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Nuclear Business Unit

AUG 17 1995

LR-N95126

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

Gentlemen:

REPLY TO A NOTICE OF VIOLATION
SOUTH PLANT VENT RADIOLOGICAL RELEASE
INSPECTION REPORT NO. 50-354/95-05
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 July 20, 1995.

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

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The power is in your hands.

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ATTACHMENT

REPLY TO NOTICE OF VIOLATION
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INSPECTION REPORT NO. 50-354/95-05
HOPE CREEK GENERATING STATION
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I. INTRODUCTION

On April 5, 1995, the Hope Creek Generating Station experienced an unplanned release of radiological material from the south plant vent (SPV). On April 6-21, 1995, the NRC conducted an inspection of this release and four apparent violations of NRC requirements were identified. These apparent violations were described in NRC Inspection Report No. 354/95-05, dated May 30, 1995. On June 16, 1995, an enforcement conference was held to discuss these apparent violations. Subsequently, the NRC issued a notice of violation for four violations of NRC requirements in a letter dated 7/20/95.

The notice of violation describes the following four violations of NRC requirements: (1) failure to perform an adequate written safety evaluation to ensure that startup and operation of the decontamination solution evaporator (DSE) did not involve an unreviewed safety question; (2) failure to establish adequate procedures for ensuring proper operation of the DSE, as well as for limiting any releases to the environment; (3) failure to perform appropriate surveys and evaluations of the effluents released from the DSE to the SPV, and subsequently to the environment; and (4) failure to inform workers in a timely manner that the areas that they had worked in were contaminated. These violations have been categorized in the aggregate as a Severity Level III problem (Supplements I and IV).

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: (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 perform an adequate written safety evaluation will be referred to as Violation A, the failure to establish adequate operating procedures will be referred to as Violation B, the failure to perform appropriate surveys of DSE effluent will be referred to as Violation C and the failure to notify workers in a timely manner will be referred to as Violation D.

A. Violation A

1. Description of the Notice of Violation

"10 CFR 50.59(a)(1)(i) states, in part, the holder of a license may make changes to the facility as described in the safety analysis report, without prior Commission approval, unless the proposed change involves an unreviewed safety question.

10 CFR 50.59(b)(1) requires that the licensee maintain records of changes in the facility as described in the safety analysis report, and the records must include a written safety evaluation which provides the bases for the determination that the change does not involve an unreviewed safety question.

Hope Creek Final Safety Analysis Report (FSAR), Section 11.2.1.4, states that the Liquid Waste Management System (LWMS) design meets the requirements of General Design Criteria (GDC) 60 (Control of release of radioactive material to the environment). Further, FSAR Section 11.5.3 states that the requirements of GDC 64 (Monitoring radioactivity releases) are implemented with respect to effluent discharge paths.

10 CFR 50, Appendix A, Criterion 60, states, in part, that the nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents.

10 CFR 50, Appendix A, Criterion 64, states, in part, that means shall be provided for monitoring effluent discharge paths.

Contrary to the above, as of April 5, 1995, the written safety evaluations performed to support startup testing of the Decontamination Solution Evaporator (DSE), pursuant to Design Change Package (DCP) 4EC-3348 Packages 5 and 21, were inadequate in that they failed to identify, or review for acceptability, the facility's nonconformance with FSAR Sections 11.2.1.4 and 11.5.3. Specifically, the written safety evaluations did not provide a basis for determining that the lack of controls or monitoring for a potentially radioactive effluent vent path from the DSE did not constitute an unreviewed safety question."

2. Response to Notice of Violation

PSE&G does not dispute the violation.

i. Description of Event

In 1977, during the design of Hope Creek, PSE&G concurred with a design revision for the DSE which removed the evaporator condenser and routed the DSE effluent directly to the SPV. This change was made to avoid concentration of organics in condensate storage tank water and resulted in a relatively unique DSE design for Hope Creek. However, the basis for this revision to meet the requirements of GDC 60 and GDC 64 had not been adequately considered nor adequately documented.

In 1986, pre-operational tests were completed for the DSE utilizing procedures developed from vendor evaporator operations and maintenance information. In the same year, Hope Creek entered commercial operation and a decision was made not to use the DSE based upon economic considerations. Subsequently, the DSE remained dormant from 1986 to 1992.

In 1992, a radwaste equipment restart project was initiated to reduce the volume of radioactive solid and liquid waste. The purpose of Design Change Package (DCP) 4EC-3348 was to document a re-start and check out of these systems including the DSE. This DCP also provided a mechanism to perform minor changes to enhance system operations. DCP 4EC-3348, Packages 5 and 21, affected the DSE. The purpose of these packages was to perform test runs, identify operational problems and make changes to correct them. Package 5 was utilized for the initial start-up and test phase and Package 21 verified the operational condition of the DSE during the endurance run.

