

Public Service
Electric and Gas
Company

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JAN 02 1996

LR-N95175

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

Gentlemen:

**REVISED REPLY TO NOTICE OF VIOLATION
MISSED TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS
INSPECTION REPORT NO. 50-354/95-11
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 (HCGS) in a letter dated September 19, 1995.

The details concerning these issues are documented in Licensee Event Report (LER) 95-017-00 entitled "Inadequate Testing of Emergency Bus Undervoltage Logic Circuitry - Missed Surveillance Test, Diesel Generators Inoperable," dated August 11, 1995, and LER 95-018-00 entitled "Missed Surveillance Test Due to Procedure and Personnel Error - Automatic Depressurization and High Pressure Coolant Injection Systems Inoperable," dated August 17, 1995.

Also, as requested, this letter provides a comprehensive description of HCGS's planned corrective actions to improve our current Surveillance Requirement Program.

In addition, this letter, revised as noted, responds to your November 24, 1995 correspondence regarding your concern with the comprehensiveness and timeliness of the immediate corrective actions related to the July 1995 discovery of inadequate surveillance testing of the Emergency Bus Undervoltage Logic Circuitry.

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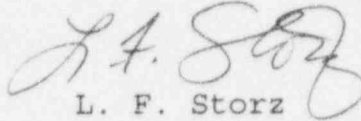
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Should you have any questions or comments on this transmittal, do not hesitate to contact us.

Sincerely,



L. F. Storz
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Attachment (1)



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ATTACHMENT

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MISSED TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS
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I. INTRODUCTION

Recent performance at Hope Creek has resulted in a significant number of Licensee Event Reports (LERs) relative to missed surveillance activities. As a result of this Technical Specification (TS) surveillance testing performance, the Technical Specification Surveillance Improvement Program (TSSIP) project has been initiated by the General Manager of Hope Creek Generating Station (HCGS). The project will be completed by a multi-disciplinary team consisting of approximately 5 to 6 Nuclear Business Unit (NBU) staff and contract personnel on a full time basis.

In support of this project, a review of the LERs related to missed TS surveillance requirements has been performed. The main contributing factors to the missed TS surveillance requirements are inconsistencies between surveillance procedures or scheduling requirements and the TS requirements, such as:

- * Incorrect periodicity of the surveillance;
- * Incorrect operational condition in which the surveillance should be performed;
- * Omission of a component from a system test; and
- * Incorrect testing methodology.

The charter of the TSSIP project is to compare the TS requirements of section 4.0 (with the exception of section 4.0.5 requirements) to the surveillance procedures to verify that all requirements are met. This comparison will include verification that:

- * Procedures test the entire scope of the TS system (channel, logic system, etc.), including inputs, sensors, indicators, alarms and trip functions as applicable,
- * Numerical values, setpoints, tolerances, calculations, graphs, figures and tables included or referenced in the procedures are consistent with values specified in the TS,

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Revised Reply to Notice of Violation

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- * Procedure steps, including prerequisites and special conditions (i.e. any operational condition restriction), associated with satisfying TS Surveillance Requirements are correct and identified in the procedure,
- * Procedures satisfy the intent of the surveillance requirement as stated in the TS Bases,
- * Procedure acceptance criteria satisfy the TS surveillance requirements and acceptance criteria have referenced bases, and
- * The computerized surveillance scheduling program correctly identifies the required frequency and Operational Condition for performance.

This program is being closely modelled after the TSSIP effort recently completed at Washington Public Power Supply System (WNP-2). Bases packages will be prepared for each TS Surveillance Requirement. We are confident that this project will resolve deficiencies associated with missed or improperly performed TS surveillance requirements.

