

December 23, 1999

Mr. Harold W. Keiser  
President and Chief Nuclear Officer  
PSEG Nuclear LLC  
Post Office Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: NRC INSPECTION REPORT 50-354/99-08

Dear Mr. Keiser:

On October 28, 1999, the NRC completed an inspection of your Hope Creek facility. This inspection encompassed both a baseline problem identification and resolution inspection and a review of recent problems in the licensed operator training area. The enclosed report presents the results of that inspection. The preliminary findings were presented to PSEG management on October 28, 1999 and a final exit was held on November 23, 1999.

This inspection was a review of activities conducted under your license as related to identification and resolution of problems; licensed operator training qualification and effectiveness; compliance with the Commission's rules and regulations; and, with the conditions of your license. Within these areas the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel. Negative findings were assessed using the significance determination process; all findings either "screened out" of the process or were determined to be within the licensee response band (Green).

Based upon the sample reviewed during this inspection, your identification of issues was appropriately being captured in your corrective action process. No significant findings were identified. However, as identified by your staff and the NRC, human performance issues, including failure to follow procedures, are of concern. A number of human performance issues have occurred throughout all departments at the station over the past couple of years. The NRC recognizes that you have rolled up all previously issued human performance problems into two station "notification reports" and that you are currently assessing the problem. Your actions in addressing these issues are subject to future NRC inspection activities.

Mr. Harold W. Keiser

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In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR).

Sincerely,

**ORIGINAL SIGNED BY  
BRIAN E. HOLIAN FOR:**

Wayne D. Lanning, Director  
Division of Reactor Safety

Docket No. 50-354

Enclosure: Inspection Report 50-354/99-08

cc w/encl:

L. Storz, Senior Vice President - Nuclear Operations  
E. Simpson, Senior Vice President and Chief Administrative Officer  
M. Bezilla, Vice President - Nuclear Operations  
D. Garchow, Vice President - Technical Support  
M. Trum, Vice President - Maintenance  
T. O'Connor, Vice President - Plant Support  
E. Salowitz, Director - Nuclear Business Support  
G. Salamon, Manager - Licensing  
A. F. Kirby, III, External Operations - Nuclear, Delmarva Power & Light Co.  
J. McMahon, Director - QA/Nuclear Training/Emergency Preparedness  
R. Kankus, Joint Owner Affairs  
A. Tapert, Program Administrator  
J. J. Keenan, Esquire  
Consumer Advocate, Office of Consumer Advocate  
W. Conklin, Public Safety Consultant, Lower Alloways Creek Township  
M. Wetterhahn, Esquire  
State of New Jersey  
State of Delaware  
J. Guinan, NJ PIRG  
N. Cohen, Coalition for Peace and Justice  
R. Fisher  
F. Berryhill  
B. August

Mr. Harold W. Keiser

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 50-354

License No: NPF-57

Report No: 50-354/99-08

Licensee: Public Service Electric & Gas Company

Facility: Hope Creek Nuclear Generating Station

Location: P.O. Box 236  
Hancocks Bridge, NJ 08038

Dates: October 18 - 28, 1999 and  
November 23, 1999

Inspectors: P. Bissett, Senior Operations Engineer  
D. Orr, Senior Resident Inspector (Part-time)  
K. Modes, Senior Radiation Specialist  
G. Cranston, Operations Engineer  
T. Fish, Operations Engineer  
R. Pelton, Human Performance Specialist, NRR

Approved By: R. Conte, Chief  
Human Performance and Emergency Preparedness Branch  
Division of Reactor Safety

## SUMMARY OF FINDINGS

### Hope Creek Generating Station NRC Inspection Report 50-354/99-08

The report covers a period of inspection by four Region based inspectors, one resident inspector, and one human performance specialist from NRR. This inspection, which was announced, included a review of Hope Creek's effectiveness in problem identification and resolution and a review of licensed operator training issues regarding poor initial examination results. The problem identification and resolution review was accomplished using the new baseline Inspection Procedure 71152, "Identification and Resolution of Problems." The licensed operator training review was conducted using the current Inspection Procedure 41500, "Qualification and Training Effectiveness," because of a significant problem in the operator licensing area within the last two years.

#### **Reactor Safety and Radiation Safety Issues**

No significant findings were identified.

#### **Problem Identification and Resolution**

No significant findings were identified. There was however, some concern regarding the number of human performance errors that have occurred within all departments at the station over the past two years. The team noted that during the inspection, previously identified human performance issues were all rolled up into one station notification that addressed the human performance issue. Along these lines, but under a separate notification, the team noted a roll up of another human performance issue that dealt specifically with station personnel failing to follow procedures. As identified by the licensee and the team, it was determined that ineffective corrective actions, regarding human performance errors, were attributable to some narrowly focused root cause analyses or to poor correlation of causes with corrective actions. These causes were similar to that noted in the training area (exam quality and written test results). Since improvement plans were being developed to address this area as of the end of the inspection, it was too early to assess the resolution to these problems and subsequent corrective actions. Follow up action is warranted in this area.

