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AUTH. NAME: CURTIS, N.W.  
 AUTHORITY AFFILIATION: Pennsylvania Power & Light Co.  
 RECIP. NAME: SCHWENCER, A.  
 RECIPIENT AFFILIATION: Licensing Branch 2

SUBJECT: Forwards TR-5352A-1, "Executive Summary, Waterhammer Analysis for Susquehanna Units 1 & 2 Control Rod Drive Insert & Withdrawal Lines," per 8204050 request. Rept provides response to listed items 2, 4 & 5.

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Pennsylvania Power & Light Company

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Norman W. Curtis  
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215/770-7501

**JUL 06 1984**

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

SUSQUEHANNA STEAM ELECTRIC STATION  
HYDRODYNAMIC LOADS ON CRD PIPING  
ER 100450/100508 FILE 841-2  
PLA-2247

Docket Nos. 50-387  
50-388

Reference: (1) Letter from A. Schwencer to N. Curtis dated 4/5/82  
(2) PLA-1067 dated 4/19/82  
(3) PLA-1448 dated 12/22/82  
(4) PLA-1665 dated 5/16/83  
(5) PLA-2065 dated 2/8/84

Dear Mr. Schwencer:

This letter transmits our response to your letter on "Fast Scram" Hydrodynamic Loads on Control Rod Drive Systems (Reference (1)). Your letter requested the following information:

1. The design basis opening time for the inlet line scram valve.
2. An evaluation of the hydrodynamic loads in your CRD system resulting from actuation of the inlet line scram valve using the design basis opening time specified in Item 1.
3. A description of the conditions and configurations of the plant which result in the maximum hydrodynamic loads in the CRD system.
4. A statement regarding the appropriateness of the mathematical model used to calculate the hydrodynamic loads in the CRD system resulting from a scram.
5. A comparison of the hydrodynamic loads evaluated in Item 2 with the present design basis loads for the CRD system.

In order to address this issue, PP&L participated in a BWROG effort. This resulted in the development of a computer model to analyze the hydrodynamic loads on a plant specific basis and valve testing to determine the design

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2. The information contained herein is classified as [redacted] and is intended for the use of [redacted] only.

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PLA-2247

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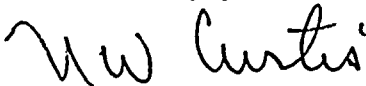
Mr. A. Schwencer

basis opening time for the inlet and outlet scram valves. The BWROG effort was completed in May 1983 and was presented to the NRC at that time. PP&L endorses the BWROG analyses.

Items 1 and 3 above have been addressed generically by the BWROG, and therefore will not be covered in this report. The attached report, TR-5352A-1, "Executive Summary for Waterhammer Analysis for Susquehanna Units 1 and 2 Control Rod Drive Insert and Withdrawal Lines," provides PP&L's response to items 2, 4 and 5 above. The results of the plant specific analysis indicate that the present design of the control Rod Drive (CRD) Insert/Withdrawal line supports is capable of withstanding the "Fast Scram" Hydrodynamic loads.

This letter completes PP&L's actions associated with "Fast Scram" Hydrodynamic Loads on Control Rod Drive Systems.

Very truly yours,



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

Attachment

cc: R. H. Jacobs - NRC  
R. L. Perch - NRC

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy auditing of the accounts.

In the second section, the author details the various methods used to collect and analyze data. This includes both primary and secondary research techniques. The primary research involves direct observation and interviews, while secondary research involves the use of existing data sources.

The third part of the document focuses on the statistical analysis of the collected data. It describes the use of various statistical tests to determine the significance of the findings. The results of these tests are presented in a clear and concise manner, allowing for a straightforward interpretation of the data.

Finally, the document concludes with a summary of the key findings and a discussion of their implications. It highlights the strengths and limitations of the study and provides recommendations for future research. The overall goal is to provide a comprehensive and reliable overview of the research findings.