

September 29, 1995

Mr. Leon R. Eliason
Chief Nuclear Officer and President
Nuclear Business Unit
Public Service Electric & Gas Company
Post Office Box 236
Hancocks Bridge, New Jersey 08038

SUBJECT: INSPECTION 50-354/95-10

Dear Mr. Eliason:

This letter refers to your September 11, 1995 correspondence, in response to our August 11, 1995 letter.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a future inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,

ORIGINAL SIGNED BY:

John R. White, Chief
Reactor Projects Section 2A
Division of Reactor Projects

Docket No. 50-354

cc:

L. Storz, Senior Vice President - Nuclear Operations
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Mr. Leon R. Eliason

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SEP 11 1995

LR-N95139

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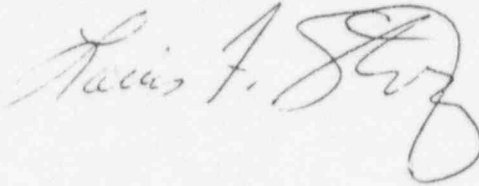
Gentlemen:

REPLY TO A NOTICE OF VIOLATION
INSPECTION REPORT NO. 50-354/95-10
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

Pursuant to the provisions of 10CFR2.201, this letter submits the response of Public Service Electric and Gas Company to the notice of violation issued to the Hope Creek Generating Station in a letter dated August 11, 1995.

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

Sincerely,



Attachment



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ATTACHMENT

REPLY TO NOTICE OF VIOLATION
INSPECTION REPORT NO. 50-354/95-10
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

LR-N95139

I. INTRODUCTION

During an NRC inspection conducted between May 28, 1995, and July 8, 1995, four violations of NRC requirements were identified. As a result, the NRC issued a notice of violation for these violations in a letter dated August 11, 1995.

In accordance with the provisions of 10CFR2.201, Public Service Electric and Gas Company hereby submits a written response to the notice of violation which includes for each violation requiring a response: (1) the reason for the violation; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved.

For the matter related to procedure non-compliance and resulting loss of shutdown cooling, the notice of violation issued on August 11, 1995, stated that no response is required. The notice of violation stated that reason for the violation and the corrective actions taken and planned to correct the violation and prevent recurrence have already been adequately addressed on the docket in Hope Creek Licensee Event Report (LER) 95-006-01, dated June 20, 1995. The description of our corrective actions in the LER does reflect our actions and position accurately; however, Public Service Electric and Gas Company has chosen to respond by providing a clarification of these corrective actions reflecting the July 8, 1995, shutdown cooling bypass event.

II. REPLY TO THE NOTICE OF VIOLATION

In this response, the failure to implement effective corrective actions for the Hiller-actuated valve failures will be referred to as Violation A, the failure to perform Technical Specification Surveillance Requirement 4.6.3.5 for the transversing in-core probe (TIP) explosive isolation valve will be referred to as Violation B, the failure to update the Hope Creek Updated Final Safety Analysis Report (UFSAR) in accordance with 10CFR50.71(e)(4) will be referred to as Violation C and the failure to follow operating procedures, resulting in a loss of shutdown cooling, will be referred to as Violation D.

The transmittal letter for NRC Inspection Report 50-354/95-10 expressed a concern with the number of violations that have occurred recently at Hope Creek and requested that information be provided regarding improvements recently implemented to the

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Reply to Notice of Violation

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corrective action program. In the inspection report, only one of the violations was cited for ineffective corrective actions. However, as stated in the violation responses, PSE&G realizes that these violations reflect weaknesses in implementing our corrective action program. Although each of these responses describe how the changes to the corrective action program would reduce the likelihood of similar violations from recurring, PSE&G is also providing the following broader perspective on corrective action program improvements.

The corrective action program was discussed at length during the July 28, 1995 enforcement conference concerning the Salem Generating Station. At that enforcement conference, Nuclear Business Unit (NBU) management described actions that had been taken to address corrective action program performance deficiencies. As discussed at that meeting, the NBU has developed and implemented a new Corrective Action Program (CAP) to ensure timely problem identification and resolution. As part of the development of the CAP, the NBU benchmarked several other utility's programs that have been successfully consolidated.

