May 2, 2005

Mr. William Levis
Senior Vice President and Chief Nuclear Officer
PSEG Nuclear, LLC - N09
P. O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: SALEM AND HOPE CREEK NUCLEAR GENERATING STATIONS - NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000272/2005007, 05000311/2005007, AND 05000354/2005006

Dear Mr. Levis:

On March 18, 2005, the NRC completed a team inspection at your Salem Unit 1 & 2 and Hope Creek reactor facilities. The enclosed report documents the inspection findings which were discussed on March 18, 2005, with Mr. Joyce and other members of your staff during an exit meeting.

This inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, compliance with the Commission's rules and regulations, and with the conditions of your license. Within these areas, the inspection involved examination of selected procedures and representative records, observation of activities, and interviews with personnel. This inspection was conducted primarily for the purpose of assessing the problem identification and resolution (PI&R) program at Salem, but was expanded to include site-wide PI&R activities, including Hope Creek. This expanded scope was consistent with the implementation of the Reactor Oversight Process Action Matrix Deviation Memorandum for Salem/Hope Creek dated August 23, 2004.

On the basis of the samples selected for review, the team concluded that, in general, problems were adequately identified, evaluated and corrected. However, the team noted several examples of inconsistent implementation of your corrective action program. The team identified weaknesses in each of the three fundamental areas: problem identification, evaluation, and the effectiveness of corrective actions. The team identified six Green findings. Four of these findings were determined to be violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you contest these non-cited violations, you should provide a response with the basis for your denial within 30 days of the date of this inspection report, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at the Salem and Hope Creek facilities.

In addition, several issues of minor significance were identified by the team and entered into the corrective action program by your staff. These items involved conditions adverse to quality that had not been entered into the corrective action program, had narrowly focused problem evaluations, or corrective actions that were either ineffective or not implemented. None of these minor deficiencies resulted in a challenge to system operability or reliability.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Marvin D. Sykes, Chief
Performance Evaluation Branch
Division of Reactor Safety

Docket Nos. 50-272, 50-311, 50-354
License Nos. DPR-70, DPR-75, NPF-57

Enclosure: Inspection Report 50-272/05-007, 50-311/05-007, 50-354/05-006
w/Attachment: Supplemental Information

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REGION I

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|---|---|
| Docket Nos: | 50-272, 50-311, 50-354 |
| License Nos: | DPR-70, DPR-75, NPF-57 |
| Report No: | 05000272/2005007, 05000311/2005007, 05000354/2005006 |
| Licensee: | PSEG Nuclear LLC |
| Facility: | Salem Nuclear Generating Station, Unit 1 and 2<br>Hope Creek Nuclear Generating Station |
| Location: | P.O. Box 236<br>Hancocks Bridge, NJ 08038 |
| Dates: | February 28 - March 18, 2005 |
| Inspectors: | B. Welling, Senior Reactor Inspector (Team Leader)<br>J. Schoppy, Senior Reactor Inspector<br>D. Florek, Senior Project Engineer<br>K. Young, Reactor Inspector<br>G. Malone, Resident Inspector, Salem<br>J. Benjamin, Reactor Inspector<br>J. Lilliendahl, Reactor Inspector |
| Approved by: | Marvin D. Sykes, Chief<br>Performance Evaluation Branch<br>Division of Reactor Safety |

Enclosure

## SUMMARY OF FINDINGS

IR 05000272/2005007, IR 05000311/2005007, IR 05000354/2005006; 2/28/2005 - 3/18/2005; Salem Units 1 and 2 and Hope Creek; biennial baseline inspection of the identification and resolution of problems; problem identification and resolution.

This inspection was conducted by six region-based inspectors and a resident inspector. The inspection identified six Green findings, four of which were non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)." Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

Identification and Resolution of Problems

The team determined that, in general, problems were adequately identified, evaluated and corrected. However, the team noted that PSEG's implementation of their corrective action program was inconsistent. The team identified weaknesses in each of the three fundamental areas: problem identification, evaluation, and the effectiveness of corrective actions. The team identified six findings in which PSEG did not properly evaluate and correct conditions adverse to quality. Several staff interviews were conducted during the inspection. The team identified no new safety conscious work environment issues.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. (Hope Creek) The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because PSEG did not identify a condition adverse to quality in August 2004, related to open torque switch bypass settings for a core spray injection valve that did not stroke open during in-service testing and, as a result, did not establish appropriate corrective action.

  The finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute for equipment performance and it affected the objective of ensuring the availability and reliability of the core spray system. The finding was of very low safety significance (Green) based upon Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," Phase 1 analysis, because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather). The performance deficiency had a problem identification and resolution (evaluation) cross cutting aspect. Engineering incorrectly evaluated documented data on the open torque switch bypass setting

for the valve and as a result did not identify that the settings were outside of range established in the site's procedures. (Section 4OA2.b.2.1)

- Green. (Hope Creek) The team identified a finding of very low safety significance because on at least seven occasions neither loop of service water was available to supply emergency makeup to the safety auxiliaries cooling system (SACS). The Hope Creek Updated Final Safety Analysis Report indicates that a safety-related makeup supply from service water is available.

  This finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute for equipment performance and it affected the objective to ensure the availability and reliability of the SACS system. The finding was of very low safety significance (Green), based on a Phase 1 significance determination process (SDP) because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather). The issue was similarly of very low risk in the Initiating Events cornerstone because the finding did not increase the likelihood of a loss of SACS event because the trains are not normally cross-connected and an inventory loss on one train would not reasonably be expected to impact the redundant train concurrently. The performance deficiency had a problem identification and resolution (evaluation) cross cutting aspect. Hope Creek did not fully evaluate the impact of this condition on the SACS system. (Section 4OA2.b.2.2)

- Green. (Salem) The team identified a finding of very low safety significance because PSEG did not properly follow its procedural guideline for conducting an apparent cause evaluation (ACE) in response to a component cooling water configuration control problem that caused the 11 residual heat removal heat exchanger to be inoperable.

  This finding is more than minor because it is associated with the Mitigating Systems cornerstone's configuration control attribute and affected the cornerstone's objective to ensure the availability and reliability of systems that respond to initiating events. This finding was of very low safety significance (Green) based on a Phase 1 SDP, because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather). The performance deficiency had a human performance cross cutting aspect. The individuals performing the ACE did not follow the site procedural guidelines for the conduct of the ACE. (Section 4OA2.b.2.3)

- Green. (Salem) The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for ineffective and untimely corrective action associated with the 1C1 125VDC battery charger. NRC inspection report 05000272, 05000311/2004004, documented several previous battery charger failures, but timely corrective actions were not implemented to eliminate the identified defective condition for all battery chargers of identical design and like

vintage. Consequently, the failure of another battery charger occurred on November 16, 2004.

This finding was more than minor because it was associated with the equipment performance attribute, and it affected the Mitigating Systems cornerstone objective to ensure the capability and reliability of systems that respond to initiating events. The finding was of very low safety significance based upon a Phase 1 SDP, because the finding was not a design deficiency, it did not result in an actual loss of safety function, and it did not screen as potentially risk significant for externally initiating events (seismic, flooding, or severe weather). The performance deficiency had a problem identification and resolution (corrective actions) cross cutting aspect. (Section 4OA2.c.2.1)

- Green. (Salem) The team identified non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for failure to implement timely and effective corrective actions following repetitive failures of the control area chillers due to a deficient temperature control system.

  The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone. This finding affected the cornerstone objective, in that it reduced the availability and reliability of a system that responds to initiating events. The finding was determined to be of very low safety significance (Green) based upon a SDP Phase 1 analysis, because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather). The performance deficiency had a problem identification and resolution (corrective actions) cross cutting aspect. (Section 4OA2.c.2.2)

- Green. (Hope Creek) The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for PSEG's failure to take adequate corrective action to address recurring challenges to standby service water (SW) pumps due to silting and debris in the out of service strainers.

  The finding was more than minor because it affected the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. The finding was associated with the attribute of equipment performance (SW system availability and reliability). This issue also impacted the Initiating Events cornerstone because unavailability of one train of SW increased the likelihood of a loss of service water (LOSW) event. The finding was determined to be of very low safety significance based upon a SDP Phase 2 analysis. The performance deficiency had a problem identification and resolution (corrective actions) cross cutting aspect. (Section 4OA2.c.2.3)

B. Licensee-Identified Violations

None.

Report Details

## 4. OTHER ACTIVITIES (OA)

### 4OA2 Problem Identification and Resolution

a. Effectiveness of Problem Identification

(1) Inspection Scope

The team reviewed PSEG's corrective action program procedures, attended the daily initial screening and management review meetings, and attended a corrective action review board (CARB) meeting to understand the threshold for identifying problems and to assess management involvement with the corrective action process. The team noted that problems were identified through the initiation of notifications (NOTFs).

Several NOTFs were reviewed to determine whether PSEG was appropriately identifying, characterizing, and entering problems into the corrective action process. The team selected NOTFs to cover the seven cornerstones of safety in the NRC Reactor Oversight Process (ROP). The team reviewed NOTFs initiated subsequent to the last NRC problem identification inspection that was completed in March 2003. In addition, the team considered risk insights from the station probabilistic risk assessments to focus the NOTF sample selection and system walkdowns on risk significant components. Attachment 1 lists the NOTFs selected for review.

The team reviewed items from PSEG's maintenance, operations, engineering, and oversight processes to verify that PSEG appropriately considered problems for entry into the corrective action program. Specifically, the team reviewed a sample of control room deficiency and operator work-around lists, maintenance orders, operability determinations, engineering system health reports, quality assessment reports, and departmental self-assessments. The team reviewed these documents to ensure that underlying problems associated with each issue were appropriately evaluated and resolved. The team also conducted walkdowns of control room panels and selected plant equipment to independently assess whether problems were being adequately identified and addressed.

On August 23, 2004, the NRC's Executive Director for Operations approved a deviation from the NRC's Action Matrix to provide a greater level of oversight for the Salem and Hope Creek stations than would typically be called for in the Action Matrix. One provision of the deviation memorandum provided for the enhancement of existing reactor oversight process (ROP) baseline inspections. In accordance with this deviation, the Salem inspection team was augmented with additional inspectors and the scope of the review was expanded to include site-wide PI&R issues and additional NOTFs.

