



Pennsylvania Power & Light Company

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Norman W. Curtis
Vice President-Engineering & Construction-Nuclear
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September 30, 1983

Dr. Thomas E. Murley
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION
SECOND INTERIM REPORT OF A DEFICIENCY INVOLVING
GE REACTOR MODE SWITCH
ER 100508 FILE 821-10
PLA-1872

Docket No. 50-388

Reference: PLA-1652 dated May 6, 1983

Dear Dr. Murley:

This letter serves to provide the Commission with an interim report on a deficiency involving the Unit 2 Reactor Mode Switch. This deficiency was originally reported by telephone to Mr. D. Johnson of NRC Region I on April 7, 1983, by Mr. J. Saranga of PP&L as potentially reportable under the provisions of 10CFR50.55(e) for Unit 2. The referenced PLA-1652 provided the Commission with an interim report which included the results of the tests and analyses performed by Franklin Institute Research Laboratory on the mode switch which failed in Unit 1 (Unit 1 failure was reported as LER #83-043).

The attachment to this letter contains a description of the deficiency, its safety impact, and the corrective action plan. PP&L anticipates providing the Commission with a final report in December, 1983.

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 in compliance thereto.

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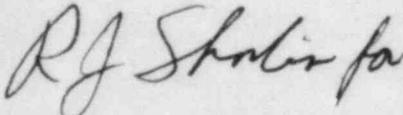
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We trust the Commission will find this report to be satisfactory.

Very truly yours,

A handwritten signature in cursive script, appearing to read "N. W. Curtis".

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

JS:sab

Attachment

js/lt/i/145/a

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Copy to:

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Washington, D.C. 20555

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SECOND INTERIM REPORT

SUBJECT

Deficiencies detected in the Unit 1 Reactor Mode Switch when it failed to actuate a channel of the RPS as designed.

DESCRIPTION/EXTENT OF DEFICIENCY

The original Unit 1 Reactor Mode Switch failed to actuate RPS Channel B when moved from STARTUP to SHUTDOWN. A bench check at SSES of a replacement switch indicated intermittent operation of this second switch. After bench testing at GE four additional switches were received at the site and successfully bench tested. One of these was installed in Unit 1. The original switch was then examined by Franklin Institute Research Laboratory. This examination indicated a number of design and manufacturing deficiencies. These included:

- 1) Cams were made of softer material than the cam follower, leading to possible wear concerns.
- 2) Cams that performed identical functions did not have identical shapes.
- 3) In the transition from metal key shaft to plastic cam shaft, there was not a tight fit, resulting in wear on the plastic transition piece, and switch handle movement without identical plastic cam shaft movement.
- 4) The cam shaft was made of segmented plastic pieces that fit together. As a result of tolerances this allowed a difference in cam shaft rotation from front to back.
- 5) The cam followers rode in a relatively wide set of guides. This can result in the cam follower cocking. The contact bar is attached directly to the cam follower. The cocking of the cam follower can result in a cocking of the contact bar and can result in incorrect contact position.

- 6) The wire terminal point is a direct extension of the stationary contact. Movement of the wires can, if the contact is held in place loosely, (due to tolerance build-up) cause the stationary contact to move.

A mode switch of the same design as the original Unit 1 mode switch was intended for use in Unit 2.

SAFETY EVALUATION

This failure represents a significant deficiency in the design and manufacturing of the Reactor Mode Switch which, if it is not corrected or otherwise accounted for, could adversely affect the safety of the plant by either failing to scram the plant manually when the switch is moved to SHUTDOWN or by failing to clear a bypass when switch position is changed.

CORRECTIVE ACTIONS (UNIT 2)

Initially GE partially redesigned the mode switch. Testing based on the switch specification, the test laboratory findings and previous testing indicated that the redesign failed to meet a design requirement (i.e. contact make before break). As a result PP&L has undertaken two parallel courses of action.

(a) GE Switch Redesign

GE, in cooperation with Gould Rundel, has redesigned the mode switch to correct deficiencies 1 through 5 identified above. Deficiency 6 has been judged to be minor by GE. The positive benefit (ie. a slight wiping of the contacts to help maintain good surface to surface contact) outweighs any perceived negative impact. Prototypes of the new design have been successfully tested by GE (witnessed by PP&L).

It is PP&L's intention to take a sample from the next production lot (delivery tentatively scheduled for 10/7/83) and have this tested by an independent testing laboratory (completion scheduled for 12/1/83) to demonstrate: correction of previous deficiencies, lack of new problems, and adequate switch life.

(b) Alternate Switch Design

PP&L has sent out for bids a specification based on the original mode switch specification, the specific conditions of operation at Susquehanna SES and standard switch requirements. Due to the requirements for testing and documentation for a new class 1E design, present schedules call for availability no earlier than 12/15/83.