The CAP has consolidated and improved previously existing programs within the NBU. The program includes a low threshold for reporting problems, provides for aggressive problem assessment and root cause determination, and establishes management controls on completion schedules for specified corrective actions. The CAP includes a graded approach to root cause determination based on significance level. The CAP also requires timely (30 days or less) completion of cause determination.

Accountability for CAP implementation rests with station line management. As such, station managers are responsible to ensure cause determinations are appropriately thorough, including the designation of corrective actions to address root and contributing causes. The Director - Quality Assurance/Nuclear Safety Review has oversight responsibility for the CAP and has established dedicated resources under the Manager - Corrective Action and Quality Services, to fulfill that responsibility. Measures have also been established to monitor the performance of the corrective action process. These include performance indicators and monthly reports to senior management.

In conclusion, changes to the CAP and management oversight practices have been and will continue to be made to improve and further assure appropriate levels of CAP performance.

A. Violation A

1. Description of the Notice of Violation

"10 CFR 50, Appendix B, Criterion XVI 'Corrective Action' requires that licensees identify significant conditions adverse to quality, determine their causes, and take corrective action to preclude recurrence.

Contrary to the above, in June of 1995, the following example of a failure to meet this requirement occurred over the period from September 1993 to April 1995. On September 6, 1993, equipment operators identified two Hiller actuated flex wedge gate valves that failed to open on demand. These valves represented two out of a total population of 32 similar safety auxiliaries cooling system isolation valves used for engineered safety feature system room coolers. As a result of this September 6, 1993 event, PSE&G identified the root causes and implemented the corrective actions described in Licensee Event Report (LER) 93-006. However, on October 22, 1994, two additional similar failures occurred, indicating that the previous root causes and corrective actions were less than adequate. Subsequent PSE&G investigation led to the identification of additional root causes and corrective actions which were described in LER 94-017. Again, on April 23, 1995, two Hiller-actuated valves failed to open on demand. PSE&G follow-up review led to the discovery of even more contributing causes. Further, not all corrective actions specified in the 94-017 LER had been implemented prior to the April 1995 failures.

This is a Severity Level IV violation (Supplement 1)."

2. Response to Notice of Violation

PSE&G has reviewed the circumstances described by the NRC and concurs with the facts cited in the violation.

i. Description of Event

On September 6, 1993, two diesel generator room cooler valves were declared inoperable when they failed to open on demand. The apparent cause determination of the valve sticking indicated that excessive closing force was exerted on the valve gates by the actuator. A design change previously prepared for a packing modification failed to identify that the reduced packing drag would require reducing the air pressure to the actuator.

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Reply to Notice of Violation

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Corrective actions were implemented to eliminate the valve sticking problem associated with this particular failure mode, and involved the reduction of supply air pressure to the Hiller-actuated valves. Following completion of these corrective actions, Hiller actuated valve operation was observed to be satisfactory and the failure rate was reduced to zero for approximately 13 months.

On October 22, 1994, during the performance of a quarterly IST valve stroking, two Hiller actuated room cooler valves failed to stroke open. To determine the cause of the failures, the valves were disassembled to inspect for stem galling or mechanical failure. The inspection identified no abnormal mechanical degradation, however, a review against the maintenance history for the valves confirmed that the installed valve packing was inconsistent with the design information on the material type and configuration. Based on these inspection results, an additional failure mode for valve sticking (i.e., inadequate packing installation and configuration control) was determined to be the principal cause of the valve failures. Corrective actions were initiated to replace the packing in all of the Hiller actuated valves with a single material type and configuration.

In support of these packing replacement modifications, enhanced as-found diagnostic testing was initiated. This extensive field testing, led to direct evidence (as opposed to inferred) that the major contributor to the excessive binding was overthrusting of the gates into the seats of the valve. The failure modes resulting in overthrusting were later confirmed (in a failure mode analysis discussed later) to be the major cause of the valve sticking problem.

