Public Service
Electric and Gas
Company

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MAY 07 1996

LR-N96106

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

REPLY TO A NOTICE OF VIOLATION
INSPECTION REPORT NO. 50-354/95-19
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 April 8, 1996.

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

Sincerely,

Louis F. Storz

Attachment

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ATTACHMENT

REPLY TO NOTICE OF VIOLATION
INSPECTION REPORT NO. 50-354/95-19
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354 **LR-N96106**

I. INTRODUCTION

During an NRC inspection conducted between November 9, 1995 and December 21, 1995, violations of NRC requirements were identified. As a result, the NRC issued a notice of violation for two violations in a letter dated April 8, 1996.

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: (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.

II. REPLY TO THE NOTICE OF VIOLATION

In this response, the failure to implement effective corrective actions for the Residual Heat Removal (RHR) Shutdown Cooling line will be referred to as Violation A and the failure to update the Safety Auxiliaries Cooling System (SACS) minimum temperature description in the Hope Creek Updated Final Safety Analysis Report (UFSAR) in accordance with 10CFR50.71(e) will be referred to as Violation B.

A. Violation A

1. Description of the Notice of Violation

"10 CFR 50, Appendix B, Criterion XVI 'Corrective Action' requires that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, as of December 15, 1995, the licensee did not establish measures to assure that conditions adverse to quality were promptly identified and corrected. Specifically, the licensee experienced a series of snubber failures over a period of three cycles as a result of failing to take appropriate corrective action to ameliorate high forces on the residual heat removal piping system that damaged the piping support system. During refueling outages in 1992

and 1994, the licensee found failures of the residual heat removal snubbers on the common suction line due to hydraulic overloads on the system. During the 1994 refueling outage the licensee determined several corrective actions which were necessary to ameliorate the high hydraulic loads. However, the corrective actions were not implemented.

This is a Severity Level III 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. Details associated with this event were previously provided in LER 354/95-038, and its supplements.

i. Description of Event

Discussion of Historical Failures

In accordance with Technical Specifications, snubber 1-P-BC-049-H042 was surveillance tested during Refueling Outage (RFO) 4 and failed the surveillance. The snubber was replaced and a stress evaluation was completed which demonstrated that the design requirements of the system were maintained in the "as found" condition.

During RFO 5, Snubber 1-P-BC-049-H042 was again tested as required by Technical Specifications and failed its surveillance. A walkdown of the common suction piping was conducted and magnetic particle examination of a pipe elbow was performed with satisfactory results. An evaluation was performed that demonstrated that the design requirements of the system were maintained in the "as found" condition.

Engineering conducted an evaluation to determine the probable cause and corrective actions to prevent future damage to the RHR shutdown cooling snubber. Based on this evaluation, Engineering determined that the damage was likely the result of water hammer. Changes to the system operating procedure were recommended to preclude additional failures. The changes were related to initial system filling and venting and to actions to prevent system transients following a system shutdown or isolation. Although the recommendations were discussed with Operations, they were not entered into the Action Tracking System. The recommendations were consequently not implemented.

Discussion of Actions to Investigate and Evaluate the Latest Failure

Snubber 1-P-BC-049-H042 was discovered to be failed during functional testing in RFO6. This failure was identified and evaluated under the enhanced Nuclear Business Unit (NBU) Corrective Action Program (CAP). A root cause analysis has been completed. Associated corrective actions are being implemented.

Actions taken to investigate and evaluate the latest snubber failure are described as follows. A walkdown of the system was performed to assess potential damage to the piping as a result of overload conditions on the piping supports. Welds on two pipe elbows, on both sides of the snubber, were examined by magnetic particle examination and were determined to be satisfactory. An engineering evaluation was subsequently completed to assess the structural integrity of the piping. This report concluded that the piping and components supported by the failed snubber were not significantly affected by the failure and remained capable of meeting design service in the "as found" condition. Additional walkdowns and magnetic particle examinations of integral welded attachments were completed in January 1996. The pressure boundary in the vicinity of the welded attachments was found to be satisfactory.

ii. Reason for Violation

The root cause of the first repeat failure was failure to perform a root cause analysis as a result of: 1) not recognizing the significance of the issue and a lack of questioning attitude on the part of personnel involved and 2) a weak corrective action process that did not contain a sufficiently low threshold for problem identification.

The root cause of the second repeat failure was lack of follow through with the Engineering recommendations which were developed to disposition the discrepancy report. The lack of follow through was the result of: 1) a weak corrective action process and 2) inadequate interface between Engineering and Operations in that the recommendation was not tracked.

iii. Corrective Steps That Have Been Taken and Results Achieved

The corrective actions that address the root causes of the repeat failure concern are comprehensive and have been underway since July 1995. They are described below.