II. REPLY TO THE NOTICE OF VIOLATION

1. Description of the Notice of Violation

"Hope Creek technical specification 4.0.2 requires in part, that each 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, during the period of July 13 to 20, 1995, certain surveillance requirements were not performed within the specified intervals, including the maximum allowable extension, as stated in the following examples:

- (i) Hope Creek technical specifications 4.8.1.1.2.h.4.a and 6.a require in part, that each diesel generator be demonstrated operable at least once per 18 months during shutdown, by simulating a loss of offsite power and verifying load shedding from the emergency busses. On July 13, 1995, it was determined by the licensee that surveillance testing omitted complete verification of the circuits associated with the vital bus load

shedding in response to the loss of offsite power signals. Specifically, overlap testing between bus loss of power auxiliary relays and the individual load breaker trip circuits had never been adequately demonstrated since initial plant licensing.

- (ii) Hope Creek technical specification 4.3.3.1 requires in part, that each ECCS actuation instrumentation channel shall be demonstrated operable by the performance of a quarterly channel functional test. On July 20, 1995, it was determined by the licensee that various specified ECCS actuation instrumentation channel functional tests were not completed within the specified intervals for the following three examples:
- (1) on June 6, 1995, the condensate storage tank level-low instrument channel functional test for the HPCI system suction swap was improperly credited by the completion of a suppression pool level-high instrument channel calibration;
 - (2) on June 29, 1995, the "C" RHR and "A" core spray pump discharge pressure-high permissive instrument channel functional tests for the automatic depressurization system were improperly credited by the completion of an "A" RHR pump discharge pressure-high permissive channel calibration; and,
 - (3) on June 29, 1995, the "B" and "D" RHR pump discharge pressure-high permissive instrument channel functional tests for the automatic depressurization system were improperly credited by the completion of an "B" core spray pump discharge pressure-high permissive channel calibration."

Discussion for Example i:

2a. Reason for Violation

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

On July 13, 1995, a review of surveillance testing was performed in response to the discovery of drawing discrepancies regarding loss of power (LOP) logic descriptions. After review of the existing surveillance testing procedures used to perform the load shedding for the vital busses against the criteria of Information Notice 95-

15, "Inadequate Logic Testing of Safety Related Circuits," dated March 7, 1995, it was revealed that the testing performed to verify TSS 4.8.1.1.2.h.4.a and 6.a was incomplete. These TSS address diesel generator testing and require the simulation of a LOP, and a LOP in conjunction with an Emergency Core Cooling System (ECCS) actuation test signal. The overlap in the surveillance testing did not adequately test all segments of the circuits associated with load shedding in response to a LOP signal. Specifically, the load shed that is initiated upon bus undervoltage (one-out-of-two-taken-twice logic) had not been functionally tested (i.e., there was no test procedure that provided an input to this logic and verified the desired output (load shedding) occurred as required). While all the relays in the circuits were cycled during testing, a small number of the relay contacts and their associated functions were not fully tested.

Since operability of the load shedding feature had not been demonstrated, the four diesel generators were declared inoperable in accordance with TSS at 2100 hours on July 13, 1995. Upon declaring the diesel generators inoperable, operating shift personnel reviewed and discussed TSS 3.8.1.2 and 4.0.3. At the time, the operating shift personnel considered TS 4.0.3 to be governing, with TS 3.8.1.2 to be invoked following the twenty-four hour grace period allowed by TS 4.0.3. Both TS were entered on the Limiting Condition for Operation (LCO) log.

Following discussions among operating shift personnel and various department representatives, at approximately 0830 hours on July 14, 1995, it was determined that the governing TS was 3.8.1.2, and not 4.0.3. With four diesel generators inoperable, the minimum A.C. power sources required to be operable by TS 3.8.1.2 were considered to be functional but not operable in accordance with TSS. The associated action statement requires, in part, the suspension of core alterations, suspension of handling of irradiated fuel in the secondary containment, suspension of operations with a potential for draining the reactor vessel, and suspension of crane operations over the spent fuel storage pool when fuel assemblies are stored therein. When the LCO form was updated to reflect the correct governing TS, the required actions were not captured. Compliance with the required actions was verified although controls were not established.

