October 1, 1997

Mr. Leon R. Eliason
Chief Nuclear Officer & President
Nuclear Business Unit
Public Service Electric & Gas Company
PO Box 236
Hancocks Bridge, NJ 08038

SUBJECT: Inspection Report 50-354/97-04

Dear Mr. Eliason:

This letter refers to your September 9, 1997, correspondence (LR-N970572), in response to our August 11, 1997 letter.

Thank you for informing us of the corrective and preventive actions for the Notice of Violation, as documented in your letter. The violation involved a failure to promptly identify an inoperable high pressure coolant injection (HPCI) system injection valve, before intentionally removing the two residual heat removal (RHR) subsystems from service for planned work. Your response indicates that corrective actions for this event center on feedback to licensed operators in the form of training. We will evaluate the effectiveness of these actions in future inspections.

Your response also states that you take exception to a statement in the inspection report that the decision to "maintain the operability of the HPCI system was non-conservative." However, our concern was focused on your decision to remove the RHR subsystems from service *before the degraded condition with the HPCI system was fully understood*. As was described in the inspection report, engineering and operations personnel continued to evaluate and question the data collected during the initial troubleshooting that followed the injection valve failure, even after the HPCI system was declared operable. These reviews, combined with additional troubleshooting, led to the conclusion that the basis for the initial determination that the HPCI system was operable, was incorrect.

If you have additional concerns or comments, please feel free to contact us. Your cooperation is appreciated.

Sincerely,

Original Signed By:

James C. Linville, Chief
Projects Branch 3
Division of Reactor Projects

Docket No. 50-354

IE:01

cc:
L. Storz, Senior Vice President - Nuclear Operations
E. Simpson, Senior Vice President - Nuclear Engineering
E. Salowitz, Director - Nuclear Business Support
M. Bezilla, General Manager - Hope Creek Operations
J. McMahon, Director - Quality Assurance & Nuclear Safety Review
D. Powell, Manager - Licensing and Regulation
A. Tapert, Program Administrator

cc w/cy of Licensee's Letter:
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J. Isabella, Manager, Joint Generation
Atlantic Electric
R. Kankus, Joint Owner Affairs
J. Keenan, Esquire
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Distribution w/copy of Licensee's Response Letter:
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Public Service
Electric and Gas
Company

Louis F. Storz
Senior Vice President - Nuclear Operations

Public Service Electric and Gas Company P.O. Box 236, Hancocks Bridge, NJ 08038 609-339-5700

LR-N970572

SEP 08 1997

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REPLY TO NOTICE OF VIOLATION
INSPECTION REPORT NO. 50-354/97-04
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

Gentlemen:

Pursuant to the provisions of 10CFR2.201, Public Service Electric an Gas Company (PSE&G) hereby submits a reply to the Notice of Violation (NOV) issued to the Hope Creek Generating Station in a letter dated August 11, 1997. This violation involved not fully understanding the degraded condition of a High Pressure Coolant Injection Valve before removing the "A" and "C" Residual Heat Removal systems from service. This was cited as a violation of 10CFR50, Appendix B, Criterion XVI. The details of the reply are contained in the attachment to this letter.

Should you have any questions or comments on this transmittal, do not hesitate to contact us.

Sincerely,

L. F. Storz
Senior Vice President -
Nuclear Operations

Attachment (1)

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C Mr. H. J. Miller, Administrator - Region I
U. S. Nuclear Regulatory Commission
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Mr. D. Jaffe, Licensing Project Manager - Hope Creek
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Mr. S. Morris
USNRC Senior Resident Inspector (X24)

Mr. K. Tosch, Manager IV
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RESPONSE TO APPENDIX B, CRITERION XVI VIOLATION
INSPECTION REPORT NO. 50-354/97-04
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

I. DESCRIPTION OF VIOLATION

The description of the violation contained in the Notice of Violation received in the August 11, 1997, letter is as follows:

"10 CFR 50 Appendix B Criterion XVI requires in part that conditions adverse to quality such as equipment non-conformances be promptly identified and corrected. Contrary to the above, on June 16, 1997, an inoperable high pressure coolant injection system (HPCI) injection valve was not promptly identified. Specifically, a degraded HPCI injection valve condition was not fully understood before the "A" and "C" residual heat removal systems were intentionally removed from service."

This is a Severity Level IV violation (Supplement I).

II. REPLY TO VIOLATION

A. PSE&G Position

PSE&G agrees with the violation as stated in the description of violation. However, PSE&G takes exception with the statement in the inspection report that the initial decision to maintain the operability of the High Pressure Coolant Injection (HPCI) system was non-conservative. The operators followed the normal plant processes, which included an operability determination, a follow-up assessment, initiation of a temporary modification, and a validation of the original assumptions. The operators exercised prudent judgment and had reasonable assurance of operability when they allowed the "A" and "C" Residual Heat Removal system to be removed from service.

