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SUBJECT: Forwards Rev 1 to "Control Sys Power Supply & Sensor Malfunction Study." Existing sys adequately controls facility.

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OCT 14 1983

Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
CONTROL SYSTEM POWER SUPPLY AND
SENSOR MALFUNCTION STUDY
ER 100450 FILE 841-2
PLA-1894 Docket No. 50-387

Dear Mr. Schwencer:

As requested by your Staff, enclosed is a copy of the report entitled "Control System Power Supply and Sensor Malfunction Study" for Susquehanna SES Unit 1. As stated in our previous letter, PLA-1733 dated July 7, 1983,:

> "A review was conducted to identify any power sources or sensors which provide power or signals to two or more control systems, and to demonstrate that failures or malfunctions of these power sources or sensors will not result in consequences outside the bounds of the Chapter 15 analyses or beyond the capability of operators or safety systems. PP&L has completed this study and has found no failures which result in consequences not bounded by Chapter 15 or are not within the capabilities of the operator or safety systems.
>
> The study did identify one commonality which requested detailed analysis. It was found that if bus 1D635 were lost the B feedwater flow instrument would indicate no flow in that feedwater path. This would result in a high reactor water level due to a false feedwater flow vs. steam flow mismatch. If the reactor water level were to increase past the Level 8 trip a main turbine and reactor feed pump turbine (RFPT) trip should occur followed by a subsequent reactor trip. The study indicated that RFPT "C" would not trip since bus 1D635 also powers the trip circuit for that pump turbine. In order to analyze this condition a RETRAN computer code was used to simulate this condition. The following summarizes the results of bus 1D635 failing.
>
> The first RETRAN run was performed simulating the loss of one feedwater flow element. This run indicated that the reactor water level would rise to 53.3 inches in 50 seconds and them become stable. While this level is below the 54 inch Level 8 setpoint it is close enough that normal

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instrument drift could cause trips. A second RETRAN run was done to examine the effects of a Level 8 trip. The code was modified to force a trip at 53.3 inches and to force a minimum feedwater injection rate of 25%. This transient run indicated that the event is bounded by FSAR Chapter 15 events for thermal limit considerations, and therefore does not violate the safety limit CPR. The run did show a steadily increasing water level due to the 25% assumed feedwater injection rate. This assumption later proved to be incorrect and over conservative. This is due to the fact that when the "B" RFPT trips the false feedwater flow vs. steam flow mismatch is corrected and the feedwater controller will attempt to control reactor water level to the controller setpoint. Even with a feedwater pump running the controller has the ability to terminate feedwater injection. Actual feedwater injection will terminate at approximately 70 to 90 seconds after the turbine trip. This results from a feedwater controller setpoint setback to 18 inches which is initiated by the low water level condition this transient produces. The RETRAN code did not model the setpoint setback feature of the feedwater controller.

The analysis summarized above shows that control system commonality found at bus 1D635 is bounded by the Chapter 15 analyses and that existing systems can adequately control the plant. The operator has more than adequate time to recover from this condition by manually tripping the "C" RFPT, which does not require bus 1D635, or by putting the pump in a startup feed path."

If you have any questions or comments, please contact us.

Very truly yours,

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

Enclosure

cc: R. L. Perch NRC