators and symptoms are already in the procedures (ON-283-001) and are trained on by the operators.

For the "S" SRV, Suppression Pool Temperature Elements TE 25757 thru TE 25761 are in proximity to the SRV discharge line quencher and would see an elevated temperature if the SRV were open. In addition tail pipe temperature provides indication that the SRV is open.

A PCAF of ON-283-001 provides additional guidance on monitoring SRV position with the "S" SRV acoustic monitor inoperable.

The Emergency Operating procedure for reactor Pressure Control (EO-200-102) provides a control step alerting the operator to the consequences and steps to control SRV cycling. In addition to the potential damage to the valve itself, there are reactor water level fluctuations and significant dynamic loads imposed on the RPV, on the SRV tail pipes and on the primary containment structures when a SRV cycles. The operator is directed to lower the pressure to below the relief pressure setpoint. This lowering of pressure would stop any SRV from cycling, and does not require identification of the operating valve.

The primary means available of detect SRV cycling is the acoustic monitor. Secondary indication from reactor pressure would distinctly indicate a cycling SRV, as would the level fluctuations. Switch setpoint hysteresis would create pressure fluctuations with a relatively long period, on the order of one minute open (depressurizing), five minutes closed (repressurizing).

Review of the Improved Technical Specifications (ITS), NUREG 1433, for these same Accident Monitoring Instrumentation reveals that these requirements (TS 3.3.7.5, 3.4.2, and associated surveillance requirements) did not satisfy the NRC Interim Policy Statement technical specification screening criteria and are no longer Tech Spec requirements under ITS.

CONCLUSION

The proposed Technical Specification change does not affect the stuck open relief valve analysis for Susquehanna SES since the SORV analysis did not take credit for the acoustic monitoring system. In addition safety/relief valve position can be determined from a variety of indications and symptoms.

On the basis of 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

A Procedure Change Approval Form (PCAF) has been issued to procedure ON-283-001 identifying the condition of the acoustic monitor for the "S" SRV and identifying the Suppression Pool Temperature Monitoring channels that are located most closely to its discharge line. High temperature at the Suppression Pool Temperature Monitoring channels will provide specific indication of a discharge of steam through the "S" SRV.

NO SIGNIFICANT HAZARDS CONSIDERATIONS

The proposed change does not:

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

   The acoustic monitors do not affect the operation of the safety/relief valves. The valve functions safety-related Safety Function (TS 3.4.2), safety-related ADS function (six selected valves-TS 3.5.1) and non-safety related automatic and manual relief functions are independent of the acoustic monitoring function. No failure or misoperation of the acoustic monitoring system can affect the ability of these valves to perform their design functions.

   Failure of the acoustic monitoring system to actuate in the event of an actual valve actuation does not affect the consequences of that action. The consequences of an undetected SRV failure to close or to remain closed when desired or required is unacceptable; the purpose of the monitoring system is to increase the probability that a failure of the valve actuation mechanism is detected.

   Operation without this detection system will not significantly increase the plant vulnerability to the event. Operation without this detection system would also not create any condition where the reliability of the valve is reduced.

   The SSES IPE assigns a conservative 1% probability to the stuck open safety relief valve. This valve is specifically designed and specified for the intended function, and is operated and maintained in accordance with the requirements of the design. The lack of position monitoring will not affect the valve's ability to perform its intended operational and safety function.

   Operation without the SRV acoustic monitor will not affect the plant response to the stuck open relief valve at power or hot shutdown conditions. The stuck open SRV transient as analyzed in the Design Assessment Report (DAR) (Appendix I) indicates that the maximum pool transient temperature (185°F) does not approach the NUREG 0783 accepted limit (208°F bulk pool temperature). This is assured by using SPOTMOS in accordance with off normal procedure ON-283-001.

   SRV tail pipe temperature rise is a true early indication of SRV actuation and a reliable indication of closure. Alarms generated by this sensor will alert the operator to the open SRV and start the two minute period mandated by Technical Specification 3.4.2. The Suppression Pool Temperature Elements located closet to the "S" SRV discharge quencher will also indicate heat input to the pool from that line. Other indications can be used to infer an open relief valve and to confirm a closed valve (i.e., by demonstrating pressure integrity).

The probability of a Stuck Open SRV Event is not affected by the presence of position indication for the SRV. The ability to detect the stuck open SRV condition is adequately covered by the tail pipe temperature indication and secondary reactor vessel and steam cycle parameter indications, and will not result in an increase in the probability or consequences of an accident previously evaluated.

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

   The SRV Acoustic Monitor performs no control or active protective function other than indication. Failure or misoperation of this device will not cause an unanalyzed failure or misoperation of an engineering safety feature. Because of the diverse and redundant indication system described above, misoperation of this system will not cause the operator to take unanalyzed actions, nor will it cause the operator to commit errors of commission or omission, and as such will not create the possibility of a new or different type of accident.

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

   Operating without the "S" SRV position indication does not reduce the design or operating basis margin to safety. In the unlikely event that the "S" SRV should cycle, sufficient indication would be available to identify and mitigate the occurrence. Thus, this change has been demonstrated to have no safety significance and will result in no change to the margin of safety.

BASIS FOR EMERGENCY REQUEST

10CFR50.91 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 manner would result in ... prevention of either resumption of operation or of increase in power output...". As evidenced by the reference, Susquehanna SES Unit 2 could not resume operation and would have to be shutdown lacking intervention by the NRC based on the safety justification provided by PP&L.

Secondly, 10CFR50.91 require the licensee to "... explain why this emergency situation occurred and why it could not avoid this situation...". The failure of the "S" SRV acoustic monitor was an unanticipated failure of a component during the plant startup. Previous operations did not indicate a problem; repairs to the acoustic monitor can not be affected with the unit in startup or at power. The Commonwealth of Pennsylvania declared an energy emergency and the need for power was great. 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 bases of Susquehanna SES, in that adequate compensatory actions have been proposed to ensure the dependability of detecting a stuck open relief valve. Therefore, no environmental consequences that have not been previously considered are anticipated.

If you have any questions, please call Mr. C. T. Coddington at (610) 774-7915.

Very truly yours,

R. G. Byram

Attachments

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/BRP