



AUG 13 2009

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Stop OP1-17  
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
UNIT 2 OPERATING LICENSE NO. NPF-22  
LICENSE CONDITION 2.C. (21) (a)  
PLA-6545**

**Docket No. 50-388**

- References:* 1.) PLA-6451, W. H. Spence (PPL) to Document Control Desk (USNRC),  
"Unit 1 Operating License No. NPF-14 License Conditions 2.C. (37) (a) and  
2.C. (37) (b) and Unit 2 Operating License No. NPF-22 License Conditions 2.C. (21) (a)  
and 2.C. (21) (b)," dated November 18, 2008.
- 2.) PLA-6481, W. H. Spence (PPL) to Document Control Desk (USNRC),  
"Unit 1 Operating License No. NPF-14 License Conditions 2.C. (37) (a) and  
2.C. (37) (b) and Unit 2 Operating License No. NPF-22 License Conditions 2.C. (21) (a)  
and 2.C. (21) (b) Supplement to PLA-6451 Re: Response to RAI's," dated April 13, 2009.

The purpose of this letter is to provide information related to the condensate pump trip test performed on Susquehanna Steam Electric Station (SSES), Unit 2 on June 12, 2009. This test was performed to comply with Unit 2 License Condition (LC) 2.C.(21)(a) which states:

PPL will demonstrate through performance of transient testing on each SSES unit that the loss of one condensate pump will not result in a complete loss of reactor feedwater. The test shall be performed on each unit during the unit's CPPU power ascension test program within 336 hours of achieving and prior to exceeding a nominal power level of 3733 MWt with feedwater and condensate flow rates stabilized. PPL shall confirm that the plant response to the transient is as expected in accordance with the acceptance criteria that are established. If a loss of all reactor feedwater occurs as a result of the test, the test failure shall be addressed in accordance with corrective action program requirements and the provisions of the power ascension test program prior to continued operation of the SSES Unit above 3489 MWt.

The test was initiated from a core power of 3729 MWt (94.4%) with the Unit 2 "A" condensate pump tripped to start the test. Tripping this condensate pump initiated a reactor recirculation runback as designed. The condensate pump trip caused an immediate drop in feedwater flow, which caused the initial reactor water level to decrease. Reactor water level decreased approximately 1 inch to a minimum indicated

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level of 34 inches. Reactor Feedwater Pump (RFP) suction pressure decreased from an initial pressure of 416 psig to a minimum of 327 psig due to the loss of the condensate pump and the subsequent increase in feedwater demand. The increased feedwater demand caused the RFP speed to increase to a maximum of 4999 rpm. The RFP suction pressure recovered as feedwater demand began to decrease. Feedwater demand decreased as core power decreased because of the initiation of the recirculation runback. Core power reached a final steady state value of 2656 MWt (67.2%).

Note that the new Unit 2 condensate filter and demineralizer modification was not in service for the test, contrary to PPL's response to NRC RAI-1 in Reference 2. This equipment would have resulted in additional suction pressure margin.

All test acceptance criteria were met (see the Attachment to this letter). The conservative RFP suction pressure prediction of the simulator and static analysis validate the use of these tools to predict the results of a condensate pump trip at 3952 MWt, similar to the Unit 1 results described in Reference 1.

As described in Reference 2, the next condensate pump trip test is planned for startup following the Unit 1 Refueling Outage in 2010. This test will be performed after installation of the Integrated Control System (ICS) and new reactor feed pump turbines. This test will be performed at 3733 MWt unless NRC determines it is necessary to perform a condensate pump trip test between 3872 MWt and 3952 MWt to meet License Conditions 2.C.(37)(b) for Unit 1 and 2.C.(21)(b) for Unit 2.

This test result provides further evidence that the static analysis and simulator results predict conservative system response such that it is not warranted that a condensate pump trip test be performed between 3872 MWt and 3952 MWt. The Unit 1 test in 2010 at 3733 MWt is expected to similarly demonstrate that the static analysis and simulation results remain valid for 3952 MWt and that a complete loss of feedwater will not occur.

Any questions regarding this letter should be directed to Mr. Duane L. Filchner at (610) 774-7819.



T. S. Rausch

Attachment: Unit 2 Condensate Pump Trip Acceptance Criteria and Results

Copy: NRC Region I  
Mr. R. R. Janati, DEP/BRP  
Mr. F. W. Jaxheimer, NRC Sr. Resident Inspector  
Mr. B. K. Vaidya, NRC Project Manager

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**Attachment to PLA-6545**

**Unit 2 Condensate Pump Trip  
Acceptance Criteria and Results**

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## **Unit 2 Condensate Pump Trip Test from 3729 MWt**

### **Condensate Pump Trip Acceptance Criteria**

Level 1 Criteria - The trip of one condensate pump shall not cause the trip of all three feedwater pumps.

Level 2 Criteria:

- (a) The trip of one condensate pump shall not cause the trip of more than one feedwater pump.
- (b) A recirculation runback shall occur upon the trip of a condensate pump.
- (c) For the 3733 MWt test only, the margin to the RFP suction pressure trip setpoint shall not be less than 10 psi.

### **Results - All Test Acceptance Criteria were Met**

Level 1 Criteria – No feedwater pumps tripped.

Level 2 Criteria:

- (a) No feedwater pumps tripped.
- (b) A recirculation runback did occur.
- (c) Margin to RFP suction pressure trip:  $(327 \text{ psig} - 285 \text{ psig}) = 42 \text{ psi}$ , or 32 psi above the Level 2 acceptance criteria.