On April 23, 1995, two Hiller-actuated valves again failed to open on demand. An additional failure mode identified for valve sticking was attributed to drifting of the air regulator component of the valve. The regulators were disassembled on site and examined. Each regulator displayed seating damage that would cause the regulator to leak through allowing full air system pressure to be developed in the air cylinder and cause excessive seating force. This problem was corrected by replacing the filter regulator with a new model.

Corrective actions previously identified would not have been beneficial for this newly identified failure mode. However, this additional event underscored the need to identify all possible failure modes up front.

As indicated above, the Hiller-actuated valves had failed to open due to different failure modes. In June 1995, a thorough failure mode analysis was completed to fully resolve these valve problems by systematically identifying each potential failure scenario. This analysis determined that the procedural guidance for maintenance of these valves was inadequate. Specifically, the existing procedures provided guidance on minimum thrust capability without a limit on maximum thrust settings. In addition, the procedural method for setting the valve coupling gap resulted in a configuration where the air pressure force was transferred directly to the wedge of the valve which was already fully seated. These deficiencies resulted in the overthrusting phenomena identified during the packing replacement modifications.

To eliminate valve overthrusting, corrective actions were developed to revise the maintenance procedures for thrust settings and to utilize a mechanical stop that will prevent the piston in the actuator from traveling further in the closed position to prevent excessive binding and valve failures. These corrective actions are still being implemented for all of the Hiller actuated valves at Hope Creek.

ii. Reason for Violation

A lack of rigorous implementation of root cause methodologies by engineering personnel resulted in inadequate identification of all credible failure modes for the earlier failure analyses. This lack of structured methodology resulted in identification of only individual failure modes and not all potential credible failure modes which can result in valve sticking. As a result, previous corrective actions only resolved individual failure modes and therefore did not eliminate the problem of valve sticking. These earlier root cause investigations were initiated prior to improvements in procedural guidance on root cause determination processes.

Ineffective management implementation of standards for engineering excellence contributed to the lack of a comprehensive or rigorous root cause analysis and follow up action being performed for these failures.

iii. Corrective Steps That Have Been Taken and Results Achieved

- a. All affected valves are being modified to utilize a mechanical stop to prevent the piston in the actuator from traveling further into the seat than necessary (soft seating the valve).
- b. All affected valves are being modified to utilize a consistent valve packing configuration.
- c. All affected valves are being appropriately modified to upgrade the regulator and leave the regulators in a failed open position (no new credible regulator failure modes possible since regulator drift can no longer affect the valves).
- d. The root cause procedure was modified to provide guidance in utilizing personnel trained in appropriate failure mode analytical methods for situations warranting specific methodologies. Both a fault tree analysis and a failure mode analysis were conducted as a result of this action. In June 1995, these analyses were completed, which identified the primary causal factor of valve sticking to be overthrusting of the valves.
- e. New senior management in the Engineering organization has been established. These personnel have been communicating their expectations concerning the attributes of an effective engineering organization. Key attributes emphasized in these communications are: 1) identification, analysis and solution of technical problems in a timely fashion; 2) rigorous application of engineering principles and technical practices; and 3) maintaining a focus on safe operations and attention to detail in configuration management.

iv. Corrective Steps that Will Be Taken to Avoid Further Violations

- a. All planned Hiller-actuated valve modification corrective actions described above will be completed by December 31, 1995.
- b. The root cause evaluation work for the subject Hiller actuator failures is being verified for comprehensiveness by Failure Prevention Incorporated International (FPI). If new credible failure modes are

identified by the FPI, they will be evaluated as appropriate and the root cause evaluation process enhanced based on lessons learned. This review will be completed by October 31, 1995.

- c. A root cause team concept is being developed to dedicate personnel to root cause evaluations, providing sufficient failure mode analysis training and experience for consistency of root cause evaluations. This team will be established by December 31, 1995.

v. Date When Full Compliance Will Be Achieved

With the completion of the June 19, 1995 failure mode analysis, the root cause of the Hiller-actuated valve failures has been identified. Valve modification corrective actions will be completed by December 31, 1995.

