U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No.	50-354/95-20
License No.	NPF-57
Licensee:	Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038
Facilities:	Hope Creek Nuclear Generating Station
Dates:	December 22, 1995 - February 10, 1996
Inspectors:	R. J. Summers, Senior Resident Inspector S. A. Morris, Resident Inspector J. H. Lusher, Emergency Preparedness Specialist, NRC Region I

Approved: _____ 2/28/96
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Inspection Summary:

This inspection report documents inspections to assure public health and safety during day and backshift hours of station activities, including: operations, radiological controls, maintenance and surveillance testing, emergency preparedness, security, engineering/technical support, and safety assessment/quality verification. The following Executive Summary delineates the inspection findings and conclusions.

EXECUTIVE SUMMARY

Hope Creek Inspection Report 50-354/95-20

December 22, 1995 - February 10, 1996

OPERATIONS

Operator recognition and response to unanticipated events was very good, and the frequency of operators errors declined. Command and control notably improved, despite the continued challenges of the extended outage and presence of equipment deficiencies resulting in control room distractions. Control room communication and log keeping was consistently good. A departmental self-assessment was sufficiently objective and identified findings consistent with oversight organizations. Routine tests and special evolutions were adequately controlled, however, several examples of less than effective work control and coordination resulted in challenges to station operators and plant equipment. An issue involving a failure to establish timely flood protection per technical specification requirements was classified a Non-Cited Violation.

Common weaknesses in the areas of procedure use, communications, and directing shift operations were observed in the performance of all three crews on the dynamic simulator portion of the recertification evaluations. None of the identified individual or crew weaknesses were significant enough to warrant immediate removal from licensed duties. The facility evaluators conducted thorough and detailed assessments of crew and individual competency that met the objectives of the recertification evaluations. Written performance standards were minimal and the facility evaluators often established or refined their performance expectations during discussions after the simulator scenarios. However, operations management recognized the need to better define performance expectations and improvement was noted in this area over the course of the observed evaluations.

Over the past several years, the operations department has not been rigorous about ensuring that all supervisory training requirements were met for newly assigned NSSs; however actions have been taken recently to improve the tracking of supervisory training and to ensure that all training requirements are met. Station management has recently placed more emphasis on developing and maintaining the supervisory skills of the operations department staff.

MAINTENANCE/SURVEILLANCE

Maintenance and surveillance activities adequately supported uneventful station operations throughout the period, and contributed to the resolution of several long standing hardware issues. Examples of good questioning attitudes were evident on the part of technicians, sometimes resulting in work stoppage and procedural refinements. Troubleshooting activities were well controlled, and increased use of vendor representatives was noted. Though not always effective, a new method of administrative control of maintenance in "protected" areas was considered a positive control initiative.

ENGINEERING

Significant changes in the structure and daily operation of the engineering organization contributed to increased departmental efficiency and improved support to the station as a whole. Improved prioritization and tracking of engineering work activities resulted in better focus on both long and short term issue resolution. Communication of engineering issues between Salem and Hope Creek stations improved. A "tiger team" assembled to promptly resolve emergency diesel generator concerns was effective at reducing associated maintenance backlog.

However, several safety related equipment deficiencies persisted for the duration of the inspection period despite the noted organizational and process improvements. These deficiencies included problems with station service water system reliability, performance of the radiation monitoring system, and emergency core cooling system pump discharge check valves.

PLANT SUPPORT

Radiation Protection department management demonstrated prompt and effective resolution of an issue involving an increase in personnel failing to ensure activation of electronic dosimetry prior to entry in to the radiologically controlled area. Additionally, radwaste and radiation protection personnel demonstrated good performance in the development and implementation of corrective actions stemming from a self-identified event involving the overflow of radioactive waste collecting tanks. The Hope Creek emergency response organization was adequately staffed within PSE&G specified time period during an unannounced call out drill. The subsequent critique by emergency preparedness personnel critically evaluated the drill and identified several areas for improvement.

Three plant support related issues, all documented in Licensee Event Reports, were classified as Non-Cited Violations based on licensee self-identification and resolution. These issues involved failure to obtain a timely offgas sample (chemistry), failure to obtain a filtration, recirculation, and ventilation system noble gas sample (radiation protection), and a failure to exert technical specification "best efforts" to resolve reliability concerns with the liquid radioactive waste radiation monitor.

The licensee maintained excellent radioactive liquid and gaseous effluent control programs, with capabilities to protect the public health and safety and the environment. The licensee also upgraded radioactive liquid and gaseous effluent control procedures that were easy to follow. The Chemistry and Radiation Protection staff demonstrated excellent knowledge in the effluent control programs. The responsible individual for radiation monitoring systems and air cleaning systems had very good knowledge. The responsible department staff responded to QA audit findings (3 for 1995) in a timely manner and with sound technical bases. However, these findings were not safety-significant.

Upper management's support to the System Engineer's effort, to maintain the good radiation monitoring system operability, was an excellent commitment to improve this area.

SAFETY ASSESSMENT/QUALITY VERIFICATION

Quality Assurance department personnel continued to identify good findings throughout the period. The QA department monthly report provided good feedback to station management, prioritizing assessment conclusions in order of significance. Root cause investigations for "level 1" condition reports were comprehensive and satisfied the objectives of the corrective actions program, however inconsistent performance was indicated for issues of lower significance. Management "hold point" reviews prior to progressing to a subsequent phase of the refueling outage were effective in ensuring uneventful transitions. A Safety Review Group assessment of the station's outage progress evaluated a large scope of activity but had little impact on improving station readiness for restart.

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DETAILS

1.0 SUMMARY OF OPERATIONS

The Hope Creek station was maintained in a cold shutdown condition for the duration of the inspection period as part of a scheduled refueling outage. At the end of the period the unit had been shutdown for 92 days. It was anticipated that restart of the unit for operating cycle seven would occur at the end of February, 1996.

The inspectors verified that Public Service Electric and Gas (PSE&G) operated the facilities safely and in conformance with regulatory requirements. The inspectors evaluated PSE&G's management control by direct observation of activities, tours of the facilities, interviews and discussions with personnel, independent verification of safety system status and technical specification compliance, and review of facility records. The inspectors performed normal and back-shift inspections, including 5 1/2 hours of deep back-shift inspections.

2.0 OPERATIONS

2.1 Shutdown Operations Performance Assessment

Recent resident inspection reports documented NRC concerns with the apparent increase in the "arrival rate" of significant issues that either directly or indirectly affected safe operation of the Hope Creek station, and challenged both plant operators and station management. During this report period, the inspectors noted a distinct decline in the frequency and significance of identified adverse conditions, despite a sustained high rate of documented discrepancies in accordance with the nuclear business unit's corrective action program. The frequency of operator errors, also cited previously as a significant NRC concern, showed evidence of decline. In addition, the inspectors noted that operator recognition and response to unanticipated operational occurrences was very good, and observed prompt and effective actions to mitigate the events.

Command and Control

The inspectors observed improved command and control of activities in the control room, stemming in part from a recent management-directed change that relocated the shift supervisor (licensed senior reactor operator (SRO)) into the control room area, vice outside the control room as had been prior practice. In addition, access to the control room area was limited to fewer individuals (at a time)in an effort to minimize unnecessary distractions to the licensed operators. The inspectors observed operators employing more frequent use of the Stop, Think, Act, Review ("STAR") principle prior to manipulating plant controls.

