

June 21, 2001

Mr. Harold W. Keiser  
Chief Nuclear Officer and President  
PSEG Nuclear LLC - X04  
P. O. Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: SALEM GENERATING STATION NRC INSPECTION REPORT 50-272/01-06,  
50-311/01-06

Dear Mr. Keiser:

On May 19, 2001, the NRC completed an inspection of your Salem 1 & 2 reactor facilities. The enclosed report presents the results of that inspection. The preliminary findings were presented to PSEG Nuclear management led by Mr. David Garchow in an exit meeting on May 29, 2001.

This inspection examined activities conducted under your license as they relate to the identification and resolution of problems, and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The inspectors identified one issue of very low safety significance (Green) involving the failure to implement appropriate corrective actions for a degraded moisture barrier. This issue was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because the issue has been entered into your corrective action program, the NRC is treating this issue as a non-cited violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny this non-cited violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at the Salem facility.

Mr. Harold W. Keiser

2

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/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Glenn W. Meyer, Chief,  
Projects Branch 3  
Division of Reactor Projects

Enclosure: Inspection Report 50-272/01-06, 50-311/01-06

Attachment: Supplemental Information

cc w/encl:

E. Simpson, Senior Vice President and Chief Administrative Officer

M. Bezilla, Vice President - Technical Support

D. Garchow, Vice President - Operations

G. Salamon, Manager - Licensing

R. Kankus, Joint Owner Affairs

J. J. Keenan, Esquire

Consumer Advocate, Office of Consumer Advocate

F. Pompper, Chief of Police and Emergency Management Coordinator

M. Wetterhahn, Esquire

State of New Jersey

State of Delaware

Mr. Harold W. Keiser

3

Distribution w/encl:  
Region I Docket Room (with concurrences)  
R. Lorson, DRP - NRC Resident Inspector  
H. Miller, RA  
J. Wiggins, DRA  
G. Meyer, DRP  
R. Barkley, DRP  
T. Haverkamp, DRP  
L. Privity, DRS  
R. Jenkins, OEDO  
E. Adensam, NRR  
R. Fretz, PM, NRR  
R. Ennis, Backup PM, NRR

DOCUMENT NAME: C:\Program Files\Adobe\Acrobat 4.0\PDF Output\Salem2001-06.wpd

After declaring this document "An Official Agency Record" it **will** be released to the Public.

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RI:DRP	RI:DRP					
NAME	Lorson /GWM for/	Meyer/GWM/					
DATE	06/14/01	06/14/01					

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 50-272, 50-311  
License Nos: DPR-70, DPR-75

Report No: 50-272/01-06, 50-311/01-06

Licensee: PSEG Nuclear LLC

Facility: Salem Nuclear Generating Station, Units 1 & 2

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

Dates: April 1 - May 19, 2001

Inspectors: Raymond K. Lorson, Senior Resident Inspector  
F. Jeff Laughlin, Resident Inspector  
Richard S. Barkley, Senior Project Engineer  
Jason C. Jang, Senior Health Physicist  
Joseph T. Furia, Senior Health Physicist

Approved By: Glenn W. Meyer, Chief,  
Projects Branch 3  
Division of Reactor Projects

## Summary of Findings

IR 05000272-01-06, IR 05000311-01-06, on 4/1 - 5/19/01 Public Service Electric Gas Nuclear LLC, Units 1 and 2. Refueling and Outage Activities.

The inspection was performed by resident inspectors, two regional radiation specialists, and a regional projects inspector, and identified one green finding which was treated as a non-cited violation. The significance of findings is indicated by their color (Green, White, Yellow, or Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "no color" or by the severity level of the applicable violation.

### A. Inspector Identified Findings

#### **Cornerstone: Barrier Systems**

- (Green) PSEG Nuclear did not repair defects that challenged the integrity of the moisture barrier enclosing the containment insulation assembly and liner, and did not evaluate this aspect of the defects. These defects provided a path for moisture to reach inaccessible and uninspected areas of the containment liner.

This finding was evaluated using the significance determination process and found to be of very low significance because the containment integrity was not immediately compromised and adverse effects would be long term. The failure to promptly correct this condition adverse to quality was a non-cited violation of 10 CFR 50 Appendix B, Criterion XVI. (Section R20)

### B. Licensee Identified Findings

Two violations of very low significance which were identified by PSEG Nuclear were reviewed by the inspector. Corrective actions appeared reasonable. These violations are listed in section 40A7 of this report.

## TABLE OF CONTENTS

1.	REACTOR SAFETY	1
	R04 Equipment Alignment	1
	R05 Fire Protection	1
	R13 Maintenance Risk Assessments and Emergent Work Control	2
	R14 Personnel Performance During Nonroutine Plant Evolutions	2
	R15 Operability Evaluations	3
	R19 Post Maintenance Testing	4
	R20 Refueling and Outage Activities	4
	R22 Surveillance Testing	7
2.	RADIATION SAFETY	8
	PS3 Radiological Environmental Monitoring	8
	.1 Radiological Environmental Monitoring Program	8
	.2 Radioactive Material Control Program	9
	OS1 Access Control	10
	OS2 ALARA Planning and Controls	10
	OS3 Radiation Monitoring Instrumentation	11
4.	OTHER ACTIVITIES [OA]	11
	OA3 Event Follow-Up	11
	OA6 Management Meetings	12
	Exit Meeting Summary	12
	OA7 Licensee Identified Violations	12
	SUPPLEMENTAL INFORMATION	13
	a. Key Points of Contact	13
	b. List of Items Opened, Closed, and Discussed	13
	c. List of Acronyms	14

## Report Details

### **SUMMARY OF PLANT STATUS**

Unit 1 began the period at approximately 96% power while operating in the end of cycle coastdown. On April 4, 2001, the operators reduced reactor power to approximately 45% in response to an unexpected trip of the 1B main feedwater pump (Section R14). The operators shut down Unit 1 on April 6, 2001, to commence refueling outage 14 (1R14). The operators performed a reactor start-up on May 17, 2001, and connected the main generator to the electrical grid on May 19, 2001.