Description of Event

On June 16, 1997, while performing a HPCI valve surveillance test, the HPCI full flow test return valve failed to stroke open. Several hours earlier, the valve had been successfully stroked for the same test. Troubleshooting determined that an interlock contact on a HPCI injection valve was open and should be closed to allow the HPCI full flow test return valve to open. The Work It Now (WIN) team determined this by jumpering the appropriate contact and the HPCI full flow test return valve was verified to stroke. At

this time, the HPCI full flow test return valve did not automatically close. This allowed the valve surveillance to be completed satisfactorily and an operability determination was performed which declared HPCI "operable but degraded". The WIN team took resistance readings across contacts, one of which provides the automatic closure function of the HPCI full flow test return valve from the HPCI injection valve. The reading from this contact was not fully consistent with the valve position. The reason for this reading was unknown at the time, but was considered to be minor because the HPCI injection valve had stroked successfully during the surveillance test.

The initial evaluation of this condition concluded that the HPCI system was operable, but degraded. This decision was based on the reasonable assurance of operability that was provided to the operators based on the fact that the HPCI full flow test return valve acted as expected in that it did not automatically close. Also contributing to the decision was the fact that although the condition did prevent the use of HPCI in the full flow test mode of operation, the identified condition would not prevent HPCI from performing its safety function of automatically injecting into the Reactor Pressure Vessel.

On June 17, 1997, the "A" and "C" Residual Heat Removal (RHR) systems were removed from service to conduct scheduled maintenance activities. The Action Statements associated with Technical Specifications 3.5.1.b, Emergency Core Cooling Systems - Low Pressure Coolant Injection, and 3.6.2.3, Suppression Pool Cooling, were entered at 0501.

Because the failure of the HPCI full flow test return valve prevented the use of HPCI in the pressure control mode, Engineering was tasked with developing a temporary modification that would allow this mode of HPCI to function. During the process of researching and developing the temporary modification, additional concerns about the HPCI injection valve's status were raised by the Motor Operated Valve (MOV) Engineer. These concerns were reviewed with Maintenance Engineering and a Maintenance Engineer was requested to validate the concerns and review the valve interlocks. At this point, Operations, Maintenance, and Engineering still believed that only the HPCI full flow test return valve was affected. Evaluation continued through June 17, 1997.

In accordance with the established workplan, the "A" RHR system was returned to an operable status on June 18 at 0040. At approximately 0900, on June 18, Operations was informed of the validated additional concerns with the HPCI injection valve. Based on these concerns, equipment in the "C" RHR system was restored and the system was returned to an operable status on June 18 at 2047. Additionally, when

Operations was informed of the validated additional concerns with the HPCI injection valve, a troubleshooting team consisting of Operations, Maintenance, and Engineering was established. A series of valve strokes was planned to be performed.

While stroking the HPCI full flow test valve open, the valve opened and then automatically closed, unlike the evolution on June 16. This response was not expected and additional troubleshooting was performed.

At 2015, on June 18, HPCI was declared inoperable based on a review of the additional troubleshooting information (e.g. contact readings associated with the HPCI full flow test valve) and because Operations no longer believed that a reasonable assurance of operability was being maintained. Operations entered the Action Statement required by Technical Specification 3.5.1.c, Emergency Core Cooling Systems - HPCI. The Action Statement associated with the HPCI LCO was conservatively back-dated to 0330 on June 16, when the issue with HPCI was first identified. Later that evening, around 2252, during subsequent troubleshooting, the HPCI injection valve did not stroke. It should be noted that the HPCI injection valve's limit switches were later determined to be the root cause of the HPCI valve performance issues.

Because the Action Statement was entered retroactively to 0330 on June 16, 1997, for a period of time on June 17 and 18, HPCI was technically inoperable in conjunction with "A" and "C" RHR outages. This combination is not addressed by Technical Specifications; therefore, Technical Specification 3.0.3 applied, and a plant shutdown would have commenced if the inoperability of HPCI had been recognized while both the "A" and "C" RHR were inoperable. Per Technical Specification 3.0.3 requirements, a plant shutdown would have been completed if neither HPCI nor one of the RHR loops had been restored to operability.

B. <u>Reason for the Violation</u>

The apparent cause of the failure to enter 3.0.3 was the lack of recognition that HPCI was inoperable until June 18, 1997. In retrospect, the degraded HPCI injection valve condition was not fully understood before the "A" and "C" RHR systems were intentionally removed from service. The condition of the HPCI valves was not fully understood - partially because this event included a different failure mechanism than previously experienced and, finally, the station organization did not effectively validate, verify, and interpret information gathered through troubleshooting.

C. **Corrective Steps That Have Been Taken and Results Achieved**

Operations management developed a case study for tabletop discussions with the operating crews. This case study includes the specifics of this event, lessons learned from other historical events, and a comparison of what went right and what went wrong in each of the events. The case study has been discussed with each of the operating crews, the tabletop discussions were completed by September 3, 1997.

D. **Corrective Steps That Will Be Taken to Avoid Further Violations**

Maintenance and System Engineering will use this event as a case study for tabletop discussions. This case study will include the specifics of this event, lessons learned from other historical events, and a comparison of what went right and what went wrong in each of the events. These tabletop discussions will be completed by January 31, 1998.

E. **Date When Full Compliance Will Be Achieved**

Full compliance was achieved when "A" and "C" RHR loops were returned to service on June 18, 1997 and the HPCI injection valve was repaired on June 21, 1997.