Despite these improvements and the above noted decline in operator error rate, the inspectors noted that several distractions still remained. For example, sluicing between safety auxiliaries cooling system (SACS) loops was required approximately every four hours due to abnormal system configurations, reactor manual control system lockups persisted despite recent attempts to resolve the

issue, and emergency diesel generator (EDG) fuel oil day tank levels frequently indicated below technical specification required minimums due to deficiencies with tank level indications. Additionally, some operator errors were committed. For example, two cases of inadvertent EDG output breaker trips while loading and unloading the unit(s) from the offsite electrical grid, and a double blade guide was mispositioned in the reactor vessel during core alterations.

Communications and Log Keeping

The inspectors witnessed improvements in inter- and intradepartmental communications throughout the period. Based on interviews with individuals at every level of the organization (including contract workers), it was evident that management expectations were generally understood and implemented. The structure of shift turnover meetings and the information provided in turnover briefing documents were revised to enhance continuity between shifts. Non-licensed equipment operators (NEO) continued to provide excellent input to shift supervision both in pre-evolution briefings and routine operations. For example, one NEO recommended roping off an area around the recirculation pump trip cabinets to minimize the potential for inadvertent loss of the recirculation pumps which were at the time being used for core circulation and decay heat removal. The inspectors also concluded that, based on daily reviews, control room operator logs were more detailed and descriptive, and that greater emphasis was placed on early recognition of potentially adverse trend conditions.

Response to Unanticipated Events

Operator response to unanticipated occurrences was very good, as evidenced by the following examples. On January, 5, 1996, while removing a control circuit fuse as part of a tagout on the "A" recirculation pump motor generator set, the "A" recirculation pump discharge valve unexpectedly opened and established a core shutdown cooling bypass flow path. Operators recognized this condition within 2 minutes and took immediate and effective action to report and reverse the condition. On January 21, 1996, an equipment operator identified a rapidly increasing jacket water temperature on the "A" EDG 12 minutes into a maintenance run and shutdown the machine at the local control panel before any damage to the unit resulted. On February 6, 1996, control room operators quickly identified an inadvertent reactor coolant discharge from the "B" recirculation pump seals that was initiated upon local opening of the associated pump discharge valve for VOTES testing. This event was terminated within 15 minutes.

Self Assessments

In accordance with the Hope Creek Outage Completion Plan, the operations personnel conducted a department self-assessment to assist in identifying areas requiring additional management attention prior to the unit restart. The inspectors observed the assessment in progress and reviewed the completed report. As a result, the inspectors concluded that the self-identified departmental weaknesses were reasonably consistent with independently derived assessments by the Quality Assurance department, the Safety Review Group, as

well as previously documented NRC findings. Specifically, increased attention was deemed necessary for system operability determinations, communication of management expectations, resolution of "workarounds," and coordination of station work activities.

2.2 Operations Work Control

As a result of assessments documented in previous inspection reports regarding weaknesses in the coordination of safety related work activities, the inspectors focused attention this period on the operations department interface in the control of scheduled and emergent work. Based on this review, the inspectors concluded that routine tests and special evolutions were adequately controlled and that plant operators were generally cognizant of all significant work in progress in the field. However, several examples of less than fully effective work control were identified resulting in operator and equipment challenges.

The inspectors reasoned that, given the nature of the refueling outage (i.e. the total work scope frequently changed and the work schedule was unusually erratic), the work control process was generally effective at ensuring safe and uneventful shutdown operation. When questioned, control room operators were generally aware of all significant plant work in progress. Safety tagging issues during the period were few and of only minor significance.

In cases involving special test or maintenance evolutions requiring coordination of multiple station departments, the inspectors witnessed excellent pre-evolution briefings and use of procedures. Examples included the preparation and execution of a transfer from normal residual heat removal system shutdown cooling operation to an alternate decay heat removal method using a recirculation pump and the fuel pool cooling system, and the extended emergency core cooling system pump operation test to demonstrate the performance of suppression pool pump suction strainers.

However, several unanticipated events did occur as a direct result of less than adequate work control administration. For example, on January 5, 1996, shutdown cooling flow to the reactor vessel was partially bypassed through a recirculation loop when the associated pump discharge valve unexpectedly opened during a control circuit fuse removal to support a tagout, in part because of weak interdepartmental job coordination and a failure to perform a truly independent review of a tagging request prior to approval. Another example included the unexpected engineered safety feature actuations that occurred during a Loss of Power coincident with a Loss of Coolant Accident (LOP/LOCA) surveillance test on December 26, 1995. In this instance, two safety related loads automatically started primarily because the operating crew failed to effectively evaluate the continued performance of the test procedure after the noted equipment had been manually removed from service because of earlier equipment malfunctions. A final example involved a January 21, 1996 event in which an EDG was manually shut down using a local panel emergency stop switch because of rapidly increasing jacket water temperatures. Post-event evaluation determined that the SACS inlet valve to the EDG jacket water heat exchanger was danger tagged shut, indicating a less than adequate review of EDG operational readiness prior to test conduct.

The inspectors concluded that these recent examples of weak work control performance, when coupled with previously documented events like the December 18, 1995 inadvertent EDG start (NRC Inspection Report 50-354/95-19) and the October 11, 1995 22,000 gallon water spill (NRC Inspection Report 50-354/95-17), indicated that earlier actions taken to improve work control administration have not been fully effective.

3.0 MAINTENANCE/SURVEILLANCE TESTING

3.1 Maintenance/Surveillance Observations

Throughout the report period, the inspectors witnessed numerous maintenance and surveillance activities on safety-related and important-to-safety equipment. In general, the inspectors observed liberal use of vendor representatives to assist in difficult or complex corrective maintenance activities, good adherence to governing work orders and procedures, and clear evidence of questioning attitudes during the conduct of work activities. Additionally, conservative use of a "parallel path" corrective maintenance philosophy was noted during troubleshooting efforts. With few exceptions, daily outage status and planning meetings (as well as other interdepartmental discussions regarding the coordination of outage maintenance activities) were generally effective at ensuring that Hope Creek safety objectives and management expectations were met.

The inspectors noted generally good implementation of maintenance program requirements during observation of both preventative and corrective maintenance activities. The inspectors did not identify any instances of procedural noncompliance or work order inadequacy. Technicians engaged in specific work activities were knowledgeable of the equipment being maintained and familiar with all task requirements. Of particular note was an apparent increase in technicians having a "questioning attitude" during work; several examples were noted, including an instance in which an inspector interview with an electrical maintenance supervisor was interrupted to address a contract maintenance worker's question regarding the adequacy of a routine electrical panel clean and inspect procedure. The worker was concerned that "megger" testing on buswork he was working on would result in damage to permanently connected loads.

Troubleshooting activities were generally well controlled and employed "parallel path" work processes. For example, the inspectors witnessed efforts to resolve a high differential exhaust temperature condition on an EDG cylinder following a surveillance run. Detailed work orders were generated (and implemented) to replace the associated fuel injector and evaluate the condition of the cylinder temperature instrumentation. A similar process was used to resolve concerns with other failed equipment, including the filtration, recirculation, and ventilation system radiation monitors and air actuated flex wedge gate valves that control flow to safety related room coolers. The inspectors observed routine use of vendor representative consultations during routine and complex outage work on specific systems, most frequently with the EDG's. Additionally, VOTES test equipment vendors and valve manufacturer representatives were frequently on site assisting in critical work.