In October, 1994, the DSE was placed into semi-continuous service and operated until April 5, 1995. On April 5, 1995, a radiological release from the SPV caused by operation of the DSE occurred, and the DSE was subsequently removed from service.

ii. Reason for Violation

The principal causes for the DCP's safety evaluation deficiency are attributed to a lack of recognition of the poor design of the DSE and a failure to perform a robust review of a dormant system re-start. Specifically, the lack of a DSE condenser and resulting operational implications were not adequately understood and the 50.59 safety evaluations for the DCP only focused on specific changes to the DSE during its re-start.

Attachment
Reply to Notice of Violation

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Contributing causes for this violation are attributed to the failure of DCP reviewers to fully question the implications of the original design on operation described in the 50.59 packages and to management oversight weakness.

iii. Corrective Steps That Have Been Taken and Results Achieved

- a. The DSE was tagged out-of-service and will not be restarted without a detailed system review by PSE&G and an opportunity for prior NRC review.
- b. A "hold" was placed on the re-start of the other dormant systems pending development of re-start guidelines.
- c. Other plant systems connected to ventilation release points were reviewed using lessons learned from the April 5, 1995, incident. No other inadequately monitored pathways were identified.
- d. A system functional review of other radwaste systems was initiated. This assessment will evaluate whether systems, structures and components were designed, installed, tested, operated, modified, maintained and managed in accordance with their design basis, applicable regulations, standards, codes and commitments.
- e. Group meetings were held with engineering personnel to reinforce the need to apply a questioning attitude and perform thorough reviews.
- f. Lessons learned meetings were held by the Hope Creek General Manager with plant staff.
- g. A human error, organization and management failure mode analysis of the design, safety evaluation, integrated assessment activities and management oversight was completed. This review identified a need to increase training for technical and safety reviewers and improve management oversight of design reviews.

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

- a. A plant-wide corrective action evaluation using experienced industry consultants and station staff will be conducted to identify plant performance weaknesses.

The findings of this evaluation will be assessed and appropriate corrective actions developed.

- b. Upon completion of the radwaste system functional review, identified corrective actions will be evaluated and implemented.
- c. The corrective actions identified in the human error, organization and management failure mode analysis will be implemented as appropriate to improve safety evaluations developed and reviewed as part of the DCP process.
- d. A system re-start guideline will be developed to provide guidance on performing robust reviews of dormant system's design basis.

v. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

B. Violation B

1. Description of the Notice of Violation

"Technical Specification 6.8.1 requires, in part, that applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, be established, implemented and maintained.

Appendix A of Regulatory Guide 1.33, Revision 2, recommends procedures for limiting release of radioactive materials to the environment, including operation of liquid radioactive waste systems.

Contrary to the above, as of April 5, 1995, the operating procedures for the DSE, a liquid radwaste system, were inadequate to provide for its proper operation of this liquid radioactive waste system, and to limit release of radioactive material from this system to the environment. The procedures were inadequate in that the operating procedure did not provide instructions for operation of the evaporator in a semi-continuous mode, and alarm response procedures did not provide direction for mitigation of high differential pressure across the evaporator demister."

2. Response to Notice of Violation

PSE&G does not dispute the violation.

i. Description of Event

The description of the DSE design and startup history is provided in Section II.A.2.i above. During the radwaste restart project, Revision 2 of the DSE operating procedure was approved, which made minor changes to the original pre-operational test procedures. Revision 2 of the DSE operating procedure was being used for the DSE endurance run initiated in October 1994.

The DSE operating procedure utilized at the time of the 4/5/95, event did not adequately include: 1) guidance for responding to a high delta pressure condition; 2) guidance for demister spray operation; 3) directions for transferring water from the floor drain collector tank to the chemical waste tank; 4) conditions requiring the shutdown of the evaporator; 5) prerequisite for SPV radiation monitor operability; 6) precautions regarding pressurization consequences; 7) sampling requirements; and 8) normal and maximum operating levels, operating temperatures and pressures. In addition, the DSE was being operated in a semi-continuous mode instead of a batch mode as design documents had indicated.

ii. Reason for Violation

The principal causes for the procedural deficiency are attributed to a lack of recognition of the poor design of the DSE and a failure to perform a robust review of a dormant system re-start. Specifically, the lack of a DSE condenser and resulting operational implications were not adequately understood and therefore were not addressed in the DSE operating procedure.

