



Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

50-387  
388

Norman W. Curtis  
Vice President-Engineering & Construction-Nuclear  
215 / 770-5381

May 21, 1982

Mr. R. C. Haynes  
Regional Administrator, Region I  
U. S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, Pennsylvania 19406

SUSQUEHANNA STEAM ELECTRIC STATION  
INTERIM REPORT OF A DEFICIENCY INVOLVING  
AC ELECTRIC DISTRIBUTION SYSTEM  
ERs 100450/100508 FILE 821-10  
PLA-1102

Dear Mr. Haynes:

This letter serves to provide the Commission with an interim report on a deficiency involving the capability of the AC electric distribution system to support two unit operation.

This deficiency was originally reported by telephone to Mr. E. C. McCabe of NRC Region I on April 20, 1982 by Mr. A. R. Sabol of PP&L. At that time, the condition was identified as "Potentially Reportable".

The attachment to this letter contains a description of the deficiency, its cause, an analysis of safety implications and the corrective action taken and planned. This information is furnished pursuant to the provisions of 10 CFR 50.55(e).

This report is to be considered the final report for the PP&L analysis of the AC electric distribution system to support Unit I operation.

PP&L anticipates providing the Commission with a final report addressing two unit operation in September, 1982.

Since the details of this report provide information relevant to the reporting requirements of 10 CFR 21, this correspondence is considered to also discharge any formal responsibility PP&L may have in compliance thereto.

8206010374<sub>5</sub>

IE27  
5/1

- 2 -

SSES

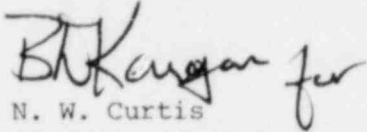
PLA-1102

ERs 100450/100508 File 821-10

Mr. R. C. Haynes

We trust the Commission will find this report to be satisfactory.

Very truly yours,



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

JS:sab

Attachment

cc: Mr. Richard C. DeYoung (15 copies)  
Director-Office of Inspection & Enforcement  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. G. McDonald, Director (1)  
Office of Management Information & Program Control  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. Gary Rhoads  
U. S. Nuclear Regulatory Commission  
P.O. Box 52  
Shickshinny, PA 18655

May 21, 1982

SSES PLA-1102  
ERs 100450/100508 File 821-10

Subject

AC Electric Distribution System

Description of Deficiency

The AC electric distribution system provides the power to operate and control equipment required for normal plant operation, for plant shutdown, and for mitigation of design basis accidents. This system was modelled, using computer based simulations, and studied to verify that the system meets design specifications.

Preliminary studies, completed February 12, 1982, indicated that, for two unit operation, minimum post-LOCA steady state voltage of 90.6% and minimum post-LOCA motor starting voltage of 81% would be observed if one startup transformer and one engineered safeguard transformer are out of service. These voltages correspond to design limits of 90.0% and 80.0% respectively.

On March 14, 1982 design voltage verification tests were conducted. The object of these tests was to verify that predicted voltage for test conditions match actual observed voltages.

If the observed voltages were found in disagreement with the calculation, the error was to be factored into the design base calculation to show that the design still met the voltage criteria. The outcome of the verification test was that predicted voltages exceeded observed voltages by as much as 3%. When this 3% discrepancy was factored into the design base voltage calculations (which initially considered only two unit operation), the following conclusions were reached:

- o The voltage design criteria for two unit operation were not met.
- o When the design base voltage calculations were revised for Unit 1 operation only, the voltage design criteria were met.

Analysis of Safety Implications

Continuous operation of motors at reduced voltage will result in motor overheating and accelerated loss of life. Starting of motors with less than minimum design voltage will result in increased starting times, increased heating during the start, and accelerated loss of life. The 480V motor starters used at Susquehanna SES require 90% bus voltage to operate. This leads to the conclusion that during two unit operation, even though motor operation may be possible, motor starter operation is uncertain and some safety related 480V motors (pumps, valves, fans, etc.) may not start when required.

PP&L has concluded that since design limits cannot be assured for two unit operation, this deficiency is reportable under the provisions of 10CFR50.55(e).

May 21, 1982

- 2 -

SSES

PLA-1102

ERs 100450/100508 File 821-10

### Cause of Deficiency

The most probable cause of this deficiency was the failure of Bechtel Power Corporation to include sufficient margins in their initial design calculations to account for equipment tolerances and computational inaccuracies.

### Corrective Action

Additional design voltage verification tests will be conducted. These tests will subject the AC electric distribution system to loads that are more representative of worst case design conditions. These tests will utilize additional instrumentation and be more comprehensive than the March 14, 1982 test.

The results of the forthcoming tests will be evaluated to determine if there are any further discrepancies between calculated and observed voltages. The discrepancies noted in the March 14, 1982 test will then be re-examined to reconcile any differences in the results of the two tests.

The additional voltage verification tests will be completed prior to the Unit 1 cold functional test. The analysis of the observed data will be completed by September 1, 1982 and the results will be addressed in our final report on the capability of the AC electric distribution system to support two unit operation.

To assure the safe operation of Unit 1 during construction of Unit II, a design change will be implemented so that a LOCA in Unit I will cause all safety-related Unit II loads that may be running for construction related activities, to trip and lock out. Until this modification is completed, all Unit II 4.16 KV incoming feeder breakers will be racked out-of-service. This will assure that adequate voltage is available for safety-related equipment in Unit I. This modification (Design Change Request #P0075RO) will be scheduled for completion by July 1, 1982.

PP&L is proceeding with the design effort to improve the voltage of the AC electric distribution system in the event the upcoming test confirms the 2 unit voltage design deficiency.

A final report will be prepared addressing the findings of the forthcoming design voltage verification tests and describing any additional corrective action which may be necessary.