A recent initiative to post and control rooms containing vital or protected equipment was deemed a positive administrative control measure to minimize the potential for adverse plant transients. During routine inspector tours of these controlled areas, the inspectors only noted one instance of ongoing maintenance being conducted. In this case, which involved work in the protected "B" 4160 VAC switchgear room, the technicians were not fully aware of PSE&G management's expectations regarding access control to the area and ensuring that the operating crew was informed of their presence.

3.2 Scaffolding

Due to the large scope of work conducted during the outage requiring scaffolding to support maintenance activities, the inspectors reviewed a sampling of scaffolds erected in safety related equipment areas to evaluate their conformance to PSE&G requirements and their potential to impact adjacent system operability. Based on this limited review, the inspectors concluded that scaffolds in safety related areas were constructed appropriately to preclude adverse impact on adjacent system function under both normal and seismic event conditions.

Despite the noted adherence to construction standards, the inspectors noted several examples of scaffolds which had not been subsequently inspected at PSE&G mandated intervals. For example, the inspectors identified two scaffolds (one in the "A" SACS room and one "permanent" structure that enables access to an RHR-to-Fuel Pool Cooling cross-connect valve) that had not been revisited in over one month, beyond the mandated 30 day requirement. Hope Creek follow up inspection of these scaffolds determined that no degradation had occurred. The inspectors noted that subsequent PSE&G management action to perform a more broad-based scaffold compliance review identified additional missed periodic inspections; however, prompt action was taken to reinspect the structures and reemphasize the program requirements to all applicable personnel.

4.0 ENGINEERING

4.1 Inspection Findings

Overall, the inspectors observed significant changes in the operation of the entire nuclear business unit engineering department, most significantly in organizational structure and daily routine. The engineering department evolved into a more "service oriented" organization that better supported the needs of the Hope Creek station. For example, in February 1996, Hope Creek system engineering redefined the roles of its engineers by creating both system managers and maintenance engineers, in order that appropriate focus could be maintained in overall system tracking and trending as well as daily system walkdowns and maintenance oversight. The inspectors noted improvements in justification and prioritization of engineering work activities, with clearer focus on both long term and short term issue resolution. Daily engineering meetings (with excellent participation by supervision from all of branches the department) combined with new activity tracking sheets helped to enhance accountability of action items, and better highlighted the status of critical path concerns.

However, despite the clear evidence of improvements in the communication, coordination, and resolution of engineering issues, the inspectors noted that several safety related work activities demanded significant expenditures of time and resources with as yet unsuccessful results. In addition, some issues previously believed to have been corrected remained active problems. Specifically, the Filtration, Recirculation, and Ventilation System exhaust radiation monitor remained inoperable for the duration of the report period, and much of the last period as well. Unreliable operation of the station service water system (SSW) was evidenced by functional failures of pump discharge strainer baskets, inadequate backwash flows, and insufficient intake structure travelling screens spraywash flows. A failed discharge strainer on the "C" SSW pump resulted in heavy fouling of downstream heat exchanger tube sheets, impacting maintenance department workload and the system outage duration.

Additionally, a previously documented 10 CFR 21 concern regarding safety related pump discharge check valve sticking (see NRC Inspection Reports 50-354/94-26 and 95-01) was thought to be resolved by the implementation of an upgraded hinge arm design developed by the valve manufacturer. However, when applied, the modified check valves continued to exhibit the same adverse operating characteristics as the unmodified version, including another functional failure (stuck open disk). The inspectors learned that PSE&G was considering an update to the previous 10 CFR 21 report.

4.2 Emergency Diesel Generators

In keeping with the above stated assessment regarding improved engineering focus in prioritizing and resolving issues, the inspectors noted that with few exceptions, engineering personnel demonstrated prompt and effective action to address the numerous EDG related concerns identified during the period. A "tiger team" comprised of engineering and maintenance personnel was assembled to identify and quickly resolve all significant discrepancies on the machines. The results of this initiative appeared effective, though the inspectors noted that several minor problems were not addressed by the team. For example, following the "A" EDG outage work, seven deficiency tags were still applied to various annunciators on the local control panel.

The inspectors observed good, conservative decision making and follow up to a January, 24, 1996 event in which Hope Creek operators discovered that a large section of insulation had fallen off the exhaust header of the "A" EDG. Engineering personnel quickly determined that the section of insulation was not installed in accordance with design specifications and that this degraded condition existed on all four units. In addition, engineering raised a concern regarding temperature sensors located in close proximity to the exhaust headers that activate the carbon dioxide fire suppression system (and terminate ventilation and cooling the EDG room(s)). Based on this noted concern, operators declared all four EDG's inoperable pending a detailed engineering analysis, and reported the event per 10 CFR 50.73. Scaffolding was erected to support the insulation on the other three machines, with due consideration to seismic qualification criteria. The inspectors reviewed the

detailed quantitative analysis completed two weeks after the event and concluded that it provided adequate justification for retracting the non-emergency report to the NRC.

4.3 Station Service Water System Temporary Modification

The inspectors reviewed the design and operation of a station service water (SSW) system modification that employed the use of a temporary piping connection from an emergency overboard "dump" to the yard sewer system. Based on this review and direct observation of system operation, the inspectors concluded that the temporary modification's development, implementation, and operation were in accordance with station and regulatory requirements. However, the inspectors noted that temporary modification safety evaluation documentation was not initially available in the work control center as required.

Under normal shutdown system operation, SSW flow leaves the station and is directed to the cooling tower basin. In order to support work in the basin and on a basin bypass valve, engineering personnel developed a modification that directed flow from the emergency overboard connection to the yard drainage system using a large diameter non-seismically qualified pipe. The inspectors noted that the design of the pipe incorporated a large open vented standpipe to protect against the potential for piping blockage or crimping during design basis events. The safety evaluation adequately addressed the questions in 10 CFR 50.59 and the station operations review committee review was thorough. Procedures for operation of the modified system were appropriately developed, reviewed, and implemented.

4.4 Operating Experience Feedback of Engineering Issues

The inspectors witnessed increased evidence of a renewed operations and engineering experience program at Hope Creek, noting good review and use of feedback from Salem, the industry, and the NRC. The inspectors observed generally prompt response in addressing potentially generic issues raised by these means. The frequency of operating experience review meetings increased and corrective action review board newsletters were published to improve the communication of industry operating experience.

For example, Hope Creek response to NRC Bulletin 95-02 (Unexpected Clogging of an RHR Pump Suction Strainer...) effectively addressed the noted concerns in the Bulletin prior to station restart. The inspectors witnessed portions of the suction strainer visual inspections and extended emergency core cooling pump runs to quantify strainer performance, and concluded that engineering personnel adequately resolved the concerns. Additionally, effective engineering follow up to an industry issue involving motor operated valve actuator shaft cracking promptly identified similar concerns at Hope Creek. As a result, several safety related valve actuators were replaced during the shutdown period. Finally, a generic failure concern regarding a General Electric supplied switch (SBM type) used in safety related applications was surfaced at Salem station, and promptly communicated and addressed at Hope Creek.