Contributing causes for this violation are attributed to the failure of DCP reviewers to fully question the implications of the original design on operation described in the 50.59 packages and to an inadequate interface among organizations responsible for the operating procedure development.

iii. Corrective Steps that Have Been Taken and Results Achieved

- a. The DSE was tagged out-of-service and will not be restarted without a detailed system review by PSE&G and an opportunity for prior NRC review.
- b. A "hold" was placed on the re-start of the other dormant systems pending development of re-start

guidelines.

- c. A system functional review of other radwaste systems was initiated. This assessment will evaluate whether systems, structures and components were designed, installed, tested, operated, modified, maintained and managed in accordance with their design basis, applicable regulations, standards, codes and commitments.
 - d. Group meetings were held with engineering personnel to reinforce the need to apply a questioning attitude and perform thorough reviews.
 - e. Lessons learned meetings were held by the Hope Creek General Manager with plant staff.
 - f. A human error, organization and management failure mode analysis of the design, safety evaluation, integrated assessment activities and management oversight was completed. This review identified a need to conduct a work optimization-failure rate analysis on the DCP process and increase training for technical and safety reviewers.
- iv. Corrective Steps that Will Be Taken to Avoid Further Violations
- a. Upon completion of the radwaste system functional review, identified corrective actions will be evaluated and implemented to address any noted procedural deficiencies.
 - b. A system re-start guideline will be developed to provide guidance on performing robust reviews of procedures associated with dormant systems.
- v. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

C. Violation C

1. Description of the Notice of Violation

"10 CFR 20.1302(a) requires that the licensee make, or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to

demonstrate compliance with the dose limits for individual members of the public in 20.1301. The licensee shall show compliance with the annual dose limits of 10 CFR 20.1301 by the methods outlined in 10 CFR 20.1302(b).

Pursuant to 10 CFR 20.1003, survey means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation.

Contrary to the above, as of April 5, 1995, the licensee's surveys and evaluations of the effluents released from the DSE to the SPV, and subsequently to the environment, were inadequate to ensure compliance with the requirements of 10 CFR 20.1302. The surveys and evaluations were inadequate in that the effluent monitoring system was not designed to detect radiological effluent in the form of steam and water that was released from the DSE to the environment via the SPV, resulting in the licensee being unaware of a release of an estimated 85 millicuries of radioactive material for approximately 14 hours."

2. Response to Notice of Violation

PSE&G does not dispute the violation.

i. Description of Event

The description of the DSE design and startup history is provided in Section II.A.2.i above. As stated in that section, the decision to remove the condenser from the design of the DSE, resulted in an effluent pathway through the SPV that did not meet the requirements of: 1) 10 CFR 50, Appendix A, Criterion 60, which requires suitable controls for the release of radioactive materials in gaseous and liquid effluents; and 2) 10 CFR 50, Appendix A, Criterion 64, which requires monitoring of effluent pathways.

The SPV RMS for the DSE design did not include an analysis of the DSE effluent normal or upset discharge physical form. Therefore, the capability of the SPV RMS design to conform with Hope Creek UFSAR descriptions, with respect to particulate monitoring, and industry guidance contained in ANSI N13.1, concerning vapor in gaseous effluents, was not ensured prior to the commercial operation of Hope Creek.

During the radwaste re-start project, neither an in-depth assessment of DSE effluents nor a detailed review of the SPV

RMS capabilities were included within the scope of the DCP packages developed for the DSE re-start. The DSE was subsequently placed in semi-continuous operation in October 1994 and operated until April 5, 1995. On April 5, 1995, radiological effluent in the form of steam and water was released from the DSE to the environment via the SPV. Although the SPV RMS was operable at the time of the release, it was not capable of detecting this type of release.

ii. Reason for Violation

The principal cause for the effluent monitoring system deficiency is attributed to an inadequate implementation of the initial design review and subsequent design review.

iii. Corrective Steps that Have Been Taken and Results Achieved

- a. The DSE was tagged out-of-service and will not be restarted without a detailed system review by PSE&G and an opportunity for prior NRC review.
- b. Other plant systems connected to ventilation release points were reviewed using lessons learned from the DSE incident. No other inadequately monitored pathways were identified.
- c. Group meetings were held with engineering personnel to reinforce the need to apply a questioning attitude and perform thorough reviews.
- d. Lessons learned meetings were held by the Hope Creek General Manager with plant staff.
- e. A human error, organization and management failure mode analysis of the design, safety evaluation, integrated assessment activities and management oversight was completed. This review identified a need to conduct a work optimization-failure rate analysis on the DCP process and increase training for technical and safety reviewers.