Implementation of an Enhanced Corrective Action Program

a. A consolidated Corrective Action Program (CAP) has been implemented to communicate NBU management expectations on timely problem identification and resolution. The new program provides clear definition of roles and responsibilities. The CAP was designed using input from other utilities. The program includes a low threshold for reporting problems, provides aggressive problem assessment/root cause determination expectations and places management in charge of root cause and corrective action completion times.

The Director - Quality Assurance/Nuclear Safety Review has oversight responsibility for the CAP. He has dedicated resources, under the Manager - Corrective Action and Quality Services, to fulfill that responsibility. Measures have been established to monitor the performance of the corrective action process and Station management receives reports on overdue actions.

Accountability for CAP implementation rests with station line management. As such, station managers review root cause evaluations for completeness and adequacy. A Corrective Action Review Board (CARB) has been established at Hope Creek. The General Manager - Hope Creek Operations is its chairman. Completed root cause assessments for significant issues are presented to the CARB for evaluation of the adequacy of the cause determination and corrective actions. A performance measure has been established which tracks the acceptance/rejection rate for CARB presentations. This indicator is included in the monthly report to senior management.

In summary, the NBU CAP has been significantly enhanced and provides comprehensive corrective actions to address the repetitive snubber failure. Aspects of the program that relate specifically to the subject failure include the following. The program contains a low threshold for reporting problems. Corrective actions

are assigned to a responsible manager with a scheduled completion date. The corrective action tracking record cannot be closed until all actions are complete. Due date extensions are strictly controlled and all records receive a closure review by the responsible manager to verify that specified actions are tracked and that actions specified have been completed and are effective. Prior to final closure, the Corrective Action Group performs a review to verify all specified actions, including effectiveness reviews, have been properly completed.

b. The need for a questioning attitude has been repeatedly communicated to Hope Creek personnel and has created a heightened awareness of its importance at the station. A measure of the improvement in this area is the large number of Action Requests being written by Hope Creek personnel.

Failure Being Addressed Under the New CAP

The latest snubber failure was identified, evaluated, and is being tracked under the new Corrective Action Program. The root cause analysis has been completed and corrective actions to preclude repeat failures have been identified, assigned, and are being implemented. Details associated with this event were previously provided in LER 354/95-038, and its supplements. Corrective actions include the following:

a. The procedure changes expected to preclude recurrence of void-related water hammer events have been made.

b. Corrective actions to avoid unnecessary shutdown cooling isolations and the associated potential for water hammer events have been identified and assigned.

c. The RHR valve closing times have been reviewed to determine if changes can be made to eliminate potential depressurization scenarios. Engineering has determined that the valve closing times should not be changed; however, procedural changes have been made to enhance recovery from potential depressurization scenarios.

d. The shutdown cooling system has been reviewed to identify unintended leak paths that could depressurize the shutdown cooling suction line. A sample of these valves were tested for leakage with satisfactory results.

e. A walkdown was performed in December 1995 to assess the condition of the piping as a result of overload conditions on the piping supports. Welds on two pipe elbows on both sides of the snubber were examined by magnetic particle examination and determined to be satisfactory.

f. An engineering evaluation was completed to assess the structural integrity of the piping. This report concluded that the piping and components supported by the failed snubber were not adversely affected by the failure and remained capable of meeting the design service in the "as found" condition.

g. Walkdowns and magnetic particle examinations of integral welded attachments were conducted in January 1996. The pressure boundary in the vicinity of the welded attachments was found to be satisfactory.

h. A visual examination and a functional test on Snubber 1-P-BC-049-H042 were satisfactorily completed following the removal of shutdown cooling from service at the ned of the 6th refueling outage.

i. FPI performed a computer-based water hammer hydraulic transient analysis to determine the effect of the pressure pulsations in the shutdown cooling line produced by the postulated water hammer scenarios. This analysis included consideration of the as-built configuration of the ASME Class 1 sections and appropriate ASME Class 2 sections of the shutdown cooling line. Using the output from the hydraulic transient analysis, a piping stress analysis was performed. Peak water hammer pressures and forces were determined and a bounding case for the historical events was derived using the snubber/hanger damage evidence and other data collected.

The results of the computer analysis indicate that the ASME Class 1 piping sections and the appropriate ASME Class 2 sections satisfy the Code stress allowable values. The suspected highest stress piping section identified in the analysis was inspected for potential cracking and to determine actual component thickness. The results of this inspection showed no component damage and allowed the analysis to be updated based on the actual thickness.

