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AUTH.NAME AUTHOR AFFILIATION
CURTIS,N.W. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
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SUBJECT: Provides justification for interim operation w/currently installed,Suppression pool temp monitoring sys (SPOTMOS) resistance temp detector device,Multiple sensor failures disabling SPOTMOS unlikely to occur during normal operation.

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AUTH.NAME AUTHOR AFFILIATION
[illegible] Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
[illegible] Licensing Branch 2

SUBJECT: Provides justification for interim operation w/currently installed suppression pool temp monitoring sys (SPOTMOS) resistance temp detector device. Multiple sensor failures w/SPOTMOS unlikely to occur during normal operation.

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PP&L Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Norman W. Curtis
Vice President-Engineering & Construction-Nuclear
215 / 770-5381

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Mr. A. Schwencer, Chief
Licensing Branch No. 2
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
ENVIRONMENTAL QUALIFICATION - SPOTMOS RTD's
ER-100450 File 843
PLA-1433 Docket No. 50-387

Dear Mr. Schwencer:

This letter provides an updated justification for interim operation with the currently installed Suppression Pool Temperature Monitoring System (SPOTMOS) RTD configuration.

SPOTMOS is a divisionalized mircoprocessor based system consisting of 20 sensors with eight RTD's per division located just below the pool surface and four RTD's assigned to one division located near the bottom of the pool. There is one electronics package per division located in a control room back row panel, and 1 remote control station per division located in a control room inner ring panel.

Table 3.3.7.5-1 and Section 3.6.2.1 of the SSES Technical Specifications allow for continued operation of the plant down to six RTD's (1 per location) or 4 pairs of RTD's whichever is more limiting.

The currently installed SPOTMOS RTD configuration failed twice during the SRV fatique testing portion of the NUREG-0588 Category I Environmental Qualification Testing. The failure during the first test occurred approximately 45 minutes into the vibration testing phase. The failure during the second test occurred after approximately two minutes into the vibration testing phase. In both instances the ceramic sheath around the leads to the RTD platinum element powdered, and the leads opened. It is conceivable that the failed leads could short.

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The tests indicated that, despite the common cause of the failure, the failure due to SRV loads is not catastrophic in nature. Rather, the failure is the result of time dependent vibration induced action that proceeds at widely varying rates. Whether the failure is an open or a short, the system will detect it as a temperature indication that is more than 15 F from the average and also as either an upscale or downscale indication, all of which will result in SPOTMOS indicating an error.

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During normal operation, the purpose of SPOTMOS is to ensure operator action prior to the pool exceeding specified temperature limits. Prior to failure of more than three averaging RTD's per division, SPOTMOS' averaging capability will satisfy this need. If more than three averaging RTD's in a division are out, the operator can determine an average by examination of the individual temperature indications.

The system is such that down to the technical specification minimum number of sensors, the operator is provided with sufficient pool temperature information to initiate actions required by the technical specification. The situation that is not addressed is a multiple failure with the resulting number of sensors remaining functional being less than technical specification minimums. While the testing indicates that, during normal operation, this kind of failure is not likely to occur, it is necessary to address this situation.

With there being less than the technical specification minimum number of sensors available, SPOTMOS will not determine a meaningful suppression pool bulk average temperature; however, the operator will be made aware of the degraded condition by the SPOTMOS electronics error alarm function. Then the operator can take appropriate corrective action.

SPOTMOS also serves as a post accident monitor. In this instance, the ability of the operator to determine a true bulk average temperature is not as critical as determining that steam suppression and reactor depressurization has taken place. In this situation, it is only necessary to keep the pool temperature below the point where boiling will take place in order not to affect ECCS pumps due to NPSH reductions. In this situation, a small number of SPOTMOS RTD's or the Non-Q RHR pump suction indication, if it is available, should be sufficient. If, however, pool temperature cannot be determined, action must be taken based on the assumption that pool temperature is approaching allowable limits. These actions must continue until a method of determining pool temperature is achieved.

In conclusion:

1. It is not likely that multiple sensor failures that would disable SPOTMOS will occur during normal operation.

2. If multiple failures were to occur the qualified SPOTMOS electronic controls will alert the operator and the following will take place:

   a If the number of sensors available is equal to or greater than the minimum allowed by the technical specification, the pool temperature can be determined and the plant operated safely using existing equipment and procedures.

   b. If less than the minimum number of sensors allowed by technical specification are available with the reactor critical but in stable, steady state normal operation,

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without heat being added to the pool, plant safety is assured by compliance with the appropriate LCO action statement.

c. If less than the minimum number of sensors allowed by the Technical Specifications are available with the reactor critical but with heat being added to the suppression pool, the plant will remain safe if the operator takes action to halt the operation of those systems adding heat to the pool, initiates suppression pool cooling, and proceeds to cold shutdown per the appropriate LCO action statement.

In the event of a stuck open relief valve, the plant will remain safe if the operator takes actions, based on existing procedures, to scram and depressurize reactor if the valve cannot be closed within two minutes.

A modified RTD configuration has undergone testing and has successfully completed the SRV fatique testing phase of the environmental qualification testing program. The modified configuration has also successfully completed qualification testing for combined seismic, LOCA, and SRV dynamics. Additional testing continues for LOCA and post-LOCA environmental conditions. It is anticipated that qualified equipment will be in place by the end of the first refueling outage. It is our belief based on the above discussion that it is safe to operate the plant with the installed SPOTMOS RTD configuration until the end of the first refueling outage.

Very truly yours,

N. W. Curtis

Vice President - Engineering & Construction - Nuclear

cc: R. L. Perch
H. Garg