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50-387

Norman W. Curtis
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June 18, 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
EMERGENCY SERVICE WATER (ESW) SYSTEM WATER HAMMER
ERs 100450/100508 FILE 821-10
PLA-1129

Dear Mr. Haynes:

This letter serves to provide the Commission with an interim report on the deficiency involving the potential for Water Hammer in the ESW System.

This condition was identified as "Potentially Reportable" to Mr. S. Ebneter of NRC Region I by Mr. A. R. Sabol of PP&L during a telephone conversation on May 5, 1982. PP&L now considers this condition to be reportable under the provisions of 10CFR50.55(e).

The attachment to this letter contains a description of the deficiency, its cause, and safety impact. The corrective action is presently being analyzed.

As discussed in the attached report, the adverse safety impact of the ESW System Water Hammer will exist only after initial criticality. The licensing implications of not completing the corrective actions prior to fuel load will be discussed with NRR.

PP&L expects to provide the Commission with a final report one week before initial criticality.

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

Very truly yours,

B. Kenyon for

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

BMS:JS:pd
Attachment

IE27

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

Mr. G. McDonald, Director
Office of Management Information & Program Control
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Mr. Gary Rhoads
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Mr. R. Perch
Project Manager
U.S. Nuclear Regulatory Commission
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INTERIM REPORT

Subject:

Water hammer in the Emergency Service Water System

Description of Deficiency:

During preoperational testing at Susquehanna Steam Electric Station, a water hammer occurred in the ESW System which resulted in damage to three pipe hangers. An investigation into the cause of the hanger failures revealed that there are certain operating and test conditions under which the ESW System would be subjected to water hammer.

The water hammer occurs as a result of the following sequence of events:

(1) ESW System in operation - ESW pumps are on, 36" Motor Operated Bypass Valves to spray pond are open.

(2) Loss of Offsite Power (LOOP) occurs - pumps shut down, 36" MOVs remain open; ESW piping begins to drain to spray pond.

(3) Power supply transfers from offsite to emergency (i.e. diesel generators)

(4) 10 seconds after diesel generator initiation - 36" valves begin to close, drainage to spray pond continues during valve closure. (Closing time of valves is nominally 30 seconds.)

(5) 55 seconds after diesel generator initiation - ESW pumps restart.

The pump restart causes water to be discharged into the partially emptied ESW piping, thereby resulting in a water hammer. Consequently, the potential exists for the ESW System to be degraded as a result of water hammer loads.

Cause of Deficiency:

FSAR Section 9.2.5 describes the ESW System. This section requires that the ESW System have the capability, during plant power generation, to be tested through the full operational sequence that brings the system into operation including the transfer between normal and emergency power sources.

The existing ESW System design has not considered the LOOP scenario described above. Consequently, the water hammer loads that result from a LOOP, and which may be in excess of other design loads, have not been factored into the final design.

Safety Impact:

Water hammer may cause degradation of the ESW System. If the ESW System degrades, the safe shutdown of the plant could be compromised. The safety function of the ESW System is the removal of heat from the ECCS equipment and the diesel generators. The loss of this heat removal capability will have an adverse affect on plant safety only after initial criticality.

PP&L considers this condition to be reportable under the provisions of 10CFR50.55(e).

Corrective Action:

Corrective action has not yet been established. PP&L and Bechtel are reviewing the condition and developing a corrective action plan which will eliminate the problem associated with water hammer in the ESW System.