The untested undervoltage auxiliary contacts used for load shedding were reviewed by the system manager. A test procedure was created that performed a functional test of 4.16 kV load shedding to satisfy Surveillance Requirements 4.8.1.1.2.h.4.a and 6.a. This test provided an input signal

to the undervoltage relay logic and verified that the associated load was shed from the vital bus as required. This test was conducted satisfactorily. The "C" diesel generator was declared operable at 1300 hours on July 16, 1995. The "A" diesel generator was declared operable at 1130 hours on July 17, 1995. The return of the "A" diesel generator to operable condition restored the required minimum A.C. power sources of two as required by TSs in Operational Condition 4. The "B" and "D" Emergency Diesel Generators were also tested satisfactorily. In addition, the system manager verified the balance of the contacts related to the undervoltage logic scheme were functionally tested.

As reported in LER 95-017-00, dated August 11, 1995, the cause of this event was procedural inadequacy. A contributing cause was inadequate review of operating experience feedback of previous similar occurrences at other facilities. The test procedures did not provide sufficient overlap to ensure that TS requirements were met for the complete circuit. Failure to test segments of these circuits is attributed to inadequate technical input and review during the development of these test procedures. The error was not identified during subsequent reviews of the procedures since those reviews focused on the specific changes in that revision.

During the system manager's review of the July 13, 1995 occurrence, using the guidance provided in Information Notice 95-15, PSE&G questioned the methodology for the logic system functional tests required per Technical Specification 3/4.3.3, "Emergency Core Cooling System Actuation Instrumentation" (i.e., was verification that **every** contact of the **auxiliary** relays changed state required?). PSE&G's position at that time was that the requirements of a Logic System Functional Test were being satisfied with current procedures. However, due to the varied interpretations throughout the industry regarding what constitutes adequate overlap testing, the resolution of the Logic System Functional Testing concern to test all contacts was assigned to the Technical Specification Surveillance Improvement Program (TSSIP) effort.

The question regarding the adequacy of that testing (i.e., verifying every contact changed state) methodology with respect to Technical Specification 3/4.3.3 was documented in PSE&G's Corrective Action Program (CAP). This was so that potential deficiencies in the methodology could be identified and addressed prior to or during Hope Creek's sixth refueling outage, scheduled to begin on November 10, 1995.

The basis for operability of the Emergency Diesel Generators for undervoltage initiation was the satisfactory functional tests of the previously untested segments of the load shed function and the verification of the control functions of the auxiliary relays associated with the undervoltage circuit. This testing supported the conclusion that the Emergency Diesel Generators would have been capable of performing their intended safety functions if called upon. Reasonable assurance of operability was also demonstrated by the successful performance of the Loss of Power/Loss of Coolant Accident (LOP/LOCA) test over the last 6 cycles. The timing for follow-up to the question of adequate testing is believed to be consistent with Generic Letter 91-18, Section 6.1 based on the strength of our reasonable assurance at the time. It should also be noted that this time frame is consistent with the guidance provided in the draft Generic Letter for testing of safety-related logic circuits. This draft Generic Letter requests completion of a Technical Specification Surveillance procedure review for safety-related logic circuits by the first refueling outage commencing 90 days after issuance of the Generic Letter.

In conclusion, PSE&G believes that the corrective actions taken in response to the July 1995 discovery of inadequate surveillance testing of the Emergency Bus Undervoltage Logic Circuitry were comprehensive and timely based upon judgement of the information available at the time. The November deficiency was self-identified by PSE&G through implementation of a follow-up action put in place as a result of the July event, namely TSSIP. The TSSIP process assures that surveillance deficiencies are identified and corrected, which was the case with the Logic System Functional Testing of the Emergency Diesel Generator start, load shedding and sequencing logic.

TSSIP's review of Technical Specification surveillance testing, including Technical Specification 3/4.8.1.1 and 3/4.3.3, is ongoing. PSE&G expects that TSSIP will identify additional inadequacies in surveillance testing. These additional findings will be appropriately reported to the NRC. PSE&G believes that completion of the TSSIP will preclude future surveillance testing deficiencies.

