



Pennsylvania Power & Light Company

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EL-0029

50.55(e)

50-387  
50-388

Norman W. Curtis  
Vice President-Engineering & Construction-Nuclear  
215 / 770-5321

November 5, 1981

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

SUSQUEHANNA STEAM ELECTRIC STATION  
INTERIM REPORT OF A DEFICIENCY INVOLVING  
ISOLATION MOTOR GENERATOR SETS  
ERs 100450/100508 FILE 821-10  
PLA-950



Dear Mr. Haynes:

This letter serves to provide the Commission with an interim report of a deficiency involving the 480 volt motor generator set relaying scheme. Under certain accident conditions, electrical power to the low pressure coolant injection swing bus might be interrupted due to design features of the motor generator set. The deficiency was originally reported under the provisions of 10 CFR 50.55(e) in a telephone conversation between Mr. A. Sabol of PP&L and Mr. L. Narrow of NRC Region I on September 21, 1981.

The attachment to this letter contains a description of the deficiency, its cause, safety implications and the corrective action under consideration.

We trust the Commission will find this report to be satisfactory. We expect to issue a final report in January, 1982.

Very truly yours,

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

FLW:sab

Attachment

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Mr. R. C. Haynes

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November 5, 1981

cc: Mr. Victor Stello (15)  
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

SUBJECT

Loss of electrical power to Emergency Core Cooling System motor operated valves.

DESCRIPTION OF DEFICIENCY

Under a LOCA condition accompanied by a loss of offsite power (LOOP), the 480 volt motor-generator (MG) sets used to provide electrical isolation for the Low Pressure Coolant Injection System (LPCI) motor operated valves could be tripped and locked out by underfrequency relaying before the diesel generators are capable of restoring power to maintain operation of these MG sets.

Referring to Figure 1 (last page of this report), it can be seen that, if:

- offsite power is lost,
- an MG set trips and locks out,
- diesel generator 'C' fails,

power will be unavailable at the 480 volt swing bus.

ANALYSIS OF SAFETY IMPLICATIONS

Each SSES unit has two 480 volt LPCI swing buses. Each swing bus supplies power to four valve operators which might be required during a design basis Loss of Coolant Accident (LOCA).

The 480 volt LPCI swing bus is designed to meet the minimum Emergency Core Cooling System (ECCS) criteria, assuming a total LOOP and a single failure (e.g., diesel generator failure to start). The minimum ECCS criteria for a double ended recirculation suction line break is: a) one LPCI loop and two core spray (CS) loops or b) one LPCI pump in each loop and one CS loop.

The present design of the relay scheme for protecting the LPCI swing bus MG sets could trip the preferred source of power to the bus. If the diesel generator which provides the alternate power source fails to start, the swing bus would remain de-energized. The valves powered from that bus would be inoperable. Since one CS pump would be lost as a result of the diesel failure to start, one CS loop would be unavailable. Therefore, the minimum ECCS criteria could not be met in the accident postulated and adequate core cooling could not be assured.

PP&L has concluded that the LPCI MG set underfrequency trip relay scheme could lead to an inability to meet minimum ECCS criteria and is therefore a significant design deficiency. The deficiency could have adversely affected safe plant operation and is therefore reportable under 10 CFR 50.55(e).

CORRECTIVE ACTION PLANNED

Corrective action to insure that the minimum ECCS requirements are maintained during design basis accidents is now under review.

The possibility of increasing the time delay on the 480V isolation MG set under-frequency relays is being investigated. The proposed delay would prevent tripping the subject MG sets before the MG sets have re-accelerated.

The corrective action taken will be detailed in our final report on the deficiency.

FIG. 1 M/G SET & SWING BUS