## Report Details

### **4. OTHER ACTIVITIES (OA)**

#### 4OA1.1 Identification and Resolution of Problems

##### a. Inspection Scope

The inspectors selected and reviewed 21 licensee “notification reports” that possibly could have an affect on one or more of the cornerstone objectives. The Physical Protection cornerstone was not reviewed, since it had been reviewed adequately in a previous inspection. The scope of review was to verify that the licensee had identified, resolved and corrected problems that were adverse to quality and were risk significant. Reviews were conducted in the areas of operations, maintenance, engineering, emergency planning, chemistry, radiation protection and quality assurance. Interviews were conducted with plant personnel as deemed necessary to accomplish assigned objectives. Observations of various plant activities were also performed to assess the effectiveness of notification reviews, disposition, and resolution.

##### b. Observations and Findings

No significant findings were identified, however, the inspectors noted a number of human performance errors that had occurred at Hope Creek over the past two years. These human performance errors also were not confined to any one department, but were across all departments at the station. During the inspection, Notification #20009989 was issued by the licensee in regard to the number of previously identified human performance issues. This notification was essentially a rollup of previously issued notifications that had been originally cause coded as subcategories of human performance, i.e., communications, procedural adherence, procedural inadequacies, STAR techniques, etc. Additionally, during this inspection, Notification #20010457 was issued which was a rollup of previously issued notifications dealing with station personnel failing to follow procedures. In essence, this notification was attributable primarily to human performance errors.

Licensee management, at the time of the inspection, was pursuing the development of action plans to address and correct both of the above mentioned issues.

#### 4OA1.2 Operating Experience Feedback

##### a. Inspection Scope

The inspectors observed the operating experience group’s review of nineteen various industry operating events to assess their applicability to Hope Creek operation. Also, additional reviews were conducted of previously generated and received industry operating events.

b. Observations and Findings

No significant findings were noted. The majority of industry events reviewed were assigned to various departmental personnel for further review or information only.

4OA1.3 Review Committees

a. Inspection Scope

The inspectors observed the conduct of a corrective action review board (CARB) in regard to their assessment of the root cause analysis and subsequent and recommended corrective actions for a plant event, "Loss of Feedwater Heating," Notification #20003538. Additional details in NRC Inspection Report No. 50-354/99-05. This particular event involved several human performance problems. Also, on several occasions, the inspectors observed the evaluations, categorization, operability evaluations, and disposition of notifications performed by the Work Management Center. These reviews were of notifications that had been issued within the past 24 hours.

b. Observations and Findings

No significant findings were identified in this area. The inspectors noted, however, that the CARB members were very aggressive, and inquisitive regarding the facts and analysis that were presented to the board. As a result, the CARB requested that additional work be done in assessing the root cause and recommended corrective actions for this particular event.

4OA1.4 Audits and Self-Assessments

a. Inspection Scope

The inspectors reviewed various departmental self-assessments, quality assurance surveillances and audits, and QA quarterly assessments that had occurred within the past two years. These reviews assessed departmental effectiveness in identifying problems and placing these problems into the corrective action program and subsequently resolving these identified issues.

b. Observations and Findings

No significant findings were identified in this area. The most recent quality assurance quarterly assessment and its presentation to station management did address the human performance issues, including failure to follow procedures, that had occurred within all departments at Hope Creek. Significant emphasis was placed in this area during various presentations to station management.

#### 4OA1.5 Licensed Operator Training

##### Training and Qualification Effectiveness (41500)

###### a. Inspection Scope

NRC staff identified examination performance issues related to exam quality and poor exam results during a February 1998 initial licensed operator examination. Although Hope Creek personnel performed a root cause determination in May 1998, the issues recurred during another initial exam administered in December 1998. The licensee and NRC staff then conducted independent assessments to determine underlying causes for the repeat issues. The NRC documented its findings in NRC Report 50-354/98-302, which concluded that the Nuclear Training Center (NTC) staff's implementation of the condition reporting process was deficient, in that corrective actions for exam problems were not effective.

During this inspection, the inspectors reviewed documents to determine why the exam problems repeated and assessed whether this recurrence was indicative of how effectively the licensee identified and corrected problems. Documents reviewed included an assessment the corrective actions group and quality assurance staff performed, and the two root cause determinations performed in April/May 1999 that again addressed the exam issues. The inspectors also verified completed corrective actions, where applicable, that NTC staff implemented in response to the April/May 1999 root cause determinations. The completed actions were 1) improved quality of biweekly exams given to the applicants; 2) assignment of mentors holding an NRC license to each applicant; and 3) improved remediation process.