(2) Findings and Observations

No findings of significance were identified.

The team determined that, in general, PSEG adequately identified discrepant conditions and initiated NOTFs where appropriate. However, the team identified several examples where PSEG did not enter conditions adverse to quality into the corrective action system and did not identify and correct other minor deficiencies in a timely manner. During the plant walkdowns, the team observed several minor deficiencies that had not been previously identified and entered into the corrective action program. PSEG initiated numerous NOTFs and corrected some minor deficiencies on the spot. In some cases, these items reflected an acceptance of minor equipment deficiencies or poor implementation of program guidance (scaffold and transient combustible material control). Some examples included:

- An improper pressure regulator reading on the Salem 13AF21 flow control valve (20228787).

- Six inches of standing water in the fresh water and fire protection water supply to auxiliary feedwater (AFW) trench on 88' elevation of the Salem Unit 2 turbine building (20228636).

- A leak at the wall penetration where A SW loop exits the Hope Creek reactor building (20226813).

The team also found that the use of equipment malfunction information system (EMIS) tags was inconsistent. During plant walkdowns, the team identified several EMIS tags hanging that should have been removed following corrective maintenance. EMIS tags left hanging after work completion potentially mask the degraded condition should it recur. Alternately, the team noted several examples where previoiusly identified deficiencies did not have EMIS tags applied. These EMIS tag deficiencies represent a recurring corrective action program (CAP) weakness based upon previous NRC PI&R inspection observations at Salem and Hope Creek.

The team identified that PSEG had several hundred NOTFs that were not reviewed by a supervisor. Although these items had been screened in a timely manner, the delays in supervisory review may give the impression to plant staff that the issue is insignificant. PSEG wrote NOTF 20227808 to address this item.

The team independently evaluated the problem identification deficiencies noted above for potential significance. The team determined that none of the individual issues were of more than minor significance based upon the guidance in Inspection Manual Chapter (IMC) 0612, Appendix E, “Examples of Minor Issues.” However, these NRC identified issues indicated weaknesses in PSEG problem identification.

Quality Assessment (QA) audits, and self-assessments identified adverse conditions and negative trends. They were generally self-critical and consistent with the team’s findings.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The team reviewed the NOTFs listed in Attachment 1 to determine whether PSEG adequately prioritized, evaluated, and resolved problems. The review focused on the appropriateness of the assigned significance, the timeliness of resolutions, and the scope and depth of the root or apparent cause analyses. A portion of the items chosen for review were age-dependent, and accordingly, the scope of review was expanded to five years. In this area, the team reviewed problems in the service water system and auxiliary feedwater system. The team also considered risk insights from PSEG's probabilistic risk assessment to help focus the sample to the 1) component cooling water, 2) 4 KV AC power, and 3) safety injection systems.

The team also selected NOTFs associated with previous NRC non-cited violations (NCVs) and findings to determine whether PSEG had evaluated and resolved problems related to applicable regulatory requirements and standards. The team reviewed PSEG's evaluation of industry operating experience (OE) information for applicability to their facility. The team also reviewed PSEG's assessment of equipment operability, reportability requirements, and the potential extent of the problem.

(2) Findings and Observations

In general, PSEG adequately prioritized and evaluated the issues and concerns entered into the CAP. However, the team identified three Green findings related to incomplete or ineffective evaluations of problems.

Plant personnel were generally effective at classifying and performing operability evaluations and making reportability determinations for discrepant conditions. Yet, the team identified two instances in which PSEG did not adequately perform operability reviews or did not do so in a timely manner. These involved air found in residual heat removal (RHR) piping at Hope Creek (20228105), and the operability of the Hope Creek control room emergency filtration boundary during fire damper testing (20227644). The team also noted several weaknesses in PSEG's prioritization and evaluation of degraded conditions.

The team observed that the initial screening committee team did not always evaluate such factors as potential risk and uncertainty. This was particularly evident when assigning priority for an issue involving the potential for nitrogen voiding in Salem ECCS piping (20227725). In addition, the management screening committee did not assign follow up action commensurate with the potential safety significance during their initial review of this issue.

The team identified that Salem engineering and operations did not fully evaluate a condition adverse to quality involving ongoing nitrogen leakage from the No. 11 safety injection (SI) accumulator. In particular, PSEG did not assess where the nitrogen was going and did not fully evaluate the potential for nitrogen voiding of Salem ECCS piping or ECCS pump cavitation. The team noted that a senior reactor operator's operability evaluation on August 21, 2004, stated "11 SI accumulator pressure is still within tech

spec. No operability concern." On March 9, 2005, PSEG initiated NOTF 20227725 to evaluate this issue. On March 18, PSEG management determined that an apparent cause evaluation (70045518) was needed to determine potential leakage paths, areas of potential nitrogen migration, methods of detection, if voids exist, and the leakage rate. The team concluded that this issue will be treated as an unresolved item (URI). An unresolved item is an issue requiring further information to determine if it is acceptable, if it is a finding, or if it constitutes a deviation or violation of NRC requirements. In this case, additional NRC inspection will be required to review PSEG's evaluation of the issue. **(URI 05000272/2005007-01)**

During reviews of apparent cause evaluations, the team identified several narrowly focused evaluations that appeared to address the symptoms of equipment problems rather than the underlying causes. This was evident in evaluations for Salem control area chiller trips (20230185), and multiple failures of an auxiliary feedwater pump steam admission valve, 1MS132 (20207415). The narrowly focused evaluations sometimes led to repetitive problems. In certain instances, the licensee did not perform extent of condition evaluations, as in the case of a Hope Creek core spray injection valve issue (20227627). In other cases, the evaluations were incomplete. For example, engineering erroneously excluded five relief valves from an 'A' SACS loop inventory loss evaluation (20226834), and engineering did not evaluate missing packing in a leaking auxiliary feedwater pump motor bearing thermocouple (20190639).

For NRC non-cited violations (NCVs), the team noted instances in which PSEG did not evaluate or address the performance deficiencies associated with these NCVs. For example:

- Evaluation 70037473 for NCV 50-272/04-02-02 did not address why the inservice testing program did not evaluate the degrading condition of the 12 SW 65 valve; and
- Evaluation 70038387 for NCV 50-272/04-03-10 did not address the inadequate maintenance procedures that led to an inadvertent safety injection signal actuation.

The team noted that root cause evaluations were generally complete. The root cause methodology was typically identified in the evaluations.

The team independently evaluated the CAP deficiencies noted above for potential significance. The team determined that none of the individual issues were findings of more than minor significance based upon the guidance in IMC 0612, Appendix E, "Examples of Minor Issues." However, these issues represented examples where the corrective actions for identified conditions were not adequately prioritized and evaluated.

.1 Core Spray Motor-Operated Valve Deficiency

Introduction. The team identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because PSEG did not identify a condition adverse to quality in August 2004, related to open torque switch bypass settings for a core spray

injection valve that did not stroke open during in-service testing and, as a result, did not establish appropriate corrective action.

Description. On August 21, 2004, Hope Creek operators initiated NOTF 20201072 to document that the train A core spray outboard injection valve (MOV BE-HV-F004A) did not stroke open during an in-service test. Operators determined that the valve remained operable because the valve is normally open and remains open during an accident, the valve has no safety function to close, and the valve stroked open successfully in two subsequent attempts. Engineering's assessment of the valve response was a loose wire or dirty contact and initiated WO 60047832 to inspect the limit switch compartment in November 2005. On February 1, 2005, operators initiated NOTF 20222530 to document that the A core spray outboard injection valve again failed to stroke open during a in-service test. Operators declared the valve inoperable and maintenance worked the valve using WO 60047832.

The team determined that, in response NOTF 20201072, engineering incorrectly evaluated the open torque switch bypass (OTSB) setting for the valve and as a result did not identify an incorrect setting and thereby did not establish the appropriate corrective action to ensure that the valve would stroke open when demanded. The valve has both an automatic and manual OTSB bypass circuit that bypasses the OTSB if needed during an accident. The team concluded that since 1993 the OTSB setting for this valve had been set at 6% and this setting was outside of the range (15% - 50%) permitted by PSEG procedures. In response to NOTF 20201072 Engineering reviewed the diagnostic VOTES test performed in 2002 for the valve and did not recognize that the documented OTSB setting (12% of the open stroke) was outside of the range specified by PSEG procedures. As a result, engineering's assessment that the valve response was due to a loose wire or dirty contact was incorrect and the corrective action to inspect the limit switch compartment in November 2005 was insufficient to correct the OTSB setting. In response to NOTF 20222530, engineering recognized that not only was the documented OTSB setting in the VOTES test performed in 2002 out of specification it was also documented in error and was actually set at 6% of open stroke. The VOTES testing in 1993 (WO 921023100) showed the OTSB setting at 6% of open stroke. As a result, PSEG took corrective action and adjusted the setting to 24% of the open stroke. The team noted that this repeat failure resulted in approximately 24 hours of additional unplanned unavailability of the A core spray subsystem.

Analysis. The performance deficiency is that PSEG did not identify an out of specification OTSB setting in August 2004 and, as a result, did not develop appropriate corrective action as required by PSEG corrective action program. The finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute for equipment performance and it affected the objective to ensure the availability and reliability of the core spray system. The finding was of very low safety significance (Green) based upon Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," Phase 1 analysis, because it was not a design deficiency, did not result in an actual loss of safety function of a single train of core spray for greater than its TS allowed outage time, and

did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather).

A contributing cause of this finding relates to the evaluation subcategory of the cross cutting area of problem identification and resolution. Engineering incorrectly evaluated documented data on the open torque switch bypass (OTSB) setting for the valve and as a result did not identify that the settings were outside of range established in the site's procedures.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to the above, in August 2004, PSEG did not identify that the open torque switch bypass (OTSB) setting for a core spray injection valve was out of the required range in plant procedures and, as a result, PSEG did not establish corrective actions to restore the OTSB settings to within the required range. However, because the finding was of very low safety significance and has been entered into the CAP (NOTF 20227627 and order 70045369), this violation is being treated as a NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000354/2005006-02)**

.2 Service Water Emergency Makeup Unavailability

Introduction. The team identified a Green finding because on at least seven occasions neither loop of service water was available to supply emergency makeup to the safety auxiliaries cooling system. The Hope Creek Updated Final Safety Analysis Report indicates that a safety-related makeup supply from service water is available for emergency use.