5.0 PLANT SUPPORT

5.1 Radiological Controls and Chemistry

The inspectors periodically verified PSE&G's conformance with their radiological protection program. During plant tours and direct observation of operations and maintenance activities, the inspector observed that the radiological protection program was being properly implemented. Resolution of an issue involving an increase in the number of personnel failing to ensure electronic dosimetry activation prior to radiologically controlled area entry was prompt and effective. In a follow up improvement effort to address previously documented concerns with high radiation area access controls (see NRC Inspection Report 50-354/95-10), the inspectors observed the installation of improved swing gates at access points and the implementation of revised radiation work permits that emphasized entry and exit requirements.

5.2 Radioactive Waste Neutralizer Tank Overflow

The inspectors witnessed PSE&G's response to a self-identified issue in which standing radioactive liquid waste was discovered in the diked areas around two radioactive waste neutralizing tanks inside the Hope Creek station. The inspectors concluded that, overall, radioactive waste and radiation protection personnel took prompt and effective action to ensure that no other tank rooms experienced similar conditions and that plans were devised and implemented to dewater and decontaminate the affected rooms. Additionally, the root cause assessment was thorough and resulted in the development of good corrective actions.

Specifically, on December 28, 1995, radiation protection personnel discovered several inches of standing water in both waste neutralizer tank rooms (normally inaccessible as locked radiation areas) while escorting fire protection personnel in the affected areas. Technicians were quickly dispatched to evaluate the condition of all other radioactive waste collection areas; no other problems were identified. Radwaste department management conducted a thorough review of tank level records to determine if an overflow condition had occurred in the recent past and determined that, since the room was last inspected in June 1995, tank levels had never exceeded 95% capacity. However, during the subsequent root cause evaluation, PSE&G determined that though tank level instrument calibrations were current, they were scaled to an improper reference point. As a result, with tank levels indicating 95%, an overflow through the tank vents would occur.

Based on a radiographic analysis of the overflowed water and the noted log reviews, PSE&G determined that the overflow event likely occurred in late July or early August 1995. The affected rooms were dewatered and decontaminated and all system piping and components were inspected to verify satisfactory structural integrity. Tank level indicators were properly scaled and recalibrated; radiation protection personnel modified their routine survey program to incorporate a visual check of the affected areas on a quarterly basis. The inspectors determined that overall response to the event was good, and that no adverse radiological impact to the station or environment was evident.

5.3 Emergency Preparedness

The inspectors reviewed PSE&G's conformance with 10 CFR 50.47 regarding implementation of the emergency plan and procedures. In addition, the inspectors reviewed all Hope Creek event notifications during the period and concluded that the requirements of 10 CFR 50.72 and 73 were satisfied. Two one hour notifications were made in accordance with PSE&G's Emergency Classification Guides to report significant degradation of the offsite siren network. During this inspection period there were no required emergency notifications.

Emergency Preparedness Call-out drill

The inspectors observed an unannounced, off-hours, Hope Creek emergency response organization (ERO) call-out and staffing drill for the Technical Support Center (TSC), Operational Support Center (OSC), Emergency Operations Facility (EOF) and the Emergency News Center (ENC) beginning at 4:00 a.m. on February 9, 1996. The licensee's goal for activation of the facilities with the required minimal responders was 60 minutes from the time of notification.

An Alert was declared at 4:15 a.m. and the call-out system was activated at 4:28 a.m. The inspectors observed that the emergency facilities were staffed, with the minimum required personnel, at the following times:

- TSC 5:35 a.m.
- OSC 5:02 a.m.
- EOF 5:24 a.m.
- ENC 5:28 a.m.

Poor weather conditions that morning made driving conditions hazardous, adding ten to fifteen minutes to the normal driving time of the ERO responders. Despite these conditions, the Emergency Director assumed command of the situation from the Senior Nuclear Shift Supervisor in the plant control room, and declared the TSC activated at 5:44 a.m., one hour and sixteen minutes after activation of the call-out system. It should be noted that the EOF was staffed in a shorter period than the TSC because it is generally a shorter driving distance for the responders than is the TSC, which is in the plant.

During interviews with several of the ERO responders, the inspectors verified that response personnel had no prior knowledge that the drill would be conducted.

A Site Area Emergency was declared at 6:00 a.m. and the drill was terminated at 6:45 a.m.

The inspectors attended the licensee's critique of the drill at 10:00 a.m. that same day. The licensee declared that the objectives for ERO staffing and activation of the facilities were met, and identified several areas for improvement, which the licensee took for consideration. The inspectors assessed the critique as appropriately self-critical.

Overall, licensee's performance for the unannounced, off-hours, call-out drill was deemed to be acceptable by the inspectors.

5.4 Security

The inspectors verified PSE&G's conformance with the security program, including the adequacy of staffing, entry control, alarm stations, and physical boundaries. The inspectors observed good performance by security department personnel in their conduct of routine activities. During tours of the protected and vital areas, the inspectors observed that the security related hardware was maintained in good working order. The inspectors observed the implementation of actions taken relative to preventing unauthorized vehicle entry to the site. These activities appeared to be well controlled.

5.5 Housekeeping

The inspectors reviewed housekeeping conditions and cleanliness controls at Hope Creek in accordance with nuclear department administrative procedures. During routine plant tours and following system restoration from maintenance activities, the inspector observed generally good implementation of the station cleanliness program.

5.6 Fire Protection

The inspectors conducted periodic observations of the implementation of the fire protection program at the Hope Creek station. Observations included fire watches, ignition source control, fire brigade manning, fire detection and suppression systems, and fire barriers and doors. The inspectors noted that only minor deficiencies were identified during the inspection period and that all potentially adverse conditions were promptly resolved.

6.0 SAFETY ASSESSMENT AND QUALITY VERIFICATION

Quality Assurance (QA) and Nuclear Safety Review Group (NSR) activities were reviewed to ensure that findings were consistent with NRC assessments; no inconsistent findings were noted. The inspectors witnessed frequent involvement of QA/NSR individuals in the oversight of the line organization, including observations of field activities and participation in status and decision making meetings. QA personnel continued to document good findings of operational significance, enhancing their credibility and visibility. The inspectors reviewed the QA/NSR monthly report to the station and judged that it was an effective means of summarizing overall assessments. Further, it provided adequate basis for stated conclusions, as well as prioritized the stated concerns in order of significance. The December 1995 version of the report (issued January 9, 1996) listed corrective action program deficiencies, procedural adherence concerns, and operability determinations as the current key issues for management focus.

The inspectors attended an exit meeting led by the safety review group in which a team review and assessment of Hope Creek startup progress was discussed. While the team review evaluated a large scope of line organization

activity, the inspectors concluded that the stated findings only confirmed information previously documented in individual department self assessments and those of the NRC and Hope Creek line management. As a result, overall impact of the team assessment was deemed minimal.

Several level 1 condition reports were generated during the report period which required detailed root cause analyses in accordance with the station's corrective action program. The inspectors reviewed a sampling of these level 1 evaluations (including team findings of the January 5, 1996 partial bypass of shutdown cooling and the February 6, 1996 inadvertent reactor coolant discharge) and concluded that they were thorough, detailed and sufficiently focused to establish true root cause(s). Further, recommended actions documented in the assessments to correct the stated causes were judged as appropriate. The inspectors further observed that Hope Creek management firmly supported the findings and implemented prompt actions to resolve the concerns. In contrast, a QA/NSR finding during the period concluded that the quality of level 2 and 3 evaluations were highly inconsistent, often lacking thorough justifications for stated conclusions or not performed within required time periods.