B. Violation B

1. Description of the Notice of Violation

"Hope Creek Generating Station Technical Specification surveillance requirement 4.6.3.5 requires, in part, that at least one explosive squib from a traversing in-core probe (TIP) explosive isolation valve be tested at least every 18 months.

Technical Specification paragraph 4.0.2, 'Surveillance Requirements,' requires, in part, that each TS surveillance requirement shall be performed within its specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

Contrary to the above, none of the 5 TIP explosive isolation valves (squibs) had been tested from February 1991 until June 1995, which resulted in a 52 month interval between required surveillance tests.

This is a Severity Level IV violation (Supplement 1)."

2. Response to Notice of Violation

PSE&G has reviewed the circumstances described by the NRC and concurs with the facts cited in the violation.

i. Description of Event

On June 13, 1995, while reviewing pre-staged tagouts to

support maintenance for the upcoming refueling outage, Hope Creek outage planning department personnel noticed that there were no pre-staged tagouts for the traversing in-core probe (TIP) explosive shear valve squib replacements. A subsequent review of Technical Specification surveillance requirements against recurring tasks in the workorder system and the component history record, led to the determination that the 18 month surveillance requirement to actuate a TIP explosive shear valve squib had not been completed since February 1991. This review also determined that all five of the installed TIP shear valve explosive charges had exceeded their service life expiration date of June 1994.

The Hope Creek operators were notified and the five TIP shear valves were declared inoperable. Actions were taken in accordance with Technical Specifications to establish primary containment integrity by closing and removing power to the TIP probe guide tube isolation valves in the affected penetrations.

The above information is also contained in Hope Creek Licensee Event Report (LER) 95-009-00, dated July 13, 1995.

ii. Reason for Violation

The principal cause for the violation is attributed to personnel error resulting in improper initial coding of this recurring task in the workorder system during the late 1980's. This improper coding established an incorrect 90 month surveillance test frequency for this component. In addition, no recurring tasks were entered to ensure that the explosive charges would be replaced prior to exceeding their shelf or operating life.

Although the coding for this recurring task was incorrect, the surveillance had been performed appropriately until February 1991. Therefore, a possible contributing cause for this violation was the failure of personnel prior to February 1991 to identify this improper coding such that corrective actions could be taken to establish a proper surveillance test frequency for this component.

iii. Corrective Steps that Have Been Taken and Results Achieved

- a. All TIP explosive shear valve squibs have been replaced and two TIP shear valve explosive cartridges have been fired successfully. These actions have satisfied the surveillance test requirements of Technical

Specification 4.6.3.5.b.

- b. A new recurring workorder has been created to ensure that all explosive cartridges are replaced prior to expiration of their operating life and that the proper 18 month surveillance for firing the explosive cartridges is completed.
- c. A review of Licensee Event Reports was conducted to determine if similar events of missed surveillance test requirements have occurred. This review, which augmented the review of previous occurrences performed for LER 95-009-00, identified a total of 24 previous occurrences of missed surveillance tests with two of these occurrences caused by improper coding of recurring tasks.

Since the corrective measures taken for these two events included a review of the work order system coding for proper recurring task frequency, it is apparent that these actions were not effective in preventing recurrence. Therefore, we will perform a comprehensive review of: 1) Technical Specification surveillance test procedures to ensure the tests are performed in the correct operating mode; 2) the workorder database system to ensure correct coding of test frequency and procedure reference; and 3) the Technical Specification matrix to verify its completeness and accuracy. In September 1995, resources were dedicated for this review, which will be completed by December 31, 1996.

- d. The Corrective Action Program initiatives previously discussed involve corrective action weaknesses relative to this violation. Specifically, the issues of timely problem identification and effective corrective action development and implementation have been addressed by the Corrective Action Program.
- iv. Corrective Steps that Will Be Taken to Avoid Further Violations
- a. The Technical Specification surveillance test procedure, workorder system and matrix review described above will be completed and corrective actions implemented as appropriate.

v. Date When Full Compliance Will Be Achieved

On June 30, 1995, full compliance was achieved when the requirements of Technical Specification Surveillance Requirement 4.6.3.5.b were met.