Description. The Hope Creek Updated Final Safety Analysis Report (UFSAR) Section 9.2.2.2 indicates that a safety-related makeup supply from service water (SW) is available, so that makeup water to the safety auxiliaries cooling system (SACS) can be provided during emergency conditions.

In June 2001, PSEG assumed mitigation capability credit for this design feature in evaluating the safety significance of excessive leakage from the A SACS loop (NRC Inspection Report 50-354/01-07, Section 4OA3.1). Credit was given for operators' ability to recover the A SACS loop. In addition, in January 2004, engineering credited this safety feature in evaluating the continued operability of the A SACS loop (70035939).

The team identified at least seven instances since April 2000 when both loops of SW emergency makeup to SACS were unavailable for significant periods of time (the longest from 1/13/04 through 4/7/04). PSEG could not produce an engineering evaluation to support the unavailability times, and there was no clear process in place to ensure that SW makeup capability is available. Operations initiated NOTF 20227046 to evaluate this condition.

Analysis. The unavailabilty of both service water makeup supplies to the SACS is a performance deficiency since the unavailability of both supplies is not consistent with the UFSAR and was reasonably within PSEG's ability to appropriately identify and correct. This issue was more than minor because it was associated with Mitigating Systems cornerstone attribute for equipment performance and it affected the objective to ensure the availability and reliability of the SACS system. The issue was of very low safety significance (Green) using the Phase 1 SDP worksheet for at power situations for the Mitigating Systems cornerstone because the finding was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather). The issue did not increase the likelihood of a loss of SACS event because the trains are not normally cross-connected and an inventory loss on one train would not reasonably be expected to impact the redundant train concurrently. The performance deficiency had a problem identification and resolution (evaluation) cross cutting aspect. Hope Creek did not fully evaluate the impact of this condition on the SACS system.

Enforcement. None **(FIN 05000354/2005006-03)**

.3 Component Cooling Water System Configuration Control

Introduction. The team identified a Green finding because PSEG did not properly follow their procedural guideline for conducting an apparent cause evaluation in response to a component cooling water configuration control problem that caused the unplanned inoperability of the 11 residual heat removal heat exchanger.

Description. On November 23, 2004, during testing, component cooling water (CCW) flow through the 11 residual heat removal (RHR) heat exchanger was determined to be 3050 gpm. This flow rate was below both the required testing range of 4620 to 4780 gpm and the 4000 gpm minimum UFSAR limit required for accident cooling. Operators adjusted the 11 RHR CCW manual outlet valve (11CC15) to bring the flow up to 4700 gpm per site procedures to restore the operability of the heat exchanger. PSEG entered this configuration control problem into its corrective action program (NOTF 20212591) and specified that an apparent cause evaluation be performed to determine the cause of the configuration control problem and recommend corrective actions.

PSEG's apparent cause evaluation (ACE) (70043024) concluded that the cause was indeterminate. One possible cause identified by PSEG was internal looseness within the valve or valve operator. But this was viewed by PSEG to be rare and unlikely with this relatively new valve that had seen little wear. A corrective action from the ACE was to check for internal looseness within the 11CC15 valve or valve operator. On December 8, 2004, PSEG observed no signs of looseness during surveillance testing.

On March 15, 2004, the team identified that PSEG did not perform an adequate ACE of this problem. PSEG did not follow the site procedural guideline for conducting an ACE, as per (NC.CA-TM.ZZ-0005, Rev. 16). Specific examples in the ACE guideline that were not performed or fully implemented included:

- The evaluators did not verify that equipment was quarantined, as necessary, as specified in step 4.2.1 of the procedure.

- The evaluators did not collect available data (facts) to determine what happened (including the extent of condition), how it happened, and why it happened, per step 4.2.2 of the procedure.

- The evaluators did not conduct interviews or discuss the problem with operators and personnel who could have changed the position of the 11CC15 valve, per the guideline.

- The evaluators did not determine the inappropriate actions, equipment failure modes and apparent cause(s) using the facts obtained and a Cause and Effect Analysis or other suitable method, per the guideline.

In addition, PSEG had not considered recurring instances of Unit 1 low CCW flow conditions identified during surveillance testing since December 15, 2003 (NOTFs 20135502, 20202226, and 20210439) as part of the ACE evaluation. As a result, the inspectors concluded that had PSEG performed the steps above, PSEG could have obtained information to determine if the improper configuration was due to human or equipment error.

Analysis. The inspectors determined that PSEG's failure to conduct its ACE of the CCW configuration control problem in accordance with its procedure was a performance deficiency. The evaluators did not use substantial attributes of the site guideline or information from prior similar situations for performing an apparent cause evaluation. This finding was reasonably within PSEG's ability to foresee and prevent. The finding was more than minor because it was associated with the Mitigating Systems cornerstone configuration control attribute and affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events. The finding was of very low safety significance (Green) based upon Phase 1 SDP per IMC 0609, Appendix A, "Determination of Significance of Reactor Inspector Findings for At-Power Situations." This finding was of very low safety significance (Green), because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather).

A contributing cause of this finding is related to the organizational subcategory of the human performance cross cutting area. The individuals performing the ACE did not follow the site procedural guidelines for the conduct of the ACE.

Enforcement. None. **(FIN 50000272/2005007-04)**

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The team reviewed PSEG's corrective actions to determine whether the actions taken appropriately addressed the identified causes of the problems. The team also reviewed PSEG's timeliness in implementing corrective actions and their effectiveness in preventing recurrence of significant conditions adverse to quality. Furthermore, the team assessed the backlog of corrective actions to determine if any, individually or collectively, represented an increased risk due to the delay in implementation.

(2) Findings and Observations

There were three Green findings identified during this inspection that involved ineffective or untimely corrective actions. In addition, the team noted some weaknesses in PSEG's implementation of CAP program guidance with respect to resolution of degraded conditions, documentation of actions, and completion of identified corrective actions. Examples included:

- PSEG closed out corrective actions associated with two AFW vent valves without completing the identified actions (20227347).

- PSEG had not effectively resolved several longstanding equipment deficiencies that potentially caused unnecessary operator burdens such as spent fuel pool (SFP) cooling pump trips, SACS automatic isolation valve (HV2522A-F) repeat work due to a design deficiency, and Hope Creek SW system ultrasonic flow instrumentation issues.

- PSEG closed out a corrective action for a root cause evaluation (Foreign Material Exclusion, NOTF 20163339, activity 0460) without completing the identified action.

- Condition Report 70032452 identified that the 15 containment fan cooler unit bearing was overpacked with grease resulting in higher than normal bearing temperatures, a repetitive problem, yet the evaluation contained no corrective actions.

The team reviewed several instances in which PSEG (both Quality Assessment and the line organization) initiated NOTFs which identified ineffective or untimely corrective actions; however, PSEG did not follow through to ensure that the additional corrective actions to address the original issue were actually completed. Examples included the unauthorized temporary modification on AFW pumps (20135512, 20156974, 20228908), a Salem operator burden involving a high pressure condition on the SW system (70037183, 20186028, 70037127), an industrial safety concern at the Hope Creek SW intake (20136274, 20189242, 20227360), and incomplete closure of corrective actions from a March 2003 root cause evaluation (20136006) related to a Hope Creek power transient. In this last case, several deficiencies raised by QA were not addressed.

The team independently evaluated the CAP deficiencies noted above for potential significance. The team determined that none of the individual issues were findings of more than minor significance based upon the guidance in IMC 0612, Appendix E,

"Examples of Minor Issues." However, these issues represented examples where the corrective actions for identified conditions were not effective.

.1 Untimely Problem Resolution for Repeat Failures of 125VDC Battery Chargers

Introduction. A Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified when PSEG found a blown fuse and an associated charred transducer card during periodic inspection of the 1C1 125VDC battery charger. This was a repeat occurrence of several battery charger failures as documented in NRC Inspection Report (IR) 05000272, 05000311/2004004, issued November 9, 2004.

Description. On November 16, 2004, PSEG technicians identified a blown fuse and a charred transducer card during periodic inspection of the 1C1 125VDC battery charger. The periodic inspection was established as a result of previous similar failures of these battery chargers.

As stated in NRC IR 05000272, 05000311/2004-004, the voltage transducers had been installed in the early 1990's. The transducer card failure typically caused a one amp fuse, AXF2-1, to blow, thus causing the battery charger to operate at reduced capacity, because the fuse also supplies a portion of the battery charger firing circuits. The reduced capacity caused the battery charger not to meet its Technical Specification (TS) requirement.

The battery chargers are safety related. Salem Units 1 and 2 each have a primary and a back-up battery charger associated with all three vital DC buses per unit. There are a total of twelve battery charger units at Salem.

On October 13, 2004, PSEG initiated NOTF 20207005 which identified a lack of timeliness in correcting multiple failures of 125VDC battery charger transducers. The NOTF indicated that on June 14, 2004, PSEG engineers received Plant Health Prioritization Committee approval to initiate a design change package (DCP) for removal of the unused transducers on all battery chargers because of the number of previous failures. However, it was not until another failure on July 30, 2004, that the minor modification package was written but not issued. The NRC reviewed this issue and determined that PSEG had not implemented timely corrective actions to eliminate the identified defective condition for all battery chargers of identical design and like vintage.

On November 16, 2004, PSEG technicians identified another blown fuse and a charred transducer card during periodic inspection of the 1C1 battery charger. PSEG still had not implemented the DCP to abandon the transducer cards in place. The team verified that work orders to remove and spare wires with all battery charger transducer cards were ultimately completed by the end of December 2004. The team determined that this was another example of failure to implement timely corrective actions for this issue.