3a. Corrective Steps That Have Been Taken and Results Achieved

- a. Test procedures were prepared and previously untested segments of the circuits were tested satisfactorily.
- b. This event was reviewed with Licensed Operating personnel with focus on the applicability of TS 4.0.3 and the requirement to implement positive controls when

directed by TSSs. In addition, personnel involved have been counseled regarding the appropriate level of personal accountability.

- c. The existing process for reviewing operating experience feedback (OEF) for applicability to Hope Creek was completed by an independent consultant. Recommendations from this review have been evaluated for implementation based upon the value added to the OEF process. Those recommendations that will improve the quality of the OEF process will be implemented by February 28, 1996. These recommendations will improve OEF coordination between NBU departments, and result in a more timely review of OEF.
- d. The Technical Specification Surveillance Improvement Program (TSSIP) was initiated. Based on the TSSIP review of the Emergency Diesel Generator related logic circuits, on November 14, 1995, the TSSIP concluded that although the specified Logic System Functional Test procedure performs a macroscopic functional test of the Emergency Diesel Generator start load shedding and sequencing logic, more specific testing would be required to satisfy the definition and requirements of a Logic System Functional Test. Specifically, all logic paths for the bus undervoltage auxiliary relays, of which the load shedding relays are a subset, are required to be functionally tested. This occurrence is documented in LER 95-033-00, dated December 14, 1995.
- e. Procedure changes have been implemented to ensure the completeness of the Logic System Functional Tests for the undervoltage logic circuits.
- f. Testing of all vital busses demonstrated compliance with the Logic System Functional Test requirements for the undervoltage logic circuits, and showed all required relays and contacts to be operational.

4a. Corrective Steps that Will Be Taken to Avoid Further Violations

- a. Problems identified during implementation of the TSSIP will be appropriately communicated to the responsible department so that corrective actions can be taken. These corrective actions will prevent further violations. The TSSIP will be completed by 12/31/96.

5a. Date When Full Compliance Will Be Achieved

Full compliance was achieved upon proper completion of the following surveillance requirements on July 18, 1995:

- 1) Surveillance requirement 4.8.1.1.2.h.4.a, simulating a loss of offsite power by itself and verifying loss of power is detected and de-energization of the emergency busses and load shedding from the emergency busses, and
- 2) Surveillance requirement 4.8.1.1.2.h.6.a, simulating a loss of offsite power in conjunction with an ECCS actuation test signal and verifying loss of power is detected and de-energization of the emergency busses and load shedding from the emergency busses.

Discussion of Example ii:

2b. Reason for Violation

PSE&G has reviewed the circumstances described by the NRC and concurs with the facts cited in the violation, with the exception of the third example as discussed on page seven (7) of this response.

- (1) On June 5, 1995, with the plant in Operational Condition 1, credit was improperly taken for TS 4.3.3.1-1.3.c, functional testing of the HPCI Condensate Storage Tank (CST) low level suction transfer instrumentation channels, based on the performance of a single channel calibration. As discussed in LER 95-018-00, dated August 17, 1995, the credited functional test includes both CST level suction transfer instrument channels. The channel calibration procedure includes only one of these two instrument channels but allowed crediting of the functional test. The TS 4.3.3.1-1.3.c test interval was exceeded on July 6, 1995. HPCI was functional but inoperable per TS 4.3.3.1-1.3.c. TS 3.5.1.c Action Statement requires that with the HPCI System inoperable, the system be returned to operable status within fourteen days or be in at least Hot Shutdown within the following twelve hours. For reasons not related to this issue, the plant entered Operational Condition 4 (Cold Shutdown) on July 7, 1995. Operational Condition 3 (Hot Shutdown) was inadvertently entered on July 8-9, 1995, as reported in LER 95-016-01, dated October 2, 1995. The reactor steam dome pressure reached was less than 200 psig. HPCI is only required to be operable in Operational Condition 3 when steam dome pressure is greater than 200 psig. The functional test of the

missed channel was successfully performed on July 21, 1995, prior to entering Operational Condition 3 and reaching a steam dome pressure of 200 psig.

This inappropriately credited surveillance test was self identified during a review of functional test work history initiated following a similar occurrence on July 20, 1995, as discussed on page 7.