The Hope Creek Outage Completion Plan, implemented on November 26, 1995, in part required management "hold points" at specific stages of the refueling outage. The intent of the hold points was to assure that all criteria for successful transition to the next stage of the outage were satisfactorily met. The inspectors observed Hope Creek management's review process at the hold point just prior to swapping protected instrument and control system channels, and concluded that it was an excellent means of assuring it's stated objective. Station management employed a rigorous process to evaluate all open work orders, surveillance tests, technical specification limiting conditions for operation, and corrective and preventative maintenance backlog.

7.0 LICENSEE EVENT REPORTS (LER), PERIODIC AND SPECIAL REPORTS

7.1 LERs and Reports

The inspectors reviewed Licensee Event Reports (LER's) to determine whether the licensee took the corrective actions stated in the report, detect if the licensee responded to the events adequately, and ascertain if regulatory requirements and commitments were appropriately addressed. The inspectors concluded that, overall, the LER's adequately documented the adverse conditions and events. Corrective actions appeared appropriate given the stated root causes. Additionally, corrective actions were completed by the stated commitment dates; exemption requests were submitted for commitments in danger of not being met.

The inspectors determined that the following licensee event reports do not warrant further inspection or enforcement action:

Number	Event Date	Description
LER 95-022	7/20/95	Failure to enter Technical Specification 4.0.3 when conditions dictated that all emergency diesel generators should have been declared inoperable. (Discussed in NRC Inspection Report 95-17 Attachment 1)
LER 95-023	9/30/95	Unplanned entry into Technical Specification 3.0.3 due to not demonstrating operability of emergency diesel generators in accordance with Technical Specification 3.8.1.1 action b. (Discussed in NRC Inspection Report 95-17 Attachment 1)
LER 95-024	9/28/95	Missed special report -- inoperable FRVS high range noble gas radiation monitor. (Discussed in NRC Inspection Report 95-17 section 2.2 as Non-Cited Violation)
LER 95-025	10/24/95	High Pressure Coolant Injection system declared inoperable due to an out of adjustment limit switch. (Discussed in NRC Inspection Report 95-17 section 3.2)
LER 95-026	10/26/95	Shutdown LCO action statement entered due to inoperable accumulator trouble annunciator. (Discussed in NRC Inspection Report 95-17 section 2.1.2).
LER 95-029	11/02/95	Both trains of Standby Liquid Control declared inoperable due to the failure to perform surveillances in accordance with Inservice Testing requirements. (Discussed in NRC Inspection Report 95-17 section 3.2 as Non-Cited Violation)
LER 95-031	11/10/95	Technical Specification required shutdown due to the inability to perform surveillance 4.6.2.1, drywell to suppression chamber pressure decay test. (Discussed in NRC Inspection Report 95-19 section 1.0)
LER 95-033	11/14/95	Inadequate testing of undervoltage logic circuitry resulting in a missed surveillance, followed by an ESF actuation during surveillance testing. (Additional example of violation discussed in LER 95-017 and NRC Inspection Report 95-11 section 3.2)

LER 95-034	11/10/95	Technical Specification violation -- failure to follow Rod Sequence Control System surveillance procedures. (Discussed in NRC Inspection Report Section 2.4 as a Notice of Violation.)
LER 95-035	11/20/95	Failure to lock the Reactor Mode Switch in OPCON 5, missed SRM surveillance, missed suppression chamber level surveillance. (Discussed in NRC Inspection Report section 2.4 as a Notice of Violation).
LER 95-036	11/19/95	As found values for safety relief valve lift setpoints exceeded Technical Specification allowable. (Additional examples of conditions reported in LER 94-004 and discussed in NRC Inspection Report 95-10 as a Non-Cited Violation.)
LER 95-037	12/04/95	Both loops of Safety Auxiliaries Cooling System inoperable. (Discussed in NRC Inspection Report 95-19 Attachment I as an apparent violation of NRC requirements.)
LER 95-038	11/27/95	Failure to comply with required Technical Specification action statement upon removal of failed snubber on the RHR Shutdown Cooling line. (Discussed in NRC Inspection Report 95-19 Attachment I as an apparent violation of NRC requirements.)
LER 95-040	12/18/95	Engineered Safety Feature actuation -- Emergency Diesel Generator start due to improper removal from service. (Discussed in NRC Inspection Report 95-19 section 3.2)

The following licensee event reports were reviewed in detail and assessed as follows:

LER 95-027: On October 27, 1995, Hope Creek chemistry technicians failed to obtain an offgas "grab" sample within the technical specification 3.3.7.1 established time frame. Periodic grab sampling was required because of an earlier malfunction of the installed offgas pretreatment radiation monitor. The inspectors reviewed and described this event in detail in NRC Inspection Report 95-17 section 5.1, and concluded that licensee response to this event was prompt and effective, and that corrective actions were likely to resolve the issue long term. Safety significance was deemed to be low. This failure, resulting primarily from an unexpected valve failure, constitutes a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy.

LER 95-028: On October 30, 1995, based on the findings of a Quality Assurance audit of radioactive effluents program implementation, Hope Creek management acknowledged that the Liquid Radwaste Effluent Radiation Monitoring System had been inoperable for approximately 40% of 1995. The inspectors recognized the unreliability of the system in September 1995 and documented an assessment of the concern in NRC Inspection Report 95-16 section 5.1. As a result, management subsequently concluded that "best efforts" required by technical specification 3.3.7.10 had not been made to correct the chronic equipment problems. The licensee's root cause investigation determined that the low management priority placed on the resolution of the issue was responsible for the inadequate implementation of the technical specification requirement. Subsequently, the work control process at Hope Creek was revised to emphasize high priority for work activities intended to resolve technical specification related equipment discrepancies. This issue involves a violation of minor significance and is being treated as a non-cited violation consistent with Section IV of the NRC Enforcement Policy.

LER 95-30: On November 6, 1995, a Hope Creek radiation protection technician determined that noble gas grab samples from the Filtration, Recirculation, and Ventilation System (FRVS) effluent release path which had been placed in service the prior day had not been taken as required by technical specification 3.3.7.11. Grab sampling during FRVS operation was required to because of an earlier failure of the installed system radiation monitor. Licensee investigation determined that personnel error was at the root of the event in that the responsible technician failed to review the governing procedure to determine required actions. Inadequate shift turnover contributed to the failure to obtain the appropriate effluent samples. The inspectors assessed the licensee's response to this event and concluded that corrective actions were appropriate. In addition, safety consequence was deemed to be low. This failure constitutes a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy.

LER 95-32: On November 14, 1995, the Delaware River level at the service water intake structure exceeded 95 feet, requiring station operators to set flood protection within one hour in accordance with plant procedures and Hope Creek technical specification action statement 3.7.3.a.1. However, during the course of implementing this requirement, one watertight door could not be closed in the noted time frame due to a seal mechanism failure. This door had been in a "degraded but operable" status since December 1994 because of obsolete spare parts. The inspectors concurred with the licensee's assessment that inadequate management priority was placed on the resolution of this technical specification related equipment issue. However, the consequence of this event was low in that the door was protecting an empty service water bay originally designed for Hope Creek Unit #2. This failure constitutes a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy.