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

- a. The corrective actions identified in the human error, organization and management failure mode analysis will be implemented as appropriate to improve reviews as

part of the DCP process.

v. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

D. Violation D

1. Description of the Notice of Violation

"10 CFR 19.12 requires, in part, that all individuals working in or frequenting any portion of a restricted area be kept informed of the storage, transfer, or use of radioactive materials or of radiation in such portions of the restricted area and shall be instructed in the health protection problems associated with exposure to such radioactive materials or radiation and shall be instructed in precautions or procedures to minimize exposure. The extent of these instructions shall be commensurate with the potential radiological health protection problems in the restricted area.

Contrary to the above, on April 5, 1995, workers in a restricted area traversed and worked in radioactively contaminated areas immediately adjacent to, and south of, the Hope Creek turbine building, and the workers were not informed until April 6, 1995, that they had entered such areas. Such instruction to the workers was warranted because (1) the licensee did not know the nature and extent of potential personnel contamination received by the workers; and (2) portal radiation monitors used to monitor personnel exiting the areas could not readily detect the contamination."

2. Response to Notice of Violation

PSE&G does not dispute the violation.

i. Description of Event

On April 5, 1995, at approximately 0021 hours (time of the SPV radiological release), the reactor building vent exhaust and radwaste exhaust monitors had alarmed. Since the SPV RMS did not alarm, a release to the environment was not postulated at that time. Subsequent investigations into the cause and extent of the exhaust ductwork contamination led to confirmation that contaminated material, which had an isotopic match with DSE effluent, had been released to the environment. However, this confirmation did not occur until approximately 1600 hours on 4/5/95. The delay in this confirmation was caused by: 1) shift turnovers interrupting

investigations of the ductwork contamination; 2) reliance on the lack of an SPV RMS alarm to determine that a release had not occurred; 3) mis-interpretation of turbine building roof contamination survey results; and 4) poor inter-departmental and intra-departmental communications.

At approximately 1600 hours on 4/5/95, the outside yard was surveyed for contamination. At 1700 hours on 4/5/95, the Senior Nuclear Shift Supervisor (SNSS) was notified of contamination in the yard and Radiation Protection (RP) personnel were assembled and dispatched to continue the survey of the site. It was determined by the SNSS that no actions or notifications were needed in accordance with the Hope Creek Event Classification Guide.

Throughout the evening of 4/5/95 and in the early morning of 4/6/95, the outside yard areas were surveyed and the contaminated areas were posted. During this period, no contamination was detected at the Security Center or at offsite areas surveyed and no frisker monitors had alarmed inside the plant. In addition, vehicles possibly affected by the release were identified and later surveyed. One truck, located in Delaware, was confirmed to be contaminated at 0430 hours on 4/6/95 and a 4-hour report was made to the NRC.

During the morning of 4/6/95, workers arriving at the security center were notified of the contaminated areas and outside work was restricted. Workers potentially affected by the contamination were told to report to a muster-house for followup and a management meeting was held to discuss the significance of the incident with these workers. Followup actions included: 1) whole body counts for appropriate workers; 2) personnel dose assessments; 3) environmental dose assessments; and 4) worker home and vehicle surveys as appropriate. These actions did not identify any adverse findings.

ii. Reason for Violation

The principal cause for the failure to promptly notify workers of the radioactively contaminated areas was attributed to a lack of appropriate guidance for contamination controls outside of the Radiologically Controlled Area (RCA) where activity levels are less than the ECG action limits. The untimely diagnosis of the cause of the RMS alarms and delay in identifying the SPV release contributed to a lack of timely implementation of controls to notify affected workers and prevent the further spread of

the contamination.

iii. Corrective Steps that Have Been Taken and Results Achieved

- a. Development of site-wide guidance was initiated for response to radiological events outside the plant RCA, but on plant property. This guidance will address: 1) notification of appropriate personnel both onsite and offsite; 2) control of personnel and vehicles entering/exiting the site; 3) the extent of radiological surveys; the consideration of the need to recall personnel and/or vehicles that have left the site; 4) mitigation and recovery from the event; and 5) organizational responsibilities.
- b. Operations and Radiation Protection monitoring system alarm response procedures were enhanced to: 1) improve the interface between department procedures; 2) provide additional guidance on RMS limitations and validation; and 3) provide additional guidance on communication of findings.
- c. Lessons learned meetings were conducted by the Operations and Radiation Protection departments.
- d. Lessons learned meetings were held by the Hope Creek General Manager with plant staff.
- e. A human error, organization and management failure mode analysis of the design, safety evaluation, integrated assessment activities and management oversight was completed. This review confirmed the need to enhance radiation protection procedures and develop guidance for controlling contamination outside of the RCA.

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

- a. The site-wide guidance for response to radiological events outside the plant RCA will be completed and implemented.

v. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.