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SUBJECT: Responds to RAI re loss of spent fuel pool cooling initiated by design basis seismic event.

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**JUN 01 1994**

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**SUSQUEHANNA STEAM ELECTRIC STATION  
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION  
CONCERNING LOSS OF SPENT FUEL POOL COOLING INITIATED  
BY THE DESIGN BASIS SEISMIC EVENT  
PLA-4145**

Docket Nos. 50-387  
and 50-388

**FILE R41-2**

- References:*
- 1) *NRC Letter, C. L. Miller to R. G. Byram "Request for Additional Information (RAI) concerning Loss of Spent Fuel Pool Cooling Initiated by the Design Basis Seismic Event, Susquehanna Steam Electric Station, Units 1 and 2 (TAC NO. M85337)," dated May 19, 1994.*
  - 2) *PLA-4128, R.G. Byram to C.L. Miller "Follow-up Response to Request for Additional Information Concerning Standby Gas Treatment System," dated April 29, 1994.*
  - 3) *PLA-4133, R. G. Byram to C. L. Miller "Additional Information in Response to 3/7/94 NRC Request Regarding Evaluation of SGTS Under Seismic Conditions," dated May 4, 1994.*
  - 4) *PLA-4134, R. G. Byram to C. L. Miller "Response to Request for Additional Information Concerning Loss of Spent Fuel Pool Cooling," dated May 5, 1994.*

Dear Mr. Miller:

Pennsylvania Power and Light Company (PP&L) has been requested (Ref.1) to provide additional information regarding the capabilities of the Susquehanna Steam Electric Station (SSES) to mitigate the effects of a loss of spent fuel pool (SFP) cooling initiated by the design basis seismic event. The purpose of this letter is to address this request for additional information by committing to actions which will prevent SFP boiling.

***Commitment to Remove Fuel Pool to Cask Storage Pit Gates During Normal Operation***

PP&L has decided to normally operate SSES with the fuel pool to cask storage pit gates removed, thereby crosstying the SSES Unit 1 and Unit 2 spent fuel pools. Maintaining the fuel pools crosstied through the cask storage pit is desirable for the following reasons:

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- Time to boil in a loss of fuel pool cooling event is increased for the pool with the highest heat load. This provides additional time to take actions to re-establish pool cooling and prevent pool boiling.
- With the pools crosstied, either unit's cooling systems (normal spent fuel pool cooling, if available, otherwise RHR in fuel pool cooling mode) can be used to cool both pools. This doubles the number of systems that could be used to prevent pool boiling, and mitigates concerns regarding potential single failures.
- Prevention of pool boiling eliminates any potential challenge to the Standby Gas Treatment System (SGTS).
- Since boiling will not occur, procedural changes under consideration to vent the refueling floor under certain conditions (ref. 3) will no longer be required.

Make-up for evaporative losses would continue to be provided by Condensate Transfer and the seismic Category I Emergency Service Water (ESW) system.

Our decision to normally operate with the Fuel Pool to Cask Storage Pit Gates removed was made following resolution of concerns regarding the potential for draindown. During the ongoing Unit 2 refueling and inspection outage, PP&L is installing additional drainage barriers (e.g., spectacle flanges and repositioning of valves) to resolve this issue.

This change will be effective, upon completion of ongoing physical modifications, procedure changes and associated safety evaluations, by June 30, 1994.

#### *Infrequent Operation with Fuel Pool Gates Installed*

This change, however, does not preclude the installation of the gates for specific, infrequent plant evolutions such as transfer of fuel into fuel casks for storage. Under these conditions, adequate SFP cooling will be maintained if a design basis seismic event were to occur while in this configuration. Sufficient time will exist for either restoration of the normal SFP cooling system or utilizing Seismic Class I connections to the safety-related, emergency diesel generator backed RHR system in the fuel pool cooling mode of operation. Procedural guidance for responding to a loss of SFP cooling is contained in Off-Normal and Emergency Plan procedures.



### *Administrative Controls for Controlling Onset of Boiling*

SSES FSAR Appendix 9A evaluates a hypothetical sequence of events to assess the worst case offsite dose that could result from a fuel pool boil. It determines that the offsite dose consequences are negligible. The FSAR Appendix 9A identifies that SSES will operate the fuel pools such that a 25 hour time to boil minimum will always be maintained.

When a full core offload is performed the fuel pool heat load is at it's highest as the majority of the pool heat load is due to the offloaded fuel bundles. The pool volume as compared to the pool heat load considering SSES operating schedules and practices is such that only during the full core offload condition is the 25 hour time limit approached.

Administrative controls are implemented in order to maintain the 25 hour limit. SSES outages have been evaluated to determine the time to boil as a function of the outage schedule to assure the 25 hour limit is maintained by the schedule. Formal engineering assessments of the refueling outages occurring in the fall of 1993 and spring of 1994 were performed prior to each outage. Schedule changes during the outages have been assessed to assure the 25 hour limit would not be affected. The SSES fuel pools have been operated such that the 25 hour time to boil limit was maintained. During Service water outage periods, a separate procedure is implemented to closely monitor and control Fuel Pool temperatures.

The process of evaluating and assessing the outage schedule prior to the outage and assessing desired changes to that schedule during the course of the outage as implemented during the fall and spring outages described above will be formally incorporated into appropriate procedures by June 30, 1994.

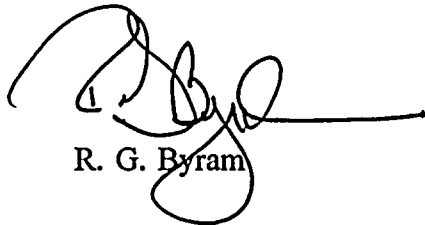
### *Conclusion*

1. PP&L is confident that should a seismic event or the scenario presented in the Part 21 report occur at SSES, ample time will be available to restore cooling. Cooling can be restored to an isolated SFP through the restoration of the normal SFP cooling system or manual alignment of the RHR system in fuel pool cooling assist mode as documented in our previous submittals. The analysis presented in FSAR Appendix 9A was performed with the specific intent of providing a bounding offsite dose scenario, and therefore assumed the pool would boil; this was not mechanistic. We are confident that boiling can be prevented under these conditions.
2. The offsite dose analysis presented in Reference 3 clearly indicate that the actual radiological consequences of a seismic event-initiated loss of SFP cooling are quite low. Therefore, PP&L maintains, consistent with previous submittals (Ref. 2), that the need for SGTS to mitigate the consequences of a boiling pool appears questionable.

PP&L has determined that normal operation with the pools crosstied will enhance the margin of safety against SFP boiling, and has decided to implement the change.

We are available to discuss this submittal with you in greater detail at your convenience. Questions should be directed to Mr. J. M. Kenny at (610) 774-7904.

Very truly yours,



R. G. Byram

cc: NRC Document Control Desk (original)  
NRC Region I  
Mr. G. S. Barber, NRC Sr. Resident Inspector  
Mr. C. Poslusny, Jr., NRC Project Manager

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