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SUBJECT: Forwards response to violations noted in insp repts 50-387/98-09 & 50-388/98-09.Corrective actions:Calculation EC-THYD-1035 confirms that following EOPs when shutting down units with ADS & core spray in event of App R.

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SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO NRC FIRE PROTECTION FUNCTIONAL INSPECTION
NRC INSPECTION REPORT NOS. 50-387/98-09 & 50-388/98-09 **Docket Nos. 50-387**
PLA-5016 **and 50-388**

Attached to this letter is PP&L, Inc. response to the Notice of Violation 98-09-A. This notice of violation was provided to PP&L in the NRC Special Inspection Report Nos. 50-387/98-09 and 50-388/98-09 dated October 19, 1998. This inspection report was issued as a follow up to evaluate the findings from the Fire Protection Functional Inspection (FPFI) performed at the Susquehanna Steam Electric Station (SSES) from October 20-24, and from November 3-7, 1997. The purpose of this inspection report was to determine if any enforcement action was appropriate for the FPFI findings.

If you have any questions on this response, please contact Mr. J. M. Kenny at (610) 774-7535.

Sincerely,

R.G. Byram

Attachment

copy: Regional Administrator - Region I
Mr. S.L. Hansell, NRC Acting Sr. Resident Inspector
Mr. V. Nerses, NRC Sr. Project Manager

REPLY TO NOTICE OF VIOLATION
VIOLATION A
INSPECTION REPORT NOS. 50-387/98-09 AND 50-388/98-09

Restatement of the Violation

License Condition 2.C(6) of operating license NPF-14 (Unit 1) and License Condition 2.C(3) of operating license NPF-22 (Unit 2) require PP&L to implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Review Report (FPRR) for the facilities and as approved by the NRC safety evaluation report (SER) dated August 9, 1989.

A. The FPRR, Section 3.0, Safe Shutdown Analysis, subsection 3.2.1, Appendix R Section III.G, states, in part, "The reactor coolant makeup function maintains the reactor water level above the top of active fuel, as detailed in Deviation Request No. 33."

FPRR Appendix R Deviation Request No. 33, Reactor Coolant Makeup and Depressurization Systems, states, under Justification: "For the PP&L Appendix R analysis, shutdown is achieved utilizing standard, emergency operating procedures where degraded modes can result from any cause including a postulated Appendix R fire." It further states, "The performance goal of the shutdown function will be met, i.e., the reactor coolant makeup function will be capable of maintaining the reactor coolant level above the top of the core . . ."

Contrary to the above, as of July 31, 1998, the shutdown methodology would not have maintained the indicated reactor vessel water level above the top of the active fuel (TAF) during a postulated Appendix R fire. Specifically, calculation EC-013-0509, Rev. 1, "Minimum Reactor Water level Under Spurious SRV Operation During a Control Room fire," dated May 31, 1994, showed that the core will be uncovered for up to one and one-half hours in the case of spurious opening of one or two safety relief valves by a hot short. Calculation EC-THYD-1035, Rev. 1, "In-Shroud Response for a Boildown Transient with ADS at TAF," dated January 28, 1998, calculated that the minimum water level for the case of automatic initiation of Automatic Depressurization System (ADS) at -129" will be 52 inches below the top of the active fuel. For the case of operators conforming to Emergency Operating Procedures, and manually initiating ADS at -161", the minimum water level will be 84 inches below the top of active fuel.

Reason for Violation

PP&L does not contest the Violation. As discussed below, the reason for the Violation was a difference of interpretation between PP&L and the NRC on the meaning of the requirement to maintain the level of the coolant above the top of the core. A lack of clarity in the FPRR also contributed to the violation.

- Safety Significance - The difference in interpretation relative to the meaning of maintaining level above the top of the core has been evaluated for safety significance. PP&L has determined that there is no measurable difference in the peak clad temperature (PCT) of the fuel when downcomer water level is maintained above the top of active fuel (TAF) versus maintaining the level of the coolant in the core above the top of the core. In either case there will be no fuel clad damage, no rupture of any reactor coolant pressure boundary and no rupture of the containment boundary. In either case, the PCT will be no worse than experienced during a normal loss of a.c. power. Based on this, PP&L does not believe that this violation has any appreciable impact on the safe operation of Susquehanna SES.

- Calculations - The following provides PP&L's perspective on the two calculations cited in the violation.

  Calculation EC-013-0509 - The purpose of Calculation EC-013-0509 was to determine if operator actions were necessary to mitigate the effects of spurious opening of safety relief valves (SRVs). The calculation determined that automatic functioning of the low pressure Core Spray (CS) would not be effective in maintaining the reactor water level above TAF for the case of a fire induced spurious opening of one or two SRVs. This calculation, however, also concluded that manual operator actions to further depressurize the reactor and inject with CS would be effective in mitigating the effects of the fire induced spurious opening of the SRVs. In the 1989 time frame, PP&L modified Off Normal Fire Procedure ON-013-001 to provide for these operator actions. This calculation and the procedural actions included into Procedure ON-013-001 assured that the operator was given adequate direction to take appropriate actions in response to the effects of fire induced spurious SRV events.

  Calculation EC-THYD-1035

  Calculation EC-THYD-1035 was prepared to demonstrate that the ADS and Core Spray shutdown methodology used for safe shutdown paths 1 and 3 at SSES meets licensing basis requirements. Calculation EC-THYD-1035 concluded that, when using ADS and core spray and following the EOPs, the coolant level in the reactor core region, which consists of a two-phase mixture of steam and water, would not drop below the top of the core. Specifically, the calculation determined that the void fraction within the core during the event would range from approximately 0.4 to 0.8. This is comparable to the core exit void fraction of approximately 0.7 for the reactor coolant during normal plant operation. Therefore, the peak clad temperature (PCT) of the fuel would be comparable to the PCT of the fuel during normal plant operation. This calculation, however, also determined that the indicated water level in the downcomer region would be below TAF when using ADS and Core Spray.

PP&L has determined that the results of this calculation relative to the coolant level in the core are consistent with PP&L's intent in preparing and submitting Deviation Request No. 33 in the FPRR. Deviation 33 states that the ADS/CS "will be capable of maintaining the reactor *coolant* level above the top of the core." However, Section 3.2.1 of the FPRR states that the ADS/CS "maintains the reactor *water* level above the top of active fuel as detailed in Deviation Request No. 33." Therefore, PP&L concludes that Section 3.2.1 of the FPRR is imprecise and potentially inconsistent relative to Deviation Request No. 33.

Corrective Steps Taken and Results Achieved

Calculation EC-THYD-1035 confirms that following the EOPs when shutting down the units with ADS and Core Spray in the event of an Appendix R fire will assure that the level of the coolant is always maintained above the top of the core. This will prevent any fuel clad damage, rupture of the reactor coolant pressure boundary and rupture of the primary containment. However, in order to ensure that downcomer water level is always maintained above TAF, PP&L will implement the further steps described below.

Corrective Steps to Avoid Future Violations

PP&L will perform a study to determine the efficacy of revising the minimum water level for operator initiation of ADS such that downcomer water level remains above TAF. Upon confirmation that the revised minimum water level meets all pertinent requirements, PP&L will initiate appropriate revisions to plant procedures, engineering documentation, and licensing documentation, and will implement the requisite operator training.

Date When Full Compliance Will Be Achieved

PP&L will complete the study described above and inform the NRC Sr. Resident Inspector of the results by July 1, 1999. At that time, based on the study results, PP&L will provide the Inspector with our schedule for either completion of the follow-up actions described above, or with an alternate course of action to achieve full compliance.