###### b. Observations and Findings

On December 22, 1998, the Hope Creek corrective actions group issued a Level 1 Condition Report that identified the NTC staff was not adequately implementing the corrective action program (CR981221122). The report cited a number of recurring failures of NTC staff to follow corrective action procedures and noted suspected causes were lack of NTC commitment to program implementation and inadequate program monitoring and evaluation by NTC management. Later, in March 1999, Hope Creek's quality assurance staff issued an assessment which also identified NTC staff was not adequately implementing the corrective action program (Assessment Report 99-0050). The report specifically noted that corrective actions had not been effective in resolving operator training program deficiencies, including the deficiencies associated with the February and December 1998 initial license exams. The inspectors found no flaws with the findings and conclusions of these two assessments.

Independent of these documents, the inspectors selectively interviewed NTC staff, including the nuclear training manager, technical training manager, and operations training instructors. During these interviews, the inspectors obtained the following

licensee perspective: until the spring of 1999, NTC personnel were weak at using the corrective action process; they relied on contractors to help implement the process; and, they had limited skills at performing root cause determinations. The inspectors noted that the ineffective May 1998 root cause analysis was evidence that the training staff, at that time, was ineffective at identifying and resolving problems. In contrast, the inspectors observed the root cause determinations of April and May, 1999 were more effective and adequately addressed the problems associated with the February and December 1998 exams. The inspectors attributed the improved performance to initiatives the licensee implemented in response to the corrective action group CR and the quality assurance assessment. For example, the April/May root cause determination teams included a full-time, root cause expert; the May 1998 effort did not.

The inspectors determined problems from the February 1998 exam repeated on the December 1998 exam because NTC staff at that time did not know how to effectively implement the corrective action program and in particular were deficient in their ability to perform root cause determinations. The licensee, however, has since taken actions to correct these deficiencies. The inspectors concluded that the staff's ability to identify and resolve problems was adequate, since the Hope Creek organization self-identified, and took actions to correct, corrective action performance deficiencies within the training organization.

In summary, the corrective action program was not effective in the Nuclear Training Department as evidenced by the recurrence of exam difficulties. This was attributable to:

- Ineffective training management oversight of the problem;
- Deficient understanding of the corrective action program by the Nuclear Training Department;
- Insufficient oversight of the licensee contractors implementing the program; and
- Root cause evaluation and corrective actions that were not entirely on target.

The most recent root cause and corrective actions taken by the Corrective Action Group, Quality Assurance and the Nuclear Training Department following the December 1998 exam appear to be on target and appropriate for the identified causes. Effectiveness of the corrective actions will be evaluated based on the results of the next scheduled exam (May of 2000).

40A5      Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. J. Zudans and other members of the PSEG staff during an exit meeting on November 23, 1999. Preliminary inspection results had previously been presented to licensee personnel on October 28, 1999. The inspectors noted that no documents provided during the inspection were identified as proprietary. Licensee personnel acknowledged the information presented and agreed that no proprietary information was provided to the inspectors.

## PARTIAL LIST OF PERSONNEL CONTACTED

### Public Service Electric Gas

J. Carey, Manager, Employee Concerns Program  
T. Cellmer, Manager, Radiation Protection  
C. Frickel, Manager, Quality Assurance  
D. Miller, Manager, Corrective Action Program  
S. Miller, Lead Engineer-Nuclear  
G. Salamon, Manager, Licensing  
S. Nevelos, Supervisor, Corrective Action & Operating Events  
F. Sullivan, Director Engineering  
L. Wagner, Operations Manager  
J. Zudans, Manager, Engineering Programs

### NRC

G. Meyer, Branch Chief, DRP  
C. Holden, Section Chief, Inspections, NRR  
J. Shea, Reactor Engineer, NRR  
W. Lanning, Director, DRS

## INSPECTION PROCEDURES USED

IP 71152, "Identification and Resolution of Problems"  
IP 41500, "Training Qualification and Effectiveness"

# ATTACHMENT 1

## NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

<b>Reactor Safety</b>	<b>Radiation Safety</b>	<b>Safeguards</b>
! Initiating Events	! Occupational	! Physical Protection
! Mitigating Systems	! Public	
! Barrier Integrity		
! Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent little effect on safety. WHITE findings indicate issues with some increased importance to safety, which may require additional NRC inspections. YELLOW findings are more serious issues with an even higher potential to effect safety and would require the NRC to take additional actions. RED findings represent an unacceptable loss of safety margin and would result in the NRC taking significant actions that could include ordering the plant shut down.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. The color for an indicator corresponds to levels of performance that may result in increased NRC oversight (WHITE), performance that results in definitive, required action by the NRC (YELLOW), and performance that is unacceptable but still provides adequate protection to public health and safety (RED). GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, as described in the matrix. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.