A review of the cyclic stresses resulting from the water hammer events does not change any of the conclusions of the design calculation for this Class 1 section of piping, except for increasing the fatigue cumulative usage factor by not more than 2%. The previous cumulative usage factor was 3.7%, resulting in a total usage factor of less than 6%.

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

The actions stated in part (iii) above are considered to be sufficient to avoid further violations.

v. Date When Full Compliance Will Be Achieved

Based on the restoration of the snubbers, implementation of the new CAP, and the completion of the investigation into this issue as documented in this violation response and in LER 354/95-038-02, full compliance has been achieved.

B. Violation B

1. Description of the Notice of Violation

"10 CFR 50.71(e) requires, in part, that each person licensed to operate a nuclear power reactor pursuant to the provisions of 50.21 or 50.22 of this part shall update periodically, as provided in paragraphs (e)(3) and (4) of this section, the final safety analysis report (FSAR) ... The updated FSAR shall be revised to include the effects of: all changes made in the facility or procedures as described in the FSAR; all safety evaluations performed by the licensee either in support of requested license amendments or in support of conclusions that changes did not involve an unreviewed safety question.

Contrary to the above, as of December 15, 1995, the licensee had not updated the FSAR periodically, as provided in paragraphs (e)(3) and (4) of 10 CFR 50.71. Specifically, the safety auxiliaries cooling system, which was originally designed to operate at a minimum temperature of 65 degrees F, was repeatedly operated for almost a decade at temperatures less than the prescribed minimum reflected in the FSAR. The licensee identified that they were operating outside of the FSAR. HCGS engineering performed an evaluation and found that operating at a temperature below that specified in the FSAR was acceptable. However, the licensee had not made the

required changes to the FSAR. This was identified by the licensee during startup in 1986 and 1991.

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. Details associated with this event were previously provided in LER 354/95-037.

i. Description of Event

On November 6, 1995, a Problem Report (PR) was initiated because the 'A' Safety Auxiliaries Cooling System (SACS) Heat Exchanger outlet temperature had dropped below the UFSAR described design limit of 65°F.

As a result of this PR, the Nuclear Design Engineering (NDE) organization initiated a review of the minimum operating temperature requirements for SACS. On December 4, 1995, a determination was made that the documented piping stress analysis for SACS could not support operability at temperatures below 65°F. 'A' SACS was then declared inoperable, although it remained in service. 'B' SACS was already inoperable for scheduled maintenance.

On December 9, 1995, NDE completed a more detailed review and evaluation of piping stress calculations of SACS components and concluded that SACS can be operated at temperatures as low as 32°F without jeopardizing system integrity. This review was documented in letter NE-95-2133 and provided to the Senior Nuclear Shift Supervisor. The 'A' SACS loop was declared operable, but not in conformance with its design basis documents.

ii. Reason for Violation

The cause of the failure to update the UFSAR in a timely manner was lack of implementation of the required corrective actions because of inadequacies in the then existent Corrective Action Program.

iii. Corrective Steps that Have Been Taken and Results Achieved

a. A new Corrective Action Program has been implemented and provides an improved mechanism for identifying specific responsibilities related to Conditions Adverse to Quality. This Corrective Action Program increases the focus of the appropriate personnel toward the resolution of Conditions Adverse to Quality and provides increased emphasis on accountability regarding timely completion of evaluations and implementation of corrective actions.

b. The previously assigned action items related to discrepancies between SACS operation and design bases have been resolved and approved for incorporation into the UFSAR and other design basis documents.

c. SACS system testing procedures were reviewed to assure that the parameters in the test procedures were consistent with the information in the UFSAR. No other discrepancies were discovered through this review. An additional review has been initiated to determine if other systems are operating outside of the UFSAR description.

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

a. The Engineering Support Program Operating Experience Feedback training program for the second quarter of 1996 includes a discussion on design basis issues. Emphasis is placed on verifying that there is consistency between procedures and the UFSAR. Emphasis is also placed on the need to ensure that the UFSAR is updated after discovering discrepancies. This training is in progress and will be completed by June 30, 1996.

b. As previously discussed in LER 354/96-006, a review of Engineering Evaluations, open Discrepancy Evaluation Forms (DEFs), open Design Change Requests, open Design Change Packages, and a percentage of closed DEFs is in progress for selected safe shutdown and risk significant systems. This review includes a review to determine if any design basis issues were identified and if they were resolved and/or included in the Corrective Action Program. The results of this review will be provided in a supplement to LER 354/96-006.

v. Date When Full Compliance Will Be Achieved

The referenced operating procedures were approved on March 4, 1996. The appropriate changes had been approved for incorporation into the UFSAR prior to that date; and a UFSAR change notice has been issued. Full compliance will be achieved by September 25, 1996, when the next revision of the UFSAR is published.