All of the above listed licensee event reports are considered closed.

8.0 REVIEW OF UFSAR COMMITMENTS

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR descriptions. During a portion of the inspection period (February 1-10, 1996) the inspectors reviewed the applicable sections of the UFSAR that related to the inspection areas discussed in this report. Specifically, normal and emergency shutdown operation of the station service water system was reviewed. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures and/or parameters.

9.0 EXIT INTERVIEWS/MEETINGS

9.1 Resident Exit Meeting

The inspectors met with Mr. M. Reddemann and other PSE&G personnel periodically and at the end of the inspection report period to summarize the scope and findings of the inspection activities.

9.2 Management Meetings

An NRC management meeting was held with senior Hope Creek personnel on January 18, 1996, in the NRC Region I office. The purpose of the meeting was to discuss the Hope Creek refueling outage and restart program. PSE&G meeting presentation materials were acknowledged in separate NRC correspondence.

9.3 Licensee Management Changes

During the report period, PSE&G announced the following Hope Creek managerial changes:

- On January 15, 1996, Mr. C. Clapper was named to the Hope Creek system engineering manager position.
- On the same day, Mr. G. Madsen, formerly the acting Hope Creek system engineering manager, was named as Mr. Clapper's assistant.

ATTACHMENT 1

RADIOACTIVE LIQUID AND GASEOUS
EFFLUENT CONTROL PROGRAMS INSPECTION

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NO.: 50-354/95-20

LICENSEE: Public Service Electric Company
P.O. Box 236
Hancocks Bridge, New Jersey 08038

FACILITY: Hope Creek Generating Station

DATES: January 29-February 2, 1996

Original Siged By: 2/16/96

INSPECTOR:

Jason C. Jang, Sr. Radiation Specialist Date
Radiation Safety Branch
Division of Reactor Safety

Original Signed By: 2/16/96

APPROVED BY:

John R. White, Chief Date
Radiation Safety Branch
Division of Reactor Safety

AREAS INSPECTED: Announced safety inspection of the radioactive liquid and gaseous effluent control programs including: management controls, audits, calibration of effluent/process radiation monitoring systems, air cleaning system control and operation; and maintenance, use, and application of the Offsite Dose Calculation Manual (ODCM).

REPORT DETAILS FOR HOPE CREEK FEEDER REPORT NO. 95-20

1.0 PURPOSE

The purpose of this inspection was to review the licensee's ability to control and quantify effluent radioactive liquids, gases, and particulates during normal and emergency operations.

2.0 MANAGEMENT CONTROLS

2.1 Program Changes

The inspector reviewed the organization and administration of the radioactive liquid and gaseous effluent control programs and discussed with the licensee changes made since the last inspection, conducted in June 1994. The inspector determined that there were no changes to the radioactive effluent control programs.

The Chemistry Department has primary responsibility for conducting the radioactive liquid and gaseous effluent control programs. Other responsible groups for the programs are: (1) Operations, (2) Radiation Protection, (3) Instrumentation and Controls (I&C), (4) System Engineer, (5) Radwaste Operations, and (6) Service Department.

2.2 Quality Assurance (QA) Audits

The inspector reviewed the 1994 QA audit report (Report No. 94-151) and the 1995 QA audit report (Report No. 95-151). These audits were conducted by the Nuclear Quality Assurance Department (NQA) staff and covered the radioactive liquid and gaseous effluent control programs. The inspector noted that the audits were conducted by members of NQA with assistance from other technical personnel, including a contractor.

The 1994 audit team identified no significant findings and only one observation. The 1995 audit team identified three findings relative to the System Engineering Department and several minor observations relative to the Chemistry and Radiation Protection Departments. The inspector determined that these findings and observations were not safety-significant, but were intended for the enhancement of the effluent control programs. The internal responses to the 1995 findings were very complete and directed toward improving overall performance. The inspector noted that the scope and technical depth of the audits were appropriate and sufficient for assessing the radioactive liquid and gaseous effluent control programs. The inspector had no further questions in this area.

2.3 Review of Semiannual/Annual Radioactive Effluent Reports

The inspector reviewed the 1993 semiannual radioactive effluent release reports and the 1994 annual radioactive effluent release report. These reports provided data indicating total released radioactivity for liquid and gaseous effluents. These reports also summarized the assessment of the projected maximum individual and population doses resulting from routine

radioactive airborne and liquid effluents. Projected doses were well below the Technical Specification (TS) limits. The inspector determined that there were no obvious anomalous measurements, omissions, or trends reflected in the report.

The licensee summarized historical radioactive liquid and gaseous release data and projected dose calculation since the start of commercial operations for trending purposes, and reported these trend data in semiannual/annual reports. The inspector determined that including these trending data enhanced the perspective of the report and appeared to be a good initiative.

3.0 REVIEW OF OFFSITE DOSE CALCULATION MANUAL (ODCM)

The inspector reviewed the licensee's ODCM, Revision 15, effective on January 5, 1995. The ODCM described the sampling and analysis programs, which formed the bases for the quantification of radioactive liquid and gaseous effluent concentrations and the subsequent calculation of projected doses to the public. All necessary parameters, such as effluent radiation monitor setpoint calculation methodologies, site specific dilution factors, and dose factors, were sufficiently described in the ODCM or otherwise derived from Regulatory Guide 1.109, as necessary.

Based on the above review, the inspector determined that the licensee's ODCM contained all necessary information and instruction to successfully execute the requirements of the radioactive liquid and gaseous effluent control programs, and the Radiological Environmental Monitoring Program.

4.0 RADIOACTIVE LIQUID AND GASEOUS EFFLUENT CONTROL PROGRAMS

4.1 Implementation of the Programs

The inspector: (1) toured the plant, (2) reviewed the following selected licensee's procedures, and (3) reviewed radioactive liquid and gaseous discharge permits to determine the implementation of the TS and the ODCM requirements.

- HC.CH.TI.ZZ-0015(Q), Radioactive Liquid Effluent Permits
- HC.CH.TI.ZZ-0005(Q), Radioactive Gaseous Effluent Permits

During the tour, the inspector noted that all effluent radiation monitoring system (RMS) were operable at the time of this inspection, with the exception of the Filtration, Recirculation, and Ventilation System (FRVS) RMS. The licensee was calibrating FRVS RMS at the time of this inspection.

The inspector examined the licensee's alternate offgas sampling apparatus. Previously, the licensee experienced numerous problems with the offgas sampling panel in support of compensatory sampling. As a result, a compensatory sample was not taken as required, as previously reported in LER 95-27. As a corrective action for this occurrence, the licensee's

Chemistry Department constructed a new apparatus to prevent recurrence. The inspector noted that the alternate offgas sampling apparatus was well designed and constructed, and could be used to provide compensatory sampling to support other noble gas sampling stations (North and South Plant Vents).

The inspector observed that the radioactive liquid and gaseous effluent procedures had been upgraded since last reviewed. These upgraded procedures, though more detailed, were better written and appeared easier to follow than the previous revision.

Based on selected review, the inspector determined that the radioactive effluent discharge permits were complete and met the TS/ODCM requirements for sampling and analyses relative to frequency and lower limit of detection capability.

