

ROBERT E. DENTON
Vice President
Nuclear Energy

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657
410 586-2200 Ext. 4455 Local
410 260-4455 Baltimore



March 28, 1994

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Reply to Notice of Violation Inspection Report Nos. 50-317(318)/94-05
Failure to Adequately Implement Modification Design Control Measures

REFERENCE: (a) Letter from Mr. C. J. Cowgill (NRC) to Mr. R. E. Denton (BGE),
dated February 24, 1994, NRC Region I Special Inspection Report
Nos. 50-317/94-05 and 50-318/94-05

In response to Reference (a), please find Attachment (1) detailing our response to the cited violation concerning modification design control measures.

Should you have any questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

RED/RCG/bjd

Attachment

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
R. A. Capra, NRC
D. G. McDonald, Jr., NRC
T. T. Martin, NRC
P. R. Wilson, NRC
R. I. McLean, DNR
J. H. Walter, PSC

9403310221 940328
PDR ADOCK 05000317
G PDR

Cliff # 2799387217

JED

ATTACHMENT (1)

REPLY TO NOTICE OF VIOLATION
INSPECTION REPORT NOS. 50-317(318)/94-05

FAILURE TO ADEQUATELY IMPLEMENT
MODIFICATION DESIGN CONTROL MEASURES

I. DESCRIPTION OF VIOLATION

Reference (a) states that on or before January 11, 1994, design control measures were not provided for verifying or checking the adequacy of the installation of our Unit 2 13.8 kv voltage regulator modification sudden pressure trip relays. The inspection report states that inadequate design instructions, communications breakdowns, and inattention to detail resulted in the modification installation that was incomplete, not fully tested and inadequately evaluated. This, in conjunction with an electrical ground, caused a Unit 2 reactor trip and partial loss of offsite power on January 12, 1994. Reference (a) characterized the lack of adequate design control measures to verify or check the adequacy of this modification design, such as by the performance of design reviews or by the performance of a suitable test program, as a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control."

II. REASON FOR VIOLATION

The violation occurred as stated. Following the event, on January 12, 1994, we formed a Significant Incident Finding Team (SIFT) to determine the root causes, initiate corrective action, and formulate recommendations to prevent recurrence. The SIFTs detailed analysis of this event has identified the following root causes.

- A. Our control of new equipment while under construction was less than adequate. The 50.59 safety evaluation required the sudden pressure trip protective circuit to be disabled. This circuit was energized and enabled prematurely. The Design Instructions did not adequately implement the requirements of the 50.59 safety evaluation as required by our modification procedures. This inadequate design control carried through the implementing work package.
- B. The modification process did not adequately require testing to be integrated with work in progress. The 50.59 safety evaluation specified the required voltage regulator transfer switches' positions to disable the trip circuit. The voltage regulator bypass transfer switch auxiliary contacts were assumed, but not verified, to be functional. Sudden pressure trip sensor devices were not detected disconnected.
- C. Less than adequate communications existed between project team members. After many of the project meetings, there were conflicting views of the planned approach to ensure the protective circuits were disabled. Imprecise communications confused 13.8 kv and 125 VDC work and misleading statements existed about "associated DC circuits" and "breaker control wiring."
- D. The design review conducted by personnel involved with this modification was less than adequate. The specified sudden pressure increase seal-in relay circuit is susceptible to inadvertent actuation when its sensor is disconnected. The designated method for enabling and disabling the protective circuit (auxiliary switches) was less than adequate. Opportunities were missed by our design personnel to detect the sensitivity of the solid-state seal-in relay during the design review phase of the project.

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III. CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

Immediately following the event, the construction areas around the Unit 1 and Unit 2 voltage regulator project were physically posted and quarantined. The Plant General Manager established the SIFT to assess the event. Using an approved troubleshooting plan, plant electricians identified, isolated, and cleared the electrical ground. They also identified that the Unit 2 voltage regulators sudden pressure trip was the only actuated protective device. Each voltage regulator sudden pressure trip circuit was disconnected from its respective 13.8 kv feeder breaker. The Unit 1 and Unit 2 voltage regulator transfer switch assemblies were tagged and locked in the bypass mode. All work associated with the voltage regulator project that could affect operable plant systems was stopped, pending Plant General Manager approval.

IV. CORRECTIVE ACTIONS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

On March 2, 1994, the Plant General Manager approved the SIFT report, Calvert Cliffs Event Report 9401. The following preventive actions are being taken:

- A. We are currently reviewing the 50.59 safety evaluation, design instructions, and associated implementing procedures for this modification. They will be revised, as necessary, to ensure they are consistent with each other.
- B. We are developing an integrated test plan for the 13.8 kv voltage regulator project. The project implementation plan will be presented to the Plant Operations and Safety Review Committee and the Plant General Manager.
- C. We will require minutes for project meetings to document concurrence on agreements.
- D. We plan to replace the solid-state seal-in relay with a design that is less susceptible to spurious actuation. We plan to remove the auxiliary contacts from the sudden pressure trip circuit and install new test switches.
- E. This event has been reviewed with the personnel involved.
- F. We are proceduralizing guidance for review and control of "potential high risk" construction activities.
- G. We will develop guidance on how and when to defeat and enable protective circuits.
- H. We are developing procedural guidance for integrated work/testing requirements for modifications.

Corrective actions specific to the 13 kv project will be completed prior to resuming work that could affect operable equipment. Generic corrective actions are being implemented in phases and are scheduled to be complete by April 1, 1995.

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V. DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED.

Full compliance was achieved on January 12, 1994 when: (1) the Unit 1 and Unit 2 voltage regulators' sudden pressure trip circuits were disconnected from their respective 13.8 kv feeder breakers, and (2) the Unit 1 and Unit 2 voltage regulator transfer switch assemblies were tagged and locked in the bypass mode.