Analysis. The performance deficiency associated with the 1C1 battery charger failure has problem identification and resolution cross cutting aspects. Specifically, PSEG did not implement a long term resolution for a number of transducer card failures in a timely

manner. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function, and it was not the result of any willful violation of NRC requirements. This issue was more than minor because it was associated with the equipment performance attribute, and it affected the Mitigating Systems cornerstone objective to ensure the reliability of systems to respond to initiating events. The team considered this issue a potential loss of a DC bus initiating event for the Initiating Events cornerstone and determined that the failure mechanism, potential reduced charging capacity, did not increase the likelihood of a loss of a DC bus. This finding was of very low safety significance (Green) using the Phase 1 SDP worksheet for at power situations because the finding was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather). The performance deficiency had a problem identification and resolution (corrective actions) cross cutting aspect.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires that in the case of significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective actions taken to preclude repetition. Contrary to the above, on November 16, 2004, PSEG did not preclude repetition of a failed safety-related battery charger due to a defective transducer card, a significant condition adverse to quality, when the 1C1 battery charger was found with a blown fuse and charred transducer card. PSEG NOTFs documented several battery charger failures for identical reasons. However, because the finding is of very low safety significance and had been entered into the corrective action program (20211713), this violation is being treated as an NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000272, 05000311/2005007-05)**

.2 Deficient Control Area Chiller Controls

Introduction. A Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for the failure to correct a condition adverse to quality involving repetitive control area chiller failures.

Description. PSEG identified that an obsolete and inaccurate temperature control system has led to control area chiller trips, extended equipment outages, and equipment damage. The calibration drift associated with these controls has led to spurious freeze protection trips and fatigue failure of internal compressor components including cotter pins and unloader forks. The deficient control circuit caused unloader devices to cycle more frequently than expected resulting in component failures.

On January 21, 2003, an instrument and controls (I&C) technician found a temperature control switch out of calibration for the 23 chiller unit. An evaluation was performed under order 70029166 which identified a history of calibration drifts and resultant chiller unit trips. The chiller units tripped on a freeze protection logic that is affected by the temperature drift. The evaluation identified that the temperature control circuit which affects unit startup, loading and protective trips, is obsolete and does not have an accuracy acceptable for its intended use. The evaluation identified sixteen prior

examples of NOTFs written to identify calibration drifts and unit trips since October 11, 2000. The evaluation recommended redesigning the controller to reduce inaccuracy and address obsolescence.

On December 9, 2003, the 23 chiller unit tripped on a freeze protection feature, and condition report 70035495 was generated to evaluate the condition. The evaluation determined that the chiller trip was likely due to temperature drift of the control circuit. A walkdown performed by PSEG on December 30, 2003, found all three control room chillers for Unit 2 running very lightly loaded which should occur only during heavy loading in the summer months. This was another indication that the control circuits were not operating correctly. The evaluation referenced prior chiller failures and industry operating experience from which corrective actions have not been implemented. The evaluation documented a corrective action to prevent recurrence (CAPR) to develop a modification to replace the problematic temperature control circuit with a more reliable temperature switch. The projected date of installation of the minor modification is September, 2006.

On December 29, 2004, the 21 chiller failed to pumpdown while shutting the unit down for maintenance. The evaluation (70044081) identified that a suction valve had broken into small pieces which subsequently became lodged in the discharge valve seating surface, creating a refrigerant leak path from the discharge to the suction side of the compressor. The evaluation concluded that the temperature control system was leading to the equipment damage and is scheduled to be corrected by minor modification 88074528 that is also found in condition report 70035495 above.

Analysis. The performance deficiency involved a failure to correct an identified deficiency with control area chiller temperature control systems that resulted in the failure of 21 control area chiller. The 21 chiller was inoperable for 222 hours. Traditional enforcement does not apply because the issue does not have any actual safety consequences or potential for impacting the NRC's regulatory function and is not the result of any willful violation of NRC requirements. This finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the objective to maintain the availability of mitigating systems. The finding was of very low safety significance (Green) based on a Phase 1 screening in Appendix A of Inspection Manual Chapter 0609, "Significance Determination of Reactor Inspection Findings for At-Power Situations," because the finding was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events (seismic, flooding, or severe weather). The performance deficiency had a problem identification and resolution (corrective actions) cross cutting aspect.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances be promptly identified and corrected. Contrary to the above, on December 29, 2004, PSEG's failure to correct a deficient chiller temperature control system that was identified in January 2003, led to a failure of the 21 control area chiller.

Because this finding is of very low safety significance and has been entered into the corrective action program in NOTF 20230185, this violation is being treated as a NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000311/2005007-06)**

.3 Silting Challenges to Standby Service Water Pumps

Introduction. The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because of inadequate corrective action for recurring challenges to standby SW pumps due to silting and debris in the out of service strainers.

Description. In February 2002, NRC inspectors identified a non-cited violation for ineffective corrective actions for malfunctions regarding standby SW pump performance due to intake silt accumulation (see NRC Inspection Report 50-354/02-02, Section 1R07.1). The inspectors had determined that PSEG had not implemented effective measures to ensure that the standby SW pump and traveling screens would perform properly under emergent SW pump start conditions. Based on historical data and engineering judgment, engineering recommended that operators rotate all idle SW traveling screens at least once every seven days to minimize the accumulation of silt in idle SW bays(70023083).

The team reviewed a sample of operator logs and NOTFs for the period March 2004 through March 2005 to assess the effectiveness of PSEG's corrective actions associated with challenges to standby SW pumps. The team noted the recommended actions had been discontinued and several additional instances had occurred which rendered the associated SW pump inoperable.

- On April 13, 2004, operators placed D SW pump in service and observed high SW strainer DP (off scale high) and a reduced SW flow. Operators declared the pump inoperable, and initiated NOTF 20185599. The pump had been out of service for ten days. The team noted that operators did not enter their SW abnormal procedure, HC.OP-AB.COOL-0001, and attempt to clear the strainer high DP condition per their operator training. Operators left the D SW pump in manual control until April 15 when they restarted the pump under an operations/engineering troubleshooting plan with the pump discharge valve in the lockout position. After approximately one minute, they opened the discharge valve and noted that the high strainer DP condition cleared. The pump was unavailable for approximately 53 hours. The team noted no documentation of any actions taken to determine the cause of the high strainer DP.

- On April 15, 2004, a control room operator initiated NOTF 20186090 to suggest implementing a SW pump swap weekly ("a routine implemented years earlier in response to SW pump problems") in order to mitigate the effects of silt settling out within the standby pump piping and strainer.

- On April 26, 2004, mechanics found an excessive amount of mud on the C SW strainer drum when they opened the strainer for a routine inspection (30085305). Maintenance initiated NOTF 20187632, which stated: “The as-found condition gives the appearance that a reverse flow path could be occurring in the strainer with the pump out of service.” There was no documentation of any actions taken to determine the cause of the excessive mud in the strainer or to evaluate a potential reverse flow path into the strainer.

- Based on the two occurrences with elevated silt level in out of service strainers, engineering implemented a weekly pump swap using HC.OP-DL.ZZ-0016 on May 18, 2004. Engineering determined that no further actions were required and closed NOTF 20186090 to trend.

- On June 5, 2004, operators initiated NOTF 20192262 to document a sustained high DP and low SW flow condition on the C SW strainer during a return to service post maintenance test. The C SW pump had been out of service for eight days. The team noted that operators did not enter their SW abnormal procedure. The pump was unavailable for approximately 15.5 additional hours. Operators also initiated NOTF 20192208 to document a concern that SW intake structure silting may soon affect system operability. In response to this concern, engineering performed an operability determination (70039631) and determined that all four SW trains were operable but degraded as a result of the high silt levels in front of the SW intake structure. Engineering mandated a 5-day pump swap to mitigate silt accumulation in the standby SW pump bays until the SW intake was desilted. Maintenance completed desilting operations by August 4, 2004, and engineering closed out the associated condition resolution operability determination (CROD).

- On October 29, PSEG initiated NOTF 20208989, “High Silt Levels in Service Water Intake,” based on questions from the NRC Senior Resident Inspector. On November 21, PSEG initiated NOTF 20212421, “Excessive Mud Found in C SSW Pump Bay.”

- On December 11, a control room operator initiated NOTF 20215238, “Possible Back Flow in C SW Strainer,” based on indications of strainer DP with the strainer and pump in standby. Engineering attributed the questioned DP to a clogged instrument tap.

- On January 26, 2005, operations initiated NOTF 20221348, “Service Water Grassing Event,” when the B SW strainer experienced a high DP condition (from 80 psid to over 200 psid) following a routine pump swap. Operators entered their abnormal procedure, and cleared the condition. On February 1, the initial screening committee closed this NOTF to trend. The team noted: (1) the B SW pump had been in standby for seven days; (2) operators did not appear to follow the guidance in HC.OP-AB.COOL-0001 for sustained high strainer DP; (3) HC.OP-AB.COOL-0001 does not define “sustained” which allows for individual operator interpretation; and (4) except during this pump start, there were no

reported grass attacks during the period January 25 - 27. This represented an additional 25 minutes of SW pump unavailability.

- On February 22, operations initiated NOTF 20225325 for a February 20 event involving a B SW strainer high DP condition following a routine pump swap. The operators entered their abnormal procedure and the equipment operator reported a small amount of grass on the A and B SW screens. Engineering documented that the condition is common during elevated grassing conditions. The team noted: (1) the B SW pump had been in standby for approximately ten days; (2) operators did not initiate a NOTF for the condition until prompted by the NRC Resident Inspector; and (3) based on a log review, except during this pump start, there were no reported grass attacks during the period February 19 - 22.

- On February 23, operations initiated NOTF 20225588 for a series of alarms that came in after they placed the C SW pump in service following a routine pump swap. The pump had been in standby for approximately 14 days.

- On March 1, based on a limited review of the NOTFs associated with silting and SW pump start issues, the team questioned whether there was a common cause associated with the issues and if previous corrective actions for the February 2002 NCV were effective. On March 8, engineering informed the team that they had completed their review of this concern and determined that three of the issues documented above were attributed to ineffective corrective actions for the standby pump silting concern, but that all issues since their CROD in July 2004 have been due to grassing only.

- On March 9, operations initiated NOTF 20227726 for a B SW strainer high DP condition following a routine pump swap. Engineering documented that the B strainer high DP condition was attributable to grassing conditions and that the issue should be closed to trend with no actions required. The team noted: (1) the B SW pump had been in standby for approximately eight days; and (2) based on a log review, except during this pump start, there were no reported grass attacks shortly before or after the B SW pump start.

