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FEB 27 1984

Dr. Thomas E. Murley
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U.S. Nuclear Regulatory Commission
631 Park Avenue
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SUSQUEHANNA STEAM ELECTRIC STATION
FINAL REPORT ON A DEFICIENCY INVOLVING
SPDS TEC MODEL 156 ISOLATORS
ER 100508 FILE 821-10
PLA-2089

Docket No. 50-388

Reference: (1) PLA-2063 dated 2/06/84

Dear Dr. Murley:

This letter serves to provide the Commission with a final report on a deficiency involving SPDS TEC Model 156 isolators. This deficiency was reported under 10CFR50.55(e) by telephone to Mr. G. Kelley of NRC Region I by Mr. J. Saranga of PP&L on January 6, 1984.

The attachment to this letter contains a description of the problem, the safety implications, and the corrective actions. This deficiency was addressed for Unit 1 in PLA-2070 dated 2/03/84 (LER 84-003).

Since the details of this report provide information relevant to the reporting requirements of 10CFR21 for Unit 2, this correspondence is considered to also discharge any formal responsibility PP&L may have for reporting in compliance thereto.

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

Very truly yours,

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

Attachment

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Dr. Thomas E. Murley

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FINAL REPORT

Attachment to PLA-2089

SUBJECT

Technology for Energy Corporation Model 156 isolators procured under Bechtel Purchase Order 8856-J-049-AL do not meet the requirements of the purchase specification which calls for separation of the power source from both the input and output signal connections. Two instances have been identified where a Class 1E power source is used resulting in a violation in separation requirements.

DESCRIPTION

The safety parameter display system (SPDS) and the interim emergency response computer system (ERCS) (both non-1E) require input from safety related systems. To provide separation for the safety related systems, TEC Model 156 isolators were purchased and installed. The purchase order for these isolators required a minimum isolation of 600 VAC or 1000 VDC between the input, output, and power supply circuits. After the installation of the isolators, it was discovered that the power supply circuit was directly connected to the output circuit. Consequently, use of the isolator in cabinets with 1E power results in connection of a 1E source to a non-1E circuit. Two cases have been identified where a Class-1E power supply was used for the isolator:

1. average power range monitor (APRM) inputs to SPDS
2. high pressure coolant injection (HPCI) inputs to interim ERCS

ANALYSIS OF SAFETY IMPLICATIONS

The configuration at the isolators on the APRM inputs to SPDS could have led to the failure of the 20 VDC power supplies in all six APRM channels. These power supplies also serve as the power source for the relays that provide a trip signal to the RPS system. A fault within the SPDS system could propagate through the isolator and cause the relays to deenergize. When the relays deenergize, a reactor scram is initiated.

The power supply for the isolator on the HPCI system input to interim ERCS is also used as the power supply for the HPCI control loop. Consequently, a failure originating in the interim ERCS system could have caused the loss of the HPCI control loop power supply. Without the HPCI control loop, HPCI would be inoperable.

In both deficiencies discussed above, there is adequate protection on the Class 1E power supplies to prevent their failure from propagating and affecting additional safety related functions.

CORRECTIVE ACTIONS

Unit 1 & Common:

- (1) The power supply on the isolator for HPCI inputs to interim ERCS is disconnected. A non-1E power supply will be provided for the isolator by PMR 84-3011 prior to the end of the first refueling outage.
- (2) A non-1E power source has been provided for the isolator on the APRM inputs to SPDS under DCP 82-174C, Rev. 5.
- (3) The remaining Unit 1 and common TEC Model 156 isolators procured under Purchase Order 8856-J-049-AL were reviewed by an examination of the design drawings and/or a field inspection. This review is documented under NCR 84-026.

Unit 2:

- (1) A non-1E power supply will be provided for the isolator on HPCI inputs to interim ERCS prior to initial criticality under PMR 84-3048.
- (2) A non-1E power supply will be provided for the isolator on the APRM inputs to SPDS prior to fuel load. This work is being done under NCR 83-1110 and NCR 83-1174.
- (3) The remaining Unit 2 TEC Model 156 isolators procured under Purchase Order 8856-J-049-AL will be reviewed by an examination of the design drawings and/or a field inspection. This review will be documented under NCR 84-027.