- (2) On November 13, 1991 and again on May 22, 1993, credit was improperly taken for functional testing of the Residual Heat Removal (RHR) "A" and "C" Pump Discharge Pressure (Automatic Depressurization System (ADS) Permissive) instrument channels based on the performance of a single channel calibration. The I&C Supervisor improperly allowed crediting of the functional test. ADS was functional but inoperable per TS 4.3.3.1-1.4.e until the next functional tests of the missed channels, performed successfully on December 12, 1991 and June 16, 1993.

The ADS circuits affected by these occurrences are part of the ADS initiation logic. Two initiation signals and one permissive signal are used to actuate ADS. These signals are reactor vessel low water level, high drywell pressure, and RHR and/or Core Spray (CS) pumps running. These permissive pump running signal indicates that RHR and/or CS is available to provide reactor vessel makeup water. In both of the above occurrences, two of the three pump running signals were functional but inoperable per TSs.

These inappropriately credited surveillance tests were self identified during a review of functional test work history initiated following a similar occurrence on July 20, 1995, as discussed in the next example.

- (3) On July 20, 1995, with the plant in Operational Condition 4 (Cold Shutdown), it was self identified during closure of surveillance test documentation that on June 28, 1995 an instrumentation functional test had been improperly credited as complete based on the performance of a channel calibration. The functional test included three instrument channel tests while the channel calibration includes only one of the three instrument channels required by the functional test. The surveillance would have been overdue on July 20, 1995. On July 8, 1995, for reasons not related to this issue, the plant entered Operational Condition 4. Operational Condition 3 was inadvertently entered on July 8-9, 1995, as reported in LER 95-016-01, dated

October 2, 1995. The reactor steam dome pressure reached was less than 100 psig. ADS is only required to be operable in Operational Condition 3 when steam dome pressure is greater than 100 psig. Because ADS is not required to be operable in Operational Condition 4 or in Operational Condition 3 when the steam dome pressure is below 100 psig, the RHR Low Pressure Coolant Injection (LPCI) Mode Pump Discharge Pressure - High permissive for ADS is also not required to be operable. The improperly credited surveillance requirement was completed on July 21, 1995, prior to changing to Operational Condition 3 and reaching a steam dome pressure of 100 psig. Therefore, the improper credit of performed testing did not result in a violation of the HCGS TS Surveillance Requirements.

The cause of these events is procedural inadequacy and personnel error. Maintenance supervisory personnel together with the faulty functional test procedures improperly allowed crediting of a multi-channel functional test based on performance of a single channel calibration.

3b. Corrective Steps that Have Been Taken and Results Achieved

- a. As an interim corrective action, until procedural errors were corrected, a memo was immediately sent to all I&C Supervisors identifying the twelve functional tests which cannot be credited by completion of a single calibration.
- b. The HPCI functional test that was improperly credited on June 5, 1995 was satisfactorily performed on July 21, 1995 prior to reactor startup.
- c. All channel calibration procedures have been revised to include explicit directions regarding the crediting of the functional test based on performance of the channel calibration.
- d. For multiple channel functional tests, the planning and scheduling organization has added a precautionary note to the associated recurring task work orders to indicate that channel calibrations of multiple channels are required to credit the completion of the functional test.

4b. Corrective Steps that Will Be Taken to Avoid Further Violations

- a. Problems identified during implementation of the TSSIP will be appropriately communicated to the responsible

department so that corrective actions can be taken. These corrective actions will prevent further violations. The TSSIP will be completed by 12/31/96.

5b. Date When Full Compliance Will Be Achieved

Full compliance was achieved upon proper completion of:

- 1) Surveillance requirement 4.3.3.1-1.3.c, functional testing of the HPCI Condensate Storage Tank (CST) low level suction transfer, on July 21, 1995, and
- 2) Surveillance requirement 4.3.3.1-1.4.e, functional testing of the RHR "A" and "C" Pump Discharge Pressure ADS Permissive, on December 12, 1991 and June 16, 1993.