In summary, the team determined that (1) operators and engineers did not demonstrate a questioning attitude (except as noted above) and were quick to accept an easy answer (must be grassing), (2) operators did not consistently follow their abnormal procedure, (3) engineering has not investigated a potential backleakage concern compounding the impact to the C SW strainer when in standby, and (4) PSEG corrective action for the silting impact on standby SW strainers has been inadequate and ineffective in addressing this recurring challenge to SW system reliability and availability.

Analysis. The team considered PSEG's failure to take timely and adequate corrective actions for the recurring challenges to standby SW pumps a performance deficiency. Given the repeated nature of the adverse condition and previous NRC NCV on this issue, the deficiency was reasonably within PSEG's ability to appropriately evaluate and correct prior to February 2005. Traditional enforcement does not apply because the

issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function and was not the result of any willful violation of NRC requirements. This issue was more than minor because it was associated with Mitigating Systems cornerstone attribute for equipment performance and it affected the objective to ensure the availability and reliability of the SW system. This issue also impacted the Initiating Events cornerstone because unavailability of one train of SW increased the likelihood of a loss of service water event. The inspectors completed a SDP Phase 1 screening of the finding and determined that a more detailed Phase 2 evaluation was required to assess the safety significance because the finding affected two cornerstones (Initiating Events and Mitigating Systems).

The Region I SRA conducted a Phase 2 evaluation, using the LOSW worksheet from Revision I of the Hope Creek Risk Informed Inspection Notebook, concluding that the finding was of very low safety significance (Green) relative to internal events core damage frequence increase (ΔCDF). The internal event ΔCDF was estimated to be 1 in 60,000,000 years of reactor operation. The dominant core damage sequence was a non-recovered LOSW with a failure to vent the containment. The SDP Phase 2 evaluation used the following assumptions:

- An exposure time of less than 3 days was used in the analysis. The D SW pump was unavailable for approximately 53 hours (4/13-15/2004). The C SW pump was unavailable for approximately 15.5 additional hours due to this condition on June 5, 2004. The B SW pump was unavailable for approximately 0.4 additional hours due to this condition on January 26, 2005.

  No fault exposure was assumed for the many times that SW pumps were kept in standby longer than seven days. Based on operators' past success in clearing the strainer high DP condition when they implemented their abnormal operating procedure actions,

- Operator recovery credit of 90% (10% chance of failure), based on the actual ability to recover the D, C, and B SW strainers.

- The SW system was considered to be a multi-train normally cross-tied support system. Therefore, the initiating event likelihood was increased by one order of magnitude for the associated special initiator.

The performance deficiency had a problem identification and resolution (corrective actions) cross cutting aspect.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. Contrary to the above, from February 2002, PSEG failed to take corrective action to determine the nature of the recurring challenges to standby SW pump strainers, and correct this condition in a timely manner to prevent subsequent strainer challenges and SW pump unavailability.

However, because the finding was of very low safety significance and has been entered into the CAP (NOTF 20228274), this violation is being treated as a NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000354/2005006-07)**

d. Assessment of Safety Conscious Work Environment

(1) Inspection Scope

Team members interviewed plant staff, observed various activities throughout the plant, and attended a cross section of meetings to determine if conditions existed that would result in personnel being hesitant to raise safety concerns to their management and/or the NRC.

(2) Findings and Observations

No findings of significance were identified.

4OA6 Meetings, Including Exit

The team presented the inspection results to Mr. Joyce and other members of PSEG management on March 18, 2005. PSEG management acknowledged the results presented. No proprietary information was identified during the inspection.

# ATTACHMENT 1

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel

| | |
|---|---|
| G. Barnes | Hope Creek Site Vice President |
| J. Barstow | Corrective Action Program Manager |
| K. Braendle | System Engineer (CCW) |
| D. Buirch | Superintendent, Fire Protection |
| K. Fleischer | Electrical/I&C Design Engineering Supervisor |
| C. Fricker | Salem Plant Manager |
| R. Henriksen | Corrective Action Program Supervisor |
| F. Hummel | System Engineer |
| S. Jones | Employee Concerns Manager |
| T. Joyce | Salem Site Vice President |
| T. Lake | SCWE Supervisor |
| M. Massaro | Hope Creek Plant Manager |
| C. Perino | Regulatory Assurance Director |
| G. Reed | Nuclear Quality Assurance Supervisor |
| D. Romashko | Nuclear Quality Assurance Manager |
| G. Sosson | Salem System Engineering Manager |
| B. Thomas | Senior Licensing Engineer |
| E. Villar | Senior Licensing Engineer |
| K. Wolf | System Engineer, Fire Protection |

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---|---|---|
| 05000272/2005007-01 | URI | Potential for nitrogen voiding of ECCS piping or ECCS pump cavitation. (Section 4OA2.b.2.1) |

Opened/Closed

| | | |
|---|---|---|
| 05000354/2005006-02 | NCV | Core spray injection valve found with an improper open torque switch bypass setting. (Section 4OA2.b.2.1) |
| 05000354/2005006-03 | FIN | Longstanding reliability and unavailability of the SW emergency makeup supply to SACS. (Section 4OA2.b.2.2) |

| | | |
|---|---|---|
| 05000272/2005007-04 | FIN | Component cooling water configuration control deficiency. (Section 4OA2.b.2.3) |
| 05000272, 311/2005007-05 | NCV | Untimely problem resolution for repeat failures of 125VDC battery chargers. (Section 4OA2.c.2.1) |
| 05000311/2005007-06 | NCV | Deficient control area chiller controls. (Section 4OA2.c.2.2) |
| 05000354/2005006-07 | NCV | Repeated challenges to standby service water pumps due to silting and debris in the standby SW strainers. (Section 4OA2.c.2.3) |

## LIST OF DOCUMENTS REVIEWED

Audits, QA Reports, and Self-Assessments

Salem 2005 Problem Identification & Resolution Inspection Preparations, 2/21/2005
Corrective Action Program GAP Analysis Report, 6/11/2004
QA Report 2003-0027 - Corrective Action Management Meeting Effectiveness, 2/5/2003
QA Report 2003-0058 - Quality of Apparent Cause Evaluations, 3/28/2003
QA Report 2003-0070 - Corrective Action Review Board, 6/17/2003
QA Report 2003-0076 - SL2 Evaluation Order 70029590, 4/7/2003
QA Report 2003-0092 - Evaluation of SL2 20133890, 4/21/2003
QA Report 2003-0156 - Transient Combustibles and Live Fire Training, July 3, 2003
QA Report 2003-0176 - Corrective Action and Self-Assessment Program Implementation, 7/15/2003
QA Report 2003-0191 - SL2 Evaluation of SPV Issues, 7/2/2003
QA Report 2003-0211 - Evaluation of SL2 20148028, 7/30/2003
QA Report 2003-0220 - Fire Protection Triennial Assessment, October 6, 2003
QA Report 2003-0226 - Status of Training Improvement Plans, 8/28/2003
QA Report 2003-0283 - Reactivity Management
QA Report 2004-0019 - Self-Assessment of QA Procedures, 1/30/2004
QA Report 2004-0030 - Power Transient SL1 Corrective Actions, 2/8/2004
QA Report 2004-0034 - Self-Assessment Program Implementation, 3/23/2004
QA Report 2004-0039 - Post Maintenance Testing, 3/31/2004
QA Report 2004-0041 - Corrective Action Program Effectiveness, 3/30/2004
QA Report 2004-0088 - Training Effectiveness, Conduct of Training, 6/21/2004
QA Report 2004-0105 - Hope Creek Pre-SSDI Self-Assessment, 6/25/2004
QA Report 2004-0111 - Departmental Performance Indicators, 10/1/2004
QA Report 2004-0147 - Operational Fire Protection Program, October 14, 2004
QA Report 2004-0150 - Closure of Corrective Action Program and Work Management Business Plan Items, 9/21/2004
QA Report 2004-0161 - Corrective Action Program, 10/29/2004
QA Report 2004-0235 - Effectiveness Review for QA Focused Self-Assessment 2004-0102, 12/17/2004

Engineering Programs Self-Assessment Checklist, Fire Protection Program, Salem and Hope Creek Generating Stations
Engineering Self-Assessment, Page 9, 20160891 - SL2, Evaluation Not Created for TS 3.03 Entry
Salem Operations Observation Cards, dated 11/13-17/04 & 1/10-14/05
Salem Operations PAOWF Human Performance and Departmental Cards Analysis, 7/1/04 - 9/30/04 (3rd Quarter)
Salem Operations PAOWF Human Performance and Departmental Cards Analysis, 10/1/04 - 12/31/04 (4th Quarter)
Quality Assessment Focused Self-Assessment 2003-0176, Corrective Action and Self-Assessment Program Implementation, dated 7/15/03
Quality Assessment Monitoring Feedback 2003-0211, Evaluation of SL2 20148028 (Radiation Protection), dated 7/30/03
QA Assessment Monitoring Feedback 2003-0331, Station ALARA Committee Meeting, dated 11/12/03
Quality Assessment Monitoring Feedback 2004-0063, 1R16 Containment Work Activities, dated 4/9/04
QA Assessment Report 2004-0170, Chemistry Rounds and Logs, dated 12/17/04
QA Assessment Report 2004-0167, Flood and Adverse Weather Protection, dated 12/29/04
QA Assessment Report 2004-0084, Process Control Program for Processing and Packaging of Radioactive Wastes, dated 6/22/04
Quality Assessment Report 2004-0034, Self-Assessment Program Implementation, dated 3/23/04
Quality Assessment Report 2003-0283, Reactivity Management, dated 10/21/03
Quality Assessment Report 2004-0041, Corrective Action Program Effectiveness, dated 3/30/04
Quality Assessment Report 2004-0161, Corrective Action Program, dated 10/29/04
Ongoing Self-Assessment Report 80054140 - 0020, Radiation Protection Assessment of Corrective Actions, dated 2/28/03
Radiation Protection Self-Assessment Report 80054140 - 040, Radiation Protection - Instruments, dated 7/11/03
Ongoing Self-Assessment Report 80054140/0060, Chemistry Radiological Work Practices, dated 6/30/2003
Ongoing Self-Assessment Report 80062122/0030, RP Work Practices of Maintenance, dated 2/13/04
Radiation Protection Focused Self-Assessment Report 80066418060, RP Contamination Control/Green Sticker Program, dated 8/29/04
Radiation Protection Self-Assessment Report 800664180100, In Processing Training, dated 1/31/05
Salem Operations Focused Self-Assessment, Reactivity Management, dated 11/22/04
Salem Operations Focused Self-Assessment, Operator Rounds, dated 3/14/04
Salem Operations Focused Self-Assessment, Industrial Safety, dated 12/20/04
Salem Operations Focused Self-Assessment, Procedure Quality and procedure Use & Adherence, dated 4/20/03