During the discussion with the Chemistry and Radiation Protection Departments staff, the inspector noted that the responsible individuals had maintained and continually enhanced their knowledge in the areas of: (1) radioactive liquid and gaseous effluent controls, (2) effluent/process RMS, (3) protection of the public health and safety and the environment, and (4) effluent ALARA concepts and practices.

4.2 Review of Licensee Event Reports (LERs)

The inspector reviewed four LERs (LERs 95-24, 95-27, 95-28, and 95-30) related to the effluent control programs. These particular LERs reported on occasions of missed compensatory samples and inoperability of the radioactive liquid effluent radiation monitoring system (RMS). LER 95-28 was previously discussed in NRC Inspection Report 95-16, Section 5.1. The LER was generated for a condition in which the radioactive liquid effluent RMS was inoperable for a period in excess of the TS requirement. The inspector reviewed the licensee's root cause assessment, and confirmed that this event was partially caused by contamination of the monitoring chamber and associated piping due to carry-over of suspended solids from the liquid radioactive waste filtration system. The evidence indicated that suspended solids accumulated in the monitoring chamber and associated piping, and elevated the background such that the monitor had to be declared as inoperable. Subsequently, the licensee replaced the chamber and associated piping. The monitor was operable at the time of this inspection. The licensee is evaluating the liquid radioactive waste filtration system for further improvements. Due to the circumstances, and nature of the events, and thoroughness of the licensee's corrective actions, the events covered in these LERs were considered as non-cited violations.

The Radiation Protection Department staff recently performed a self-assessment for the purpose of improving the effluent control programs. The self-assessment results were also used as input to the corrective action agenda for the previously identified listed LERs. The inspector reviewed the self-assessment report and determined that the effort was well documented. The inspector noted that the effort also appeared to focus on the reduction and elimination of human performance weaknesses.

Notwithstanding the matters that were reported by the identified LERs, the inspector determined that the licensee continued to perform generally well relative to executing the requirements of the radioactive liquid and gaseous effluent control programs. The programs were performed in a safe and effective manner and were in conformance with applicable regulatory requirements.

5.0 CALIBRATION OF EFFLUENT/PROCESS RADIATION MONITORING SYSTEMS (RMS)

The inspector reviewed the most recent calibration results for the following effluent/process RMS to determine the implementation of the TS requirements and FSAR commitments:

- South Plant Vent Stack (low, mid, and high ranges) Monitors
- North Plant Vent Stack (low, mid, and high ranges) Monitors
- FRVS Noble Gas Monitor
- Offgas Radiation Monitor
- Liquid Radwaste Discharge Monitor
- Cooling Tower Blowdown Monitor
- Safety Auxiliary Cooling Radiation Monitor

The I&C Department had the responsibility to perform electronic and radiological calibrations for the above radiation monitors. All reviewed calibration results were within the licensee's acceptance criteria. The licensee performed gamma and beta energy response checks, as well as linearity checks (see Table 1). The calibration efforts were well done and exceeded the quality specifications detailed by the applicable regulatory requirements.

The inspector discussed the maintenance of operability with the assigned Radiation Monitoring System-System Engineer. From this interview and discussions with other managers, it appeared that system operability was a high priority and that the system engineer was well supported by plant and executive managers.

During the review of the above RMS calibration results, the inspector noted that the System Engineer performed a statistical evaluation to trend system reliability. The inspector independently evaluated for several effluent/process RMS using the licensee's historical data (1989-1995). The evaluated result was illustrated in Table 1.

Table 1. Reproducibility of the Effluent/Process RMS

Radiation Monitoring Systems	Energy Response	Energy Response	Energy Response	Efficiency (1) (CPM/uCi)
Liquid Effluent	Cd-109 CV=5.0 % (2)	Ba-133 CV=3.6 %	Co-60 CV=3.0 %	Cs-137 CV=5.0 %
SPV Noble Gas Monitor (3)	Tc-99 CV=8.1 %	Cl-36 CV=1.8 %	Sr-90 CV=2.4 %	Sr-90 CV=7.1 %
NPV Noble Gas Monitor (4)	Tc-99 CV=2.1 %	Cl-36 CV=3.6 %	Sr-90 CV=5.3 %	Sr-90 CV=4.7 %
FRVS Noble Gas Monitor (5)	Tc-99 CV=2.7 %	Cl-36 CV=4.6 %	Sr-90 CV=2.4 %	Sr-90 CV=11.0%

(1) Efficiency = Conversion Factor = Secondary Calibration Factor
(2) CV = Coefficient of Variation [(standard deviation/mean)x100]
(3) SPV = South Plant Vent
(4) NPV = North Plant Vent
(5) FRVS= Filtration Recirculation and Ventilation System

The purpose of evaluation was to assess system trending for the reproducibility as opposed to acceptability. The inspector used statistical analysis [coefficient of variation (a relative standard deviation)] to determine the degree of reproducibility. These results are reported as "CV." CV of FRVS was 11%, the highest value among the RMS, and an indication of the least reproducible RMS depicted in Table 1. The inspector noted that several factors (e.g., geometry, temperature, humidity, and power variation) contribute to the CV, as described in ANSI N42.18-1980, "Specification and Performance of On-site Instrumentation for Continuously Monitoring Radioactivity in Effluents." The inspector noted that the System Engineer independently arrived at the same conclusion. In fact, the System Engineer already initiated an investigation for the FRVS calibration technique, including questioning of the environmental factors and calibration geometry. The Systems Engineers' efforts demonstrated high proficiency and understanding of the complexities associated with the maintenance and operation of this equipment.

Based on the above reviews, the inspector determined that the licensee's performance and achievements, relative to calibration of the RMS, was excellent.

6.0 AIR CLEANING SYSTEMS

The inspector reviewed the licensee's most recent surveillance test results to determine the implementation of TS requirements and FSAR commitments for the following air cleaning systems:

- TS 3/4.6.5.3, Filtration, Recirculation, Ventilation System

- TS 3/4.7.2, Control Room Emergency Filtration System
- FSAR Commitment: Offgas Exhaust System
- FSAR Commitment: Reactor Building Exhaust System

The inspector reviewed the following surveillance test results:

- Visual Inspection
- In-Place HEPA Leak Tests
- In-Place Charcoal Leak Tests
- Air Capacity Tests
- Pressure Drop Tests
- Laboratory Tests for the Iodine Collection Efficiencies

All reviewed test results were within the licensee's TS acceptance criteria. During the review of the above test results, the inspector noted that the responsible individual had very good knowledge, not only about the TS requirements, but also about implementing TS correctly based on the sound technical bases. The inspector had no further questions in this area.