C. Violation C

1. Description of the Notice of Violation

"10 CFR 50.71(e)(4) states that subsequent revisions (to the Updated Final Safety Analysis Report) must be filed annually or 6 months after each refueling outage provided the interval between successive updates to the FSAR does not exceed 24 months. The revisions must reflect all changes up to a maximum of 6 months prior to the date of filing.

Contrary to the above, on June 14, 1995, the NRC determined that Revision 6 to the Hope Creek Updated Final Safety Analysis Report, dated October 11, 1994, did not reflect all changes up to a maximum of 6 months prior to the date of filing. Specifically, a number of such changes were not reflected in the revision, an example of which involved a change to the main steam line radiation monitoring system (implemented on November 4, 1992, as Amendment No. 53 to the facility operating license) which implemented changes to the associated systems that were not subsequently reflected in the updated FSAR.

This is a Severity Level IV violation (Supplement 1)"

2. Response to Notice of Violation

PSE&G has reviewed the circumstances described by the NRC and concurs with the facts cited in the violation.

i. Description of Event

The Nuclear Licensing and Regulation Department is responsible for maintaining the Updated Final Safety Analysis Reports (UFSARs) for the Salem and Hope Creek stations and coordinates and controls changes to these documents. The current UFSAR change process is procedurally controlled by NC.NA-AP.ZZ-0035(Q), "Nuclear Licensing and Reporting."

In November 1994, an evaluation of pending work activities was being conducted by the responsible licensing supervisor. At that time, it was discovered by the

licensing engineer responsible for processing UFSAR change notices, that part of the current cycle change notices being processed included items that had not been processed previously in accordance with the required time requirements specified in 10 CFR 50.71(e)(4). This issue was brought to the supervisor's attention, at which time a more in-depth evaluation was initiated to better understand the extent of the problem. The change notice backlog dated back to the late 1980's, and several licensing engineers, supervisors and managers had been assigned responsibility for UFSAR maintenance from 1988 until 1994.

Because it was not known if the backlog was simply a problem with proposed changes that were abandoned, closeout paperwork, approved field changes awaiting implementation or actual modifications needing to be incorporated into the UFSAR, an inappropriate decision was made by licensing management to defer documenting this problem until the extent of the condition was determined. A schedule was developed and resources were applied to close out this apparent backlog by July 1995. There were approximately 135 backlog change notices for both Salem and Hope Creek combined, requiring some form of closeout.

Resource loading to ensure timely closeout of this backlog was insufficient. As such, significant action to address elimination of the backlog was not taken until March 1995. On April 5, 1995, it was confirmed that a modification to Hope Creek had been made without the change notice being incorporated into the UFSAR as required by 10 CFR 50.71(e)(4). This condition was promptly documented in problem report 950405238. On April 7, 1995, it was documented in Incident Report 95-365 that a similar situation existed for the Salem UFSAR.

Approximately 40 change notices were dispositioned as of late June, 1995. Based on this lack of significant progress in eliminating the backlog, a dedicated project team was assembled. As a result, approximately 80% of the backlog change notices have completed processing at this time.

ii. Reason for Violation

The principal cause for non-compliance with the requirements of 10 CFR 50.71(e)(4) is attributed to inadequate supervisory oversight for UFSAR maintenance. There was a lack of effective oversight of the UFSAR change process and licensing personnel failed to recognize the significance of the UFSAR change notice backlog.