Calculations

| | |
|---|---|
| EG-0048, Rev. 0 | Evaluation of SACS System Capabilities Following a Design Basis Earthquake |
| ES-15.004(Q), | Load Flow & Motor Starting Calculation, Rev. 2 |
| ES-15.012, | Bus Transfer, Rev. 2 |
| SC-PB-0002, | Hope Creek 4KV Vital Bus Degraded Grid Voltage Relay Setpoint/Accuracy, Rev. 1 |
| S-C-4KV-JDC-959, | Degraded Vital Bus Undervoltage Setpoint, Rev. 5 |
| SC-4KV001-01, | Salem Unit 1 & 2 4160 Line Feed/Vital Bus Voltage Indication, Rev. 5 |
| S-1-CC-MDC-1817 | Component Cooling Heat Exchanger Operability |

Completed Surveillances

Inservice Testing - 11 Auxiliary Feedwater Pump (S1.OP-ST.AF-0001), dated 2/2/05
Inservice Testing - 23 Auxiliary Feedwater Pump (S2.OP-ST.AF-0003), dated 01/28/05
Inservice Testing - 14 Service Water Pump (S1.OP-ST.SW-0004), dated 12/25/04
Inservice Testing - 23 Service Water Pump (S2.OP-ST.SW-0003), dated 01/25/05
Inservice Testing - 11 Safety Injection Pump (S1.OP-ST.SJ-0001), dated 12/9/04
Inservice Testing - 22 Safety Injection Pump (S2.OP-ST.SJ-0002), dated 1/16/05
1A Diesel Generator Surveillance Test (S1.OP-ST.DG-0001), dated 2/2/05
2C Diesel Generator Surveillance Test (S2.OP-ST.DG-0003), dated 2/17/05
Feedwater System Valves - Cold Shutdown - IST (HC.OP-IS.AE-0102), dated 10/13/04
Feedwater System Valves - IST (HC.OP-IS.AE-0101), dated 1/14/05
Containment Atmosphere Control System Valves - IST (HC.OP-IS.GS-0101), dated 1/7/05
Service Water Screen Wash Subsystem A Valves - IST (HC.OP-IS.EP-0101), dated 3/4/05
Service Water Screen Wash Subsystem B Valves - IST (HC.OP-IS.EP-0102), dated 1/02/05
Emergency Diesel Generator A Operability Test - Monthly (HC.OP-ST.KJ-0001), dated 2/28/05
Emergency Diesel Generator B Operability Test - Monthly (HC.OP-ST.KJ-0002), dated 2/18/05
Emergency Diesel Generator C Operability Test - Monthly (HC.OP-ST.KJ-0003), dated 2/3/05
Emergency Diesel Generator D Operability Test - Monthly (HC.OP-ST.KJ-0004), dated 2/22/05
A SACS Pump - AP210 - IST (HC.OP-IS.EG-0001), dated 2/27/05
B SACS Pump - BP210 - IST (HC.OP-IS.EG-0002), dated 2/18/05
C SACS Pump - CP210 - IST (HC.OP-IS.EG-0003), dated 2/5/05
D SACS Pump - DP210 - IST (HC.OP-IS.EG-0004), dated 1/16/05
A Service Water Pump - AP502 - IST (HC.OP-IS.EA-0001), dated 3/4/05
B Service Water Pump - BP502 - IST (HC.OP-IS.EA-0002), dated 12/19/04
C Service Water Pump - CP502 - IST (HC.OP-IS.EA-0003), dated 2/4/05
D Service Water Pump - AP502 - IST (HC.OP-IS.EA-0004), dated 1/3/05

Design Change Packages (DCPs)

80023523
80030039
80072683
80073762
80074401

Drawings

205231 A 8761 Component Cooling Water P&ID Sheet 1, Rev 64, 6/29/2004
205231 A 8761 Component Cooling Water P&ID Sheet 2, Rev 44, 12/2/1997
205231 A 8761 Component Cooling Water P&ID Sheet 3, Rev 43, 3/25/1997
203000 S 8789-51,Salem No. 1 & No. 2 Units Generators and Main Transformers, One Line Control, Rev. 51
203000-SIMP-1, Salem 500KV- 4KV, Electrical Distribution-Simplified One Line, Rev. 1
203001 A 8789-29, Salem Unit 1, 4160V, Group Buses One Line, Rev. 29
203002 A 8789-34, Salem Unit 1, 4160V, Vital Buses One Line, Rev. 34
203061 A 8789-33, Salem Unit 2, 4160V, Vital Buses One Line, Rev. 33
203062 A 8789-27, Salem Unit 2, 4160V, Group Buses One Line, Rev. 27
Hope Creek Generating Station Service Water (—10-1, Sh. 2), Rev. 36

Evaluations/Analyses

Root Cause Analysis, Salem 500kV Failure/Bus Transfer Event, Rev. 1
Root Cause Analysis, Salem 500kV 1-5 Breaker Failure, Rev. 1
S-C-4KV-EEE-1972, Assessment of Salem Transfer Capability (as a result of 7/29/03 failure)
S-C-4KV-EEE-1795, Establishment of New Lower Voltage Limit for Vital Buses at Salem Stations, Rev. 1

Non-Cited Violations

50-272 & 311/03-03-02
50-272/03-03-03
50-272/03-05-01
50-272/03-05-04
50-272/03-05-07
50-272/03-08-01
50-272/03-08-02
50-272/03-08-03
50-272/03-09-02
50-272/03-09-03
50-272/04-02-02
50-272/04-03-01
50-311/04-03-03
50-311/04-03-07
50-272/04-03-09
50-272/04-03-11
50-272/04-04-01
50-272 & 311/04-04-03
50-272 & 311/04-06-01

Procedures

HC.MD-PM.EA-0002, Rev. 13, Service Water Intake Bay Silt Survey and Silt Removal
HC.OP-AB.COOL-0001, Rev. 5, Station Service Water
HC.OP-AB.COOL-0002, Rev. 0, Safety/Turbine Auxiliaries Cooling System
NC.CA-TM.ZZ-0003(Z), Rev. 2, Root Cause Evaluation Guideline
NC.CA-TM.ZZ-0004(Z), Rev.3, Root Cause Evaluation Template
NC.CA-TM.ZZ-0005(Z), Rev. 5, Apparent Cause Evaluation Guideline
NC.CA-TM.ZZ-0006(Z), Rev. 17, Corrective Action Review Board Process
NC.CA-TM.ZZ-0007(Z), Rev. 0, Effectiveness Review Process
NC.CA-TM.ZZ-0008(Z), Rev. 0, Common Cause Evaluation Guideline
NC.CA-DG.ZZ-0101(Z), Rev. 5, Operational Challenges Desk Guide
NC.LR-AP.ZZ-0054(Q), Rev. 2, Operating Experience (OE) Program
NC.NA-AP.ZZ-0016(Q), Rev. 5, Monitoring the Effectiveness of Maintenance
NC.PF-AP.ZZ-0082(Z), Rev. 9, Review, Prioritization and Approval Process

NC.QA-AP.ZZ-0077(Z), Rev. 1, Self-Assessment Process
NC.QA-AP.ZZ-0002(Q), Rev. 9, QA/NSB Document Review
NC.QA-AP.ZZ-0004(Z), Rev 1, Differing Professional Opinion Resolution
NC.QA-AP.ZZ-0020(Q), Rev 15, QA Inspection Program
NC.QA-AP.ZZ-0021(Q), Rev. 1, QA Processing of Part 21 Notifications
NC.QA-AP.ZZ-0026(Q), Rev. 21, QA Audits
NC.QA-AP.ZZ-0030(Q), Rev. 0, Nuclear Review Board
NC.QA-AP.ZZ-0031(Q), Rev. 11, Onsite Independent Review Program
NC.QA-AP.ZZ-0032(Q), Rev. 5, Independent Inspector Certification Program
NC.QA-AP.ZZ-0034(Q), Rev. 0, QA Performance Based Inspection Program
NC.QA-DG.ZZ-0015(Z), Rev. 8, QA Issue Identification and Escalation
NC.QA-PO.ZZ-0001(Q), Rev. 1, QA Operational Philosophy
NC.QA-PS.ZZ-0001(Q), Rev. 3, QA Standards Matrix
NC.QN-AP.ZZ-0003(Q), Rev. 9, Revisions to the Quality Assurance Program
NC.WM-AP.ZZ-0000(Q), Rev. 10, Notification Process
NC.WM-AP.ZZ-0001 (Q), Rev. 11, Work Management Process
NC.WM-AP.ZZ-0002(Q), Rev. 10, Corrective Action Process
S1.OP-AB-LOOP-0001(Q), Rev. 16, Loss of Off-Site Power
S2.OP-AB.LOOP-0001(Q), Rev. 16, Loss of Off-Site Power
S1.OP-DL.ZZ-0003(Q), Rev. 44, Control Room Log - Modes 1 - 4
S2.OP-DL.ZZ-0003(Q), Rev. 56, Control Room Log - Modes 1 - 4
S1.OP-SO.4KV-0009(Z), Rev. 14, 1CW 4KV Bus Operation
S2.OP-SO.4KV-0009(Z), Rev. 11, 2CW 4KV Bus Operation
S2.MD-PM.AF-0002, Rev. 6, Motor Driven Ingersoll-Rand Auxiliary Feedwater Pump Disassembly, Inspection and Reassembly
S1.OP-SO.SW-0001, Rev. 21, Service Water Pump Operation
S1.OP-AR.ZZ-0002, Rev. 25, Overhead Annunciators Window B
SH.OP-DL.ZZ-0027, Rev. 5, Temporary Reading Log & Log Supplements
SH.OP-AP.ZZ-0103(Q), Rev. 9, Component Configuration Control
SH.OP-AP.ZZ-0108(Q), Rev. 16, Operability Assessment and Equipment Control Program
SH.MD-DG.ZZ-0023, Rev. 3, Scaffold Erection, Modification and Dismantling Desk Top Guide
SH.MD-AP.ZZ-0023, Rev. 6, Scaffold Program
SH.MD-DG.ZZ-0007 (Z), Rev. 10, Maintenance Standards
SC.MD-PM.CC-0001 (Q), Rev. 10, Component Cooling Pump Internal Inspection and Thrust Bearing Replacement