ATTACHMENT 2

RECERTIFICATION EVALUATION INSPECTION

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET NO./REPORT NO.: 50-354/95-20

LICENSEE: Public Service Electric and Gas Company

FACILITY: Hope Creek Nuclear Generating Station

LOCATION: Hancocks Bridge, New Jersey

DATES: January 4 - February 2, 1996

INSPECTOR: Original Signed By: 2/14/96

Tracy E. Walker, Sr. Operations Engineer date
Operator Licensing and Human Performance
Branch
Division of Reactor Safety

APPROVED: Paul Bissett/for 2/14/96

Glenn W. Meyer, Chief date
Operator Licensing and Human Performance
Branch
Division of Reactor Safety

REPORT DETAILS FOR RECERTIFICATION EVALUATION INSPECTION NO. 50-354/95-20

1.0 BACKGROUND AND SCOPE

Public Service Electric and Gas (PSE&G) conducted recertification evaluations of the on-shift operating crews at the Hope Creek Generating Station as part of the licensed operator requalification training (LORT) program. These evaluations were similar to recertification efforts at Salem which were initiated earlier. The objectives of the evaluations were to verify that the operators could operate the plant safely, and to assess operator competency to assure that mistakes made in the past would not continue to occur. The evaluations consisted of dynamic simulator, plant walkthrough, and written evaluations. The evaluations were not considered part of the NRC required requalification examinations. The format of the evaluations was similar to the requalification examinations with modifications to the walkthrough and written evaluations, and to the acceptance criteria for the evaluations.

The inspection was an announced observation and review of the recertification evaluations. The inspector observed the dynamic simulator evaluations of three shift crews and reviewed the results of the walkthrough and written evaluations administered to the crews. The inspector also reviewed the selection and supervisory training of licensed senior reactor operators (SROs).

2.0 FINDINGS

2.1 Recertification Evaluations

The inspector observed common weaknesses in the areas of procedure use, communications, and directing shift operations in the performance of all three crews on the dynamic simulator evaluations. Two of the crews were evaluated by the facility as marginal in these competency areas and the remaining crew was evaluated as unsatisfactory in these competencies. All of the crews received performance enhancement training to address the identified weaknesses. The facility will not allow the crew that was evaluated as unsatisfactory to return to shift with the plant at power until they have been satisfactorily reevaluated. Three SROs were also evaluated by the facility as unsatisfactory on individual competency areas. They will receive remedial training and will have to be reevaluated prior to directing operations with the plant at power. None of the identified individual or crew weaknesses were significant enough to warrant immediate removal from licensed duties.

The inspector determined that the facility evaluators conducted thorough, detailed assessments of crew and individual competency for the dynamic simulator evaluations. The evaluators appropriately identified performance weaknesses, and their assessments progressively improved with respect to meeting the objectives of the recertification evaluation over the three evaluations observed by the inspector. The written performance standards for the simulator evaluations were minimal by intent because one of the objectives of the recertification evaluations was to assess and better define the performance standards and expectations. The inspector observed that the

facility evaluators often established or refined their performance expectations during the discussions following the simulator scenarios. Operations management acknowledged this observation and indicated that they planned to better define performance expectations. The inspector noted significant improvement in definitive performance expectations during observation of the third evaluation.

Four SROs and one reactor operator (RO) performed marginally on the written evaluations. The same RO also performed marginally on the walkthrough evaluation. The remainder of the operators performed satisfactorily on the written and plant walkthrough evaluations. The facility intends to provide performance enhancement training to the operators that performed marginally. These operators will have to perform satisfactorily on reevaluations prior to performing licensed duties with the plant at power. The inspector did not review enough results to identify any generic weaknesses on the written or walkthrough evaluations. PSE&G intends to provide their assessment of the overall results of the evaluations and their plans for training enhancements to the NRC when the evaluations are complete.

2.2 SRO Selection and Supervisory Training

The results of the most recent initial license examinations indicated that PSE&G's process for selecting individuals for SRO licensing was effective. The license applicants were selected by operations management for participation in initial license training. The applicants also met the eligibility requirements of ANSI/ANS 3.1, 1981, "Selection, Qualification and Training of Personnel for Nuclear Power Plants." All five license applicants passed the most recent NRC initial license examinations with no significant weaknesses noted in directing shift operations or communications. One individual was withdrawn from license training prior to taking the NRC examination indicating that the assessment and selection process continued even after enrollment in license training. In addition to holding an SRO license, NSSs must be qualified by the Supervisory Assessment System (SAS), a process that assesses knowledge, skills, and abilities determined by a job analysis of a variety of supervisory positions. Individuals can participate in SRO license training without being SAS-qualified, but must successfully complete SAS prior to being assigned to an NSS position.

Over the past several years, the operations department had not ensured that all training program specifications for supervisory training were met for newly assigned NSSs; however, actions have been taken recently to improve the tracking of supervisory training and to ensure that all training is completed. The facility program specifies that core supervisory training courses must be completed within 12 months of being assigned to an NSS position and the remainder of the specified courses must be completed within 24 months of assignment. Credit for some of the core courses is given for completion of the licensed SRO training program and SRO license applicants normally receive some of the additional required training while they are waiting for the results of their license examinations. Several months ago, PSE&G training personnel performed an audit of the SNSS and NSS supervisory training records and the operations department training coordinator checked the department training records. These reviews identified a few NSSs and SNSSs that had not

completed all of the specified supervisory training courses. Arrangements were made for these operators to complete the training or be given credit for equivalent experience or training. The inspector also identified a few instances in which the training had been completed, but not within the specified time frame. The practice of temporarily assigning individuals to NSS positions prior to making permanent assignments appeared to contribute to the failure to meet the training requirements. A NSS qualification card is currently being developed which should improve the tracking of training requirements for newly assigned NSSs.

Station management has recently placed more emphasis on developing and maintaining the supervisory skills of the operations department staff. Two supervisory training courses, "Business Leadership Development (BLD)" and "Management Action Response Checklists (MARC)," have been developed and recently upgraded to replace previous courses that were very rudimentary in nature. All NSSs and SNSSs that have not had the current versions of these courses are expected to take these courses within the next year. Additionally, all other SRO-licensed individuals that are expected to maintain their licenses are expected to take BLD and MARC training. Station management has also strongly recommended that all first-line supervisors and above participate in supervisory training courses beyond the required curriculum.

2.3 Management Oversight

The inspector judged the operations department management's oversight of the recertification evaluations to be effective. The operations manager and operating engineer (shift) established the objectives and reviewed and approved all of the evaluation materials for the recertification evaluations. Even though performance expectations were not always clearly established in advance, operations management ensured that the performance of the crew and individual operators on the dynamic simulator evaluations was assessed thoroughly, and that the results were clearly communicated so that clear performance standards could be established in the future. Operations management was also integrally involved in assessment of the written and walkthrough evaluation results and definition of the subsequent performance enhancement and remedial training plans. The quality assurance (QA) organization also monitored the recertification evaluations, including direct observation of the dynamic simulator evaluations for one of the crews.

3.0 CONCLUSIONS

Common weaknesses in the areas of procedure use, communications, and directing shift operations were observed by the inspector in the performance of all three crews on the dynamic simulator evaluations. None of the identified individual or crew weaknesses were significant enough to warrant immediate removal from licensed duties. The facility evaluators conducted thorough, detailed assessments of crew and individual competency that met the objectives of the recertification evaluations and were consistent with the inspector's observations. Written performance standards were minimal and the facility evaluators often established or refined their performance expectations during

discussions after the simulator scenarios. However, operations management recognized the need to better define performance expectations, and improvement was noted in this area over the course of the observed evaluations.

Previously, the operations department had not ensured that all facility-specified supervisory training was completed for newly assigned NSSs; however, actions have been taken recently to improve the tracking of supervisory training and to ensure that all training expectations are met. Station management has recently placed more emphasis on developing and maintaining the supervisory skills of the operations department staff.