A contributing cause is the failure to utilize formal processes for identifying items of noncompliance with regulatory requirements (i.e., immediately initiating an Incident Report). This resulted in less than adequate management oversight and action to address the backlog and its causes.

iii. Corrective Steps that Have Been Taken and Results Achieved

- a. Elimination of the backlog of Salem and Hope Creek UFSAR change notices is in progress. Approximately 80% of the backlog change notices previously identified to licensing have been closed. A review of Technical Specification Amendments will be conducted to verify the status of required UFSAR changes and ensure compliance with 10 CFR 50.71(e)(4). The majority of change notice closure actions have had a relatively minor impact on the underlying system's licensing basis.
- b. A letter was distributed to UFSAR copyholders listing outstanding current revision cycle and backlog UFSAR change notices. This letter stated that the list should be consulted when reviewing the UFSAR for 10 CFR 50.59 safety evaluations.
- c. The Corrective Action Program initiatives previously discussed involve corrective action weaknesses relative to this violation. Specifically, the issues of timely problem identification and effective corrective action development and implementation have been addressed by the Corrective Action Program.
- d. The Positive Discipline Program has been implemented as appropriate for personnel involved with this issue.
- e. A lessons learned meeting was held with licensing personnel to reinforce expectations, relative to problem identification, documentation and resolution.

iv. Corrective Steps that Will Be Taken to Avoid Further Violations

- a. The Salem and Hope Creek UFSAR change notice backlog elimination will be completed by October 31, 1995.
- b. Updates to the Salem and Hope Creek UFSARs will be issued upon elimination of the change notice backlog.

These updates will be issued by December 31, 1995.

- c. Procedures will be reviewed and revised to correct deficiencies that contributed to the creation of the UFSAR change notice backlog. These revisions will include clear definition of responsibilities and accountability. The procedure revisions will be completed by November 30, 1995.

v. Date When Full Compliance Will Be Achieved

Full compliance will be achieved upon issuance of the Salem and Hope Creek interim UFSAR updates. These activities are currently scheduled to be completed by December, 1995.

D. Violation D

1. Description of the Notice of Violation

"Hope Creek Technical Specification 6.8.1 requires, in part, that applicable procedures be implemented, including electrical system operating procedures as described in Appendix A to Regulatory Guide 1.33. Hope Creek system operating procedure, HC.OP-SO.PG-0001(Q) Revision 1, '480 Volt Electrical Distribution System,' in part provided a caution to operators to strip the bus of its associated loads prior to switching the power sources for the bus.

Contrary to the above, on March 23, 1995, with the unit in a cold shutdown condition, operators attempted to switch the power supplies for the 480 volt Unit Substation, 00B180, without first stripping the loads in accordance with the operating procedure, which in turn led to a loss of power to the affected bus and a resultant loss of shutdown cooling capability.

This is a Severity Level IV violation (Supplement 1)."

2. Response to Notice of Violation

PSE&G has reviewed the circumstances described by the NRC and concurs with the facts cited in the violation.

i. Discussion

The descriptions and analysis of this occurrence, causes of the occurrence, evaluation of safety significance and corrective actions are accurately stated in Hope Creek LER 95-006-01, dated June 20, 1995.

ii. Status of Corrective Actions

The primary cause of the March 23, 1995 loss of shutdown cooling event was procedural non-compliance. Control room personnel did not perform the bus transfer as specified in operating procedures. As a corrective measure, and as indicated in the LER, personnel involved in the procedural non-compliance were disciplined as appropriate.

However, on July 8, 1995, a shutdown cooling bypass event occurred which significantly degraded the shutdown cooling mode of the residual heat removal system. The description of this event is documented in Hope Creek LER 95-016-00, dated August 9, 1995. As stated in that LER, the primary causal factor of that event also involved procedural non-compliance by control room personnel. Additional corrective actions were developed to address the issue of procedural non-compliance. These additional corrective actions consist of the following:

- a. A common cause analysis team has reviewed the recent increase in operator errors. Improvement recommendations identified as a result of this review are being evaluated. This evaluation will be completed by September 30, 1995;
- b. A performance indicator to measure procedural compliance has been established by the Hope Creek Operations Department; and
- c. Focused control room observations have taken place to evaluate procedural compliance of shift personnel. These observations are being assessed to identify required corrective actions. This assessment will be completed by September 30, 1995.

Required corrective actions identified by these three activities will be implemented as appropriate in order to improve procedural compliance.