System Health Reports and Trending Data

Hope Creek Fuel Pool Cooling and Cleanup
Hope Creek Main Turbine and Auxiliary Systems
Hope Creek Control Room HVAC System
Hope Creek Control Rod Drive
Hope Creek Emergency Diesel Generators
Hope Creek Service Water (EA/EP), 9/1/04 TO 12/31/04, 4th Quarter 2004
Hope Creek Safety and Turbine Auxiliary Cooling System (STACS) - EG, 9/1/04 to 12/31/04
Salem 1 Auxiliary Feedwater System Health Report, 4th Quarter 2004
Salem 2 Auxiliary Feedwater System Health Report, 4th Quarter 2004

Salem 1 Service Water System, 4th Quarter 2004
Salem 2 Service Water System, 4th Quarter 2004
Salem 1 Safety Injection System, 10/01/04 to 12/31/04, 4th Quarter 2004
Salem 2 Safety Injection System, 10/01/04 to 12/31/04, 4th Quarter 2004
Salem 1 Chemical Volume Control, 4th Quarter 2004
Salem 2 Chemical Volume Control, 4th Quarter 2004
A, B, C, D Service Water Intake Bay Silt Survey Trending Data, 10/4/99 - 1/6/05
Salem 1, Component Cooling System, 4th qtr 2004, 12/31/2004
Salem 2, Component Cooling System, 4th qtr 2004, 12/31/2004
Salem 1 Fire Protection, 3rd Quarter 2004
Salem 2 Fire Protection, 3rd Quarter 2004
Salem 1 Fire Protection, 4th Quarter 2004
Salem 2 Fire Protection, 4th Quarter 2004
Salem 1 4kV System, 4th Quarter 2004
Salem 2 4kV System, 4th Quarter 2004
Hope Creek Fire Protection, 3rd Quarter 2004
Hope Creek Fire Protection, 4th Quarter 2004
Fire Protection Program Health Report, Period January 2004, June 2004

Orders and Evaluations

| | | | | | |
|---|---|---|---|---|---|
| 30041485 | 60037927 | 60047339 | 70022265 | 70031177 | 70035275 |
| 30081483 | 60037998 | 60047739 | 70023083 | 70031258 | 70035290 |
| 30085284 | 60038730 | 60048023 | 70023178 | 70031383 | 70035401 |
| 30087034 | 60038786 | 60048115 | 70026802 | 70031413 | 70035833 |
| 30087318 | 60039114 | 60048470 | 70028106 | 70031659 | 70035939 |
| 30087982 | 60040064 | 60048505 | 70028208 | 70032029 | 70036089 |
| 30097091 | 60040217 | 60048542 | 70028374 | 70032167 | 70036112 |
| 30098912 | 60040428 | 60048543 | 70028618 | 70032409 | 70036161 |
| 30115623 | 60040561 | 60048545 | 70029006 | 70032506 | 70036324 |
| 40008840 | 60041629 | 60048546 | 70029127 | 70032562 | 70036363 |
| 50079049 | 60041857 | 60048547 | 70029285 | 70032825 | 70036365 |
| 50082303 | 60041858 | 60048548 | 70029347 | 70032901 | 70036752 |
| 60011031 | 60041860 | 60048549 | 70029458 | 70033182 | 70036864 |
| 60021746 | 60042218 | 60048550 | 70029591 | 70033197 | 70036969 |
| 60024088 | 60042219 | 60048551 | 70029594 | 70033329 | 70037109 |
| 60024588 | 60042220 | 60048552 | 70029882 | 70033492 | 70037127 |
| 60031896 | 60042286 | 60048553 | 70029887 | 70033539 | 70037183 |
| 60031943 | 60042438 | 60048554 | 70029891 | 70033628 | 70037412 |
| 60032555 | 60042574 | 60048848 | 70029950 | 70033834 | 70037479 |
| 60032556 | 60043979 | 60048965 | 70030002 | 70033930 | 70037484 |
| 60032602 | 60043980 | 60048966 | 70030230 | 70034002 | 70037510 |
| 60032603 | 60045248 | 60049227 | 70030231 | 70034140 | 70037623 |
| 60033270 | 60045249 | 60049764 | 70030270 | 70034737 | 70037721 |
| 60034448 | 60045302 | 60049923 | 70030699 | 70034872 | 70037733 |
| 60035369 | 60046575 | 60050219 | 70031070 | 70034881 | 70038071 |
| 60035510 | 60047317 | 60051353 | 70031155 | 70034963 | 70038091 |

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|---|---|---|---|---|---|
| 70038121 | 70039159 | 70040282 | 70041320 | 70042850 | 80025150 |
| 70038387 | 70039170 | 70040328 | 70041415 | 70042942 | 80040533 |
| 70038524 | 70039231 | 70040561 | 70041544 | 70042988 | 80053229 |
| 70038615 | 70039288 | 70040699 | 70041885 | 70043313 | 80056707 |
| 70038629 | 70039353 | 70040740 | 70041889 | 70043729 | 80064179 |
| 70038638 | 70039456 | 70040813 | 70041902 | 70044011 | 80068351 |
| 70038689 | 70039623 | 70040846 | 70041909 | 70044027 | 80070162 |
| 70038783 | 70039645 | 70040875 | 70042201 | 70044165 | 80074401 |
| 70038854 | 70039907 | 70040926 | 70042251 | 70044199 | 80075390 |
| 70038861 | 70039928 | 70041083 | 70042446 | 70044322 | 80078632 |
| 70038902 | 70040074 | 70041104 | 70042603 | 70044467 | 80079060 |
| 70039073 | 70040192 | 70041180 | 70042621 | 70044768 | 971013150 |
| 70039109 | 70040264 | 70041212 | 70042687 | 70045403 | |

Notifications Reviewed/Written for this Inspection

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|---|---|---|---|---|---|
| 20037582 | 20127342 | 20133910 | 20143070 | 20151760 | 20162554 |
| 20038256 | 20127482 | 20133913 | 20143144 | 20152770 | 20162801 |
| 20058661 | 20127664 | 20133969 | 20144107 | 20153108 | 20163198 |
| 20071232 | 20127791 | 20133970 | 20144403 | 20153410 | 20163339 |
| 20075010 | 20128060 | 20133992 | 20144552 | 20153925 | 20163393 |
| 20075728 | 20128124 | 20134003 | 20144554 | 20153983 | 20163394 |
| 20077752 | 20128140 | 20134077 | 20144707 | 20154543 | 20163396 |
| 20078996 | 20128256 | 20134622 | 20144712 | 20155083 | 20163522 |
| 20079170 | 20128369 | 20134944 | 20145129 | 20156271 | 20163704 |
| 20079562 | 20129057 | 20135446 | 20145133 | 20156362 | 20164070 |
| 20079565 | 20129243 | 20135502 | 20146136 | 20156551 | 20164497 |
| 20082985 | 20129246 | 20135512 | 20146321 | 20156866 | 20164730 |
| 20085848 | 20129312 | 20135513 | 20146656 | 20156974 | 20165852 |
| 20085945 | 20129726 | 20135661 | 20146800 | 20157376 | 20165871 |
| 20085946 | 20129858 | 20135822 | 20146880 | 20157540 | 20166315 |
| 20086171 | 20129967 | 20136006 | 20147066 | 20158261 | 20166529 |
| 20087812 | 20130136 | 20136177 | 20147394 | 20158321 | 20167104 |
| 20090303 | 20130309 | 20136434 | 20147747 | 20158465 | 20167758 |
| 20090944 | 20130775 | 20136602 | 20148028 | 20158632 | 20168094 |
| 20091651 | 20130862 | 20137093 | 20148160 | 20159382 | 20168428 |
| 20095182 | 20131346 | 20137129 | 20149496 | 20160269 | 20168854 |
| 20101701 | 20131588 | 20137354 | 20149641 | 20160842 | 20169114 |
| 20111289 | 20131677 | 20137681 | 20150507 | 20160891 | 20169418 |
| 20111857 | 20131787 | 20138903 | 20150604 | 20160918 | 20169671 |
| 20115009 | 20132950 | 20138938 | 20150887 | 20160931 | 20169733 |
| 20116804 | 20133267 | 20139115 | 20150909 | 20160985 | 20170614 |
| 20124539 | 20133397 | 20139118 | 20151331 | 20161194 | 20170863 |
| 20125291 | 20133597 | 20139130 | 20151332 | 20161377 | 20171132 |
| 20126306 | 20133726 | 20140724 | 20151421 | 20161614 | 20171232 |
| 20126830 | 20133890 | 20141215 | 20151723 | 20161639 | 20171701 |
| 20127255 | 20133904 | 20142575 | 20151724 | 20162366 | 20171756 |

