

Public Service
Electric and Gas
Company

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Vice President, Nuclear Operations

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United States Nuclear Regulatory Commission
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Gentlemen:

RESPONSE TO NOTICE OF VIOLATION
NRC INSPECTION REPORT 50-354/92-13
DOCKET NO. 50-354
HOPE CREEK GENERATING STATION

Public Service Electric and Gas Company (PSE&G) is in receipt of your letter, dated November 10, 1992, which transmitted a Notice of Violation citing failure to comply with requirements of 10CFR50, Appendix B, Criterion XV, "Non-conforming Materials, Parts, or Components".

Pursuant to the provisions of 10 CFR 2.201, our response to the Notice of Violation is provided in Attachment 1.

Sincerely,



Attachment

C Ms. A. Keller
USNRC Licensing Project Manager (Acting)

Mr. T. P. Johnson
USNRC Senior Resident Inspector

Mr. T. T. Martin, Administrator
USNRC Region I

Mr. K. Tosch, Chief
Bureau of Nuclear Engineering
New Jersey Department of Environmental Protection

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ATTACHMENT 1

10 CFR 2.201 INFORMATION
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
HOPE CREEK GENERATING STATION
RESPONSE TO NOTICE OF VIOLATION
INSPECTION REPORT NO. 50-354/92-13

10CFR50, Appendix B, Criterion XV, "Non-conforming Materials, Parts, or Components," requires that, in part,... "measures be established to control components which do not conform to requirements in order to prevent their inadvertent use. These measures shall include, procedures for identification, documentation, disposition, and notification to affected organizations. Non-conforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Contrary to the above, during maintenance activities (work order 911126153) between September 26-28, 1992, a wiring error was introduced in Residual Heat Removal (RHR) motor operated valve (MOV) 1BC-HV-F024A. Subsequent MOV testing and troubleshooting activities during the period September 29-30, 1992, noted the existence of a wiring error in this RHR MOV; however, the error was not completely identified or documented, nor dispositioned, nor were appropriate notifications made to management and/or quality assurance personnel. Although a jumper wire was installed in the 1BC-HV-F024A wiring circuits, the nonconforming condition was not repaired. As a result, on October 2, 1992, an unplanned loss of the reactor cavity water occurred, partly due to this MOV 1BC-HV-F024A wiring error.

I. PUBLIC SERVICE ELECTRIC AND GAS COMPANY DOES NOT DISPUTE THAT A VIOLATION OCCURRED. A clarification and explanation of the event follows.

Our investigation into the event has determined that an initial wiring error was introduced into the subject valve during implementation of work order 911126153. This work order required that maintenance personnel remove power and control leads from 1BC-HV-F024A (RHR full flow and return valve) for trouble-shooting and preparation of votes testing being performed per Generic Letter 89-10. The terminal block for the subject valve is inverted and close to the floor so that technicians must manipulate leads from under and up into the unit.

The work order and procedure require documenting each lead removed on a lifted lead sheet. This ensures that lifted leads are returned to their proper terminal upon restoration.

Between September 26 and September 27, 1992, two technicians were assigned to remove approximately 10 leads from the subject valve actuator. Two affected terminals were pertinent to this event.

The terminal labeled 15C includes two leads, one of which was required to be removed. Terminal 14C also required a lead to be lifted. It is hypothesized that from the position being worked, the second lead on terminal 15C dropped off and was hanging freely while removing the required lead. This was not detected by the technicians. Subsequently while removing the lead on 14C, the free lead, which is an internal jumper, was probably detected and landed on 14C. The lifted lead sheet only records leads that are required to be left disconnected and thus the internal jumper was not required to be documented.

On September 29 - 30, 1992, valve test technicians working under the same work order noted that valve position indication was not provided to the Control Room. It was determined by them that the power to provide indication was supplied from terminal 15C. They failed to detect the mislanded lead on 14C. The technicians installed a temporary jumper and completed testing satisfactorily.

This temporary jumper was documented on the work order and the System Engineer in charge of the system was notified. The System Engineer directed the valve testing crew to restore the wiring in accordance with the drawings. The temporary jumper was then made permanent.

Unknown to the persons involved, the combination of the mislanded lead and the new jumper created an interaction between the control circuits of 1BC-HV-F024 and MOV 1BC-HV-F006A (RHR pump shutdown cooling suction valve). HV-F006A was tagged closed and out of service at the time.

With HV-F006A tagged out of service, control power from HV-F024A picked up the HV-F006A open coil and attempted to drive the valve open through the control power transformer. This resulted in a blown control power fuse for HV-F006A. This was undetected because the valve was out of service.

On October 2, 1992, while restoring the system, power was restored to HV-F006A. Power failure indication was then received in the Control Room due to the blown fuse. After troubleshooting had identified the blown fuse, a work order for replacement was initiated.

When power was restored to HV-F024A, control power from this valve picked up the open coil of HV-F006A. However this time HV-F006A was energized, and the motor drove the valve open without an open command from the Control Room. With 1BC-HV-F008 and F009 (shutdown cooling common suction isolation valves) and 1BC-HV-F004A (RHR torus suction valve) open, a drain path was established between the reactor cavity to the torus.

The event was terminated in approximately 5 minutes when operators isolated 1BC-HV-F004A and 1BC-HV-F008 and F009, closing the drain path. A decrease in cavity water level of approximately 20 inches and an increase of torus water level of approximately 7 inches occurred during this time.

Water level was re-established utilizing the control rod drive system with suction from the condensate storage tank. Fuel Pool Cooling pumps which tripped by design, were restored in approximately 1 hour and 22 minutes.

Corrective Steps Which Have Been Taken and The Results Achieved:

- 1) Public Service Electric and Gas Company (PSE&G) has had an in-depth, detailed, independent root cause analysis performed by the On-Site Safety Review Group (SRG). This report is currently drafted and awaiting final approval.
- 2) As discussed above, water level and fuel pool cooling were quickly re-established. No radiological consequences resulted from this event.
- 3) Troubleshooting on the valve (HV-F024A) included a complete wiring check and corrected all wiring errors.
- 4) A discussion was held with all maintenance and valve test supervisory personnel about the event.
- 5) Interface meetings were held between the valve testing group supervisors, system engineers, and maintenance management to strengthen the lines of communication between the groups and to clarify management expectations on resolution of retest problems.

Corrective Steps Which Will Be Taken To Avoid Further Violations:

- 1) Although all wiring work discussed above included verification, this was not effective in detecting the mislabeled lead. This was due to requiring only leads being worked to be documented and verified.

To preclude this from occurring again, the lifted lead and troubleshooting procedure is going to be revised to require accounting of all wires on affected terminals.
- 2) Work performed on the subject valve was in accordance with a proper work order (Corrective Action Document) per NC.NA-AP.ZZ-0009(Q) "Work Control Process". However, there was less than adequate follow-up (identification, documentation or notification) by the valve testing personnel to the originally discovered missing lead.

A discussion of this event including procedural expectations and lessons learned will be incorporated into appropriate continuing training programs.

- 3) A contributing factor to this event, was that the valve testing did not provide a thorough post maintenance re-test. The valve testing did not completely check installed interlocks due to the electrical tagging involved.

Future post maintenance testing of the shutdown cooling valves will be expanded to include testing of valve interlocks.

PSE&G agrees that the event should not have occurred and believe that the corrective steps detailed above and additional actions under consideration from the SRG report will preclude a similar event from occurring.

The Date When Full Compliance Will Be Achieved;

PSE&G is in full compliance. Additional preventative actions detailed above will be completed by July 1, 1993.