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|---|---|---|---|---|---|
| 20172444 | 20182573 | 20189921 | 20199527 | 20206875 | 20215013 |
| 20172488 | 20182916 | 20189942 | 20199601 | 20206898 | 20215621 |
| 20172576 | 20182927 | 20190529 | 20199758 | 20207005 | 20215657 |
| 20172623 | 20183682 | 20190639 | 20199939 | 20207105 | 20215678 |
| 20172798 | 20183687 | 20191128 | 20200927 | 20207107 | 20215739 |
| 20172875 | 20184393 | 20191172 | 20200938 | 20207271 | 20215776 |
| 20172983 | 20184477 | 20191494 | 20201072 | 20207415 | 20216001 |
| 20172987 | 20184593 | 20191499 | 20201645 | 20208058 | 20216016 |
| 20173622 | 20184629 | 20191519 | 20201671 | 20208470 | 20216070 |
| 20173835 | 20184708 | 20192149 | 20201689 | 20208504 | 20216430 |
| 20174146 | 20184959 | 20192262 | 20201692 | 20208505 | 20216430 |
| 20174354 | 20185039 | 20192275 | 20201701 | 20208506 | 20216455 |
| 20174423 | 20185175 | 20192287 | 20201845 | 20208513 | 20216473 |
| 20175144 | 20185191 | 20192702 | 20201970 | 20208580 | 20216509 |
| 20175150 | 20185302 | 20192703 | 20201994 | 20208892 | 20217015 |
| 20175469 | 20185370 | 20192784 | 20202108 | 20208989 | 20217444 |
| 20175605 | 20185551 | 20192888 | 20202171 | 20209050 | 20217469 |
| 20176214 | 20185568 | 20193201 | 20202226 | 20209101 | 20217645 |
| 20176331 | 20185599 | 20193264 | 20202483 | 20209102 | 20217647 |
| 20176935 | 20185837 | 20193380 | 20202771 | 20209103 | 20217843 |
| 20177014 | 20185911 | 20194799 | 20202888 | 20209289 | 20218297 |
| 20177031 | 20185960 | 20195100 | 20203026 | 20209300 | 20218653 |
| 20177063 | 20185968 | 20195339 | 20203031 | 20209352 | 20218671 |
| 20177444 | 20186003 | 20195340 | 20203116 | 20209363 | 20219003 |
| 20177461 | 20186028 | 20195458 | 20203214 | 20209492 | 20219079 |
| 20177503 | 20186241 | 20195459 | 20203324 | 20209663 | 20219290 |
| 20177624 | 20186359 | 20195472 | 20203525 | 20209735 | 20219527 |
| 20177734 | 20186608 | 20195473 | 20203538 | 20209772 | 20219920 |
| 20178650 | 20186810 | 20195474 | 20203566 | 20209825 | 20219926 |
| 20178662 | 20186985 | 20195723 | 20203664 | 20209894 | 20220141 |
| 20179066 | 20186988 | 20195987 | 20203669 | 20210310 | 20220177 |
| 20180001 | 20187103 | 20196046 | 20203749 | 20210439 | 20220309 |
| 20180082 | 20187261 | 20196070 | 20203766 | 20210676 | 20220839 |
| 20180233 | 20187271 | 20196154 | 20203896 | 20210742 | 20220965 |
| 20180270 | 20187414 | 20196327 | 20203897 | 20210849 | 20221325 |
| 20180381 | 20187588 | 20196637 | 20204120 | 20211263 | 20221348 |
| 20180499 | 20187615 | 20196790 | 20204207 | 20211551 | 20221480 |
| 20180752 | 20187632 | 20197579 | 20204270 | 20211713 | 20221545 |
| 20180763 | 20187692 | 20197796 | 20204359 | 20211810 | 20221821 |
| 20180856 | 20187870 | 20198146 | 20204395 | 20212421 | 20221864 |
| 20181019 | 20187886 | 20199092 | 20204546 | 20212514 | 20221867 |
| 20181022 | 20188571 | 20199193 | 20204952 | 20212648 | 20223109 |
| 20181302 | 20188691 | 20199287 | 20205138 | 20212968 | 20223251 |
| 20181337 | 20188892 | 20199300 | 20205895 | 20213045 | 20223305 |
| 20181784 | 20189073 | 20199332 | 20206335 | 20213564 | 20223395 |
| 20181900 | 20189105 | 20199339 | 20206339 | 20213779 | 20223470 |
| 20182164 | 20189242 | 20199497 | 20206786 | 20214154 | 20223544 |

| | | | | | |
|---|---|---|---|---|---|
| 20223562 | 20226537* | 20226795 | 20227197* | 20227802* | 20228755* |
| 20223623 | 20226538* | 20226813* | 20227198* | 20227822* | 20228756* |
| 20223854 | 20226540* | 20226815* | 20227216* | 20227905* | 20228787* |
| 20223995 | 20226593* | 20226818* | 20227245* | 20227906* | 20228794* |
| 20224131 | 20226594* | 20226827* | 20227248* | 20228036* | 20228851* |
| 20224479 | 20226595* | 20226834* | 20227292* | 20228037* | 20228852* |
| 20224489 | 20226596* | 20226843* | 20227340* | 20228070* | 20228853* |
| 20224549 | 20226598* | 20226844* | 20227342* | 20228101* | 20228854* |
| 20224695 | 20226602* | 20226846* | 20227347* | 20228105* | 20228855* |
| 20225325 | 20226605* | 20226847* | 20227351* | 20228274 | 20228856* |
| 20225588 | 20226617* | 20226848* | 20227352* | 20228379* | 20228858* |
| 20225726 | 20226644* | 20226849* | 20227353* | 20228380* | 20228859* |
| 20225756 | 20226654* | 20226881* | 20227360* | 20228394* | 20228860* |
| 20225895 | 20226676 | 20226912* | 20227363* | 20228486* | 20228871* |
| 20225900 | 20226702* | 20226913* | 20227364* | 20228521* | 20228872* |
| 20226040 | 20226709* | 20226933* | 20227451* | 20228607* | 20228873* |
| 20226265* | 20226720* | 20226951* | 20227489* | 20228609* | 20228874* |
| 20226348 | 20226722* | 20226956* | 20227541* | 20228636* | 20228875* |
| 20226422* | 20226731* | 20226984* | 20227564* | 20228638* | 20228876* |
| 20226423* | 20226756* | 20226985* | 20227626* | 20228725* | 20228877* |
| 20226424* | 20226759* | 20227009* | 20227627* | 20228739* | 20228908* |
| 20226429* | 20226760* | 20227046* | 20227644* | 20228740* | 20228922* |
| 20226445* | 20226766* | 20227062* | 20227705* | 20228751* | 20228938* |
| 20226453* | 20226767* | 20227063* | 20227722* | 20228752* | 20228939* |
| 20226454* | 20226768* | 20227182* | 20227725* | 20228753* | 20229015* |
| 20226512* | 20226786* | 20227183* | 20227726 | 20228754* | |
| 20226536* | 20226789* | | | | |

* indicates Notifications written as a result of the team's inspection activities

Miscellaneous

NRC Information Notice 2002-08: Pump shaft damage due to excessive hardness of shaft sleeve generator tubes
NRC Information Notice 2002-12: Submerged Safety-Related Electrical Cables
NRC Information Notice 2003-02: Recent experience with reactor coolant system leakage and boric acid corrosion
NRC Information Notice 2004-07: Plugging of safety injection pump lubrication oil coolers with lakeweed
NRC Information Notice 2004-01: Auxiliary Feedwater Pump Recirculation Line Orifice Fouling
NRC Information Notice 1997-40, Potential Nitrogen Accumulation Resulting From Backleakage From Safety Injection Tanks, dated 6/26/97
Hope Creek Expert Panel Meeting Minutes (HCEP 05-001), dated 2/28/05
Temporary Modification Summary Salem Unit 1, dated 8/23/04
Salem CROD Status Log
Salem Unit 1 and 2 Forced Outage Plan
Hope Creek Top Risk Significant Systems and Top Ten Operator Actions

Salem Top Risk Significant Systems and Top Ten Operator Actions
PSEG Nuclear, LLC, Corrective Action Program Performance Indicators, December 2004
PSEG Metrics for Improving the Work Environment, Quarterly Report, 1/31/2005
Salem Mrule (a)(1) Goals With Outstanding Corrective Actions Corrective Action Status, 1/7/05
Hope Creek Maintenance Rule (a)(1) List
Replace 1EAFE-2218B & 1EAFIT-2218B With Panametrics DF868 Ultrasonic Flowmeter (TM 03-032), Rev. 2
Salem Unit 1 Control Room Narrative Log, dated 11/1-30/04 & 12/23/04 - 2/15/05
Salem Operability Determination 04-009; 11,12,21 & 22 Nuclear Service Water Headers High Operating Pressure, Rev. 5
Risk-Informed Inspection Notebook For Salem Generating Station, Rev. 1
Risk-Informed Inspection Notebook For Hope Creek Generating Station, Rev. 1
Employee Concerns Program Report 2003-2004

## LIST OF ACRONYMS USED

| | |
|---|---|
| AFW | Auxiliary Feedwater |
| CAP | Corrective Action Program |
| CAPR | Corrective Action to Prevent Recurrence |
| CARB | Corrective Action Review Board |
| CCW | Component Cooling Water |
| CDF | Core Damage Frequency |
| CDP | Core Damage Probability |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| CRDM | Control Rod Drive Mechanism |
| CROD | Condition Resolution Operability Determination |
| DC | Direct Current |
| DCP | Design Change Package |
| ECCS | Emergency Core Cooling System |
| EDG | Emergency Diesel Generator |
| EMIS | Equipment Malfunction Information System |
| HCGS | Hope Creek Generating Station |
| IMC | Inspection Manual Chapter |
| IPE | Individual Plant Examination |
| IST | Inservice Test |
| LCO | Limiting Condition for Operation |
| LERF | Large Early Release Frequency |
| LOSW | Loss of Service Water |
| MOV | Motor-Operated valve |
| NCV | Non-Cited Violation |
| NOTF | Notification (PSEG input into their CAP) |
| OE | Operating Experience |
| OTSB | Open Torque Switch Bypass |
| PHPC | Plant Health Prioritization Committee |
| PI&R | Problem Identification and Resolution |

| | |
|---|---|
| PRA | Probabilistic Risk Assessment |
| PSEG | Public Service Enterprise Group, LLC |
| PSID | Pounds per Square Inch Differential |
| QA | Quality Assessment |
| RCIC | Reactor Core Isolation Cooling |
| RHR | Residual Heat Removal |
| ROP | Reactor Oversight Process |
| SACS | Safety Auxiliaries Cooling System |
| SCWE | Safety Conscious Work Environment |
| SDP | Significant Determination Process |
| SFP | Spent Fuel Pool |
| SI | Safety Injection |
| SL | Significance Level |
| SPAR | Standardized Plant Analysis Risk |
| SRA | Senior Reactor Analyst |
| SSW | Station Service Water |
| ST | Surveillance Test |
| SW | Service Water |
| TS | Technical Specification |
| UFSAR | Updated Final Safety Analysis Report |
| URI | Unresolved Item |
| VDC | Volts Direct Current |