Unit 2 operated at approximately 100% power for the duration of the inspection period.

#### **1. REACTOR SAFETY (Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity)**

##### R04 Equipment Alignment

###### a. Inspection Scope

On April 24, the inspector performed a partial system walkdown of the 1B and 1C emergency diesel generators (EDGs) while the 1A EDG was removed from service for planned maintenance. That day the inspector also walked down the #1 service water (SW) bay and control house to verify the functionality of the 11 SW header while the 12 SW header was out of service for maintenance. Lastly, on May 8 the inspector walked down the 21 and 23 auxiliary feedwater (AFW) pumps during the 22 AFW pump outage. During these walkdowns the inspector verified that the redundant components were properly aligned to perform their intended safety functions, appropriately protected by administrative controls, and in good material condition. The inspector identified minor deficiencies to operations personnel who either corrected them or ensured they were properly documented.

###### b. Findings

No findings of significance were identified.

##### R05 Fire Protection

###### a. Inspection Scope

The inspector performed fire protection system walkdowns of the Salem Unit 1 primary containment building, and the Unit 1 electrical and mechanical penetration areas. The inspector reviewed the material condition and operational status of fire detection and suppression equipment, and also the control of transient combustible materials and ignition sources. In addition, the inspector evaluated the condition of fire barriers, and penetration seals.

b. Findings

No findings of significance were identified.

R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed through direct observations, document reviews (i.e. operating logs, and notifications 20065582 and 20065442) and interviews of operations, maintenance and work control personnel PSEG Nuclear's response to two emergent maintenance activities. The maintenance activities involved the repair of service water leaks from the 11 and 21 containment fan cooler units (CFCUs). The inspectors reviewed these activities to evaluate their risk impact, and also to determine whether the leaks were promptly identified and corrected. Additionally, the inspectors reviewed whether the activities were performed in accordance with Technical Specification (TS) and PSEG Nuclear work control requirements.

b. Findings

No findings of significance were identified.

R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

The inspector reviewed PSEG Nuclear's response to an event involving the unexpected trip of the 11 steam generator feedwater pump (SGFP) on April 4, 2001. The reactor operator stabilized the plant and reduced power to approximately 45% following the 11 SGFP trip. The SGFP trip was caused by a momentary electrical transient on the 12 essential controls inverter. The electrical transient was initiated by the shutting of the 12MAC18 circuit breaker following a planned maintenance activity. The inspector reviewed the risk associated with this event and determined that it was of very low significance and bounded by the risk associated with a reactor trip event.

The inspector reviewed the applicable operating logs, selected plant data, alarm response procedures for responding to SGFP and essential inverter problems, and also the condensate system abnormal operating procedure to determine whether the operators' response was appropriate and consistent with applicable operating procedures. The inspector also reviewed the transient assessment response plan (TARP) report that was developed for this event to assess the adequacy of PSEG Nuclear's immediate corrective actions and planned follow-up actions to prevent recurrence of this type of event.

b. Findings

No findings of significance were identified.



## R15 Operability Evaluations

### a. Inspection Scope

The inspectors reviewed PSEG Nuclear's operability determination and follow-up corrective actions for an approximate 4-5 gpm packing leak from the 22 AFW pump. The leak was identified on May 9, 2001, during post-maintenance testing (PMT) as discussed in Section R19. The inspectors interviewed personnel, and reviewed several documents including: the Salem Updated Final Safety Analysis Report (UFSAR) and TSs, vendor information, operations logs, pump performance data, and notification 20065514 to determine whether PSEG Nuclear had an appropriate basis for declaring the pump operable following completion of the PMT.

### b. Findings

The inspectors interviewed the control room supervisor (CRS) and the operations superintendent (OS) on May 9, 2001, who indicated that the pump was considered to be operable since it met the surveillance test requirements during the PMT. The inspectors also interviewed the system engineer (SE) tasked to investigate the packing leak who indicated that the pump was considered to be operable. However, the SE did not provide any specific technical information related to the available pump flow margin to substantiate this operability determination. Therefore, the inspectors interviewed additional operations and engineering personnel and were subsequently informed that the pump had adequate excess capacity to meet the design basis flow requirements with the existing packing leakage.

The operability assessments did not address other concerns relevant to the degraded pump condition, such as the potential for moisture introduction into the inboard pump bearing lubricating oil reservoir. The inspector interviewed the mechanical component engineering supervisor who indicated that the inboard bearing lubricating oil reservoir had been sampled and found to be free of water contamination. Additionally, the mechanical component engineering supervisor provided vendor technical documentation which illustrated that the packing leak was on the suction side of the pump and would not impact the pump performance. The inspectors noted that the initial operability assessments were based on incorrect information relative to the location of the pump leak.

On May 11 a maintenance technician improperly adjusted the pump packing without having either a work order or permission from operations personnel. The technician informed his supervisor of his actions, who then informed the control room. Operations personnel promptly declared the 22 AFW pump inoperable and maintenance technicians properly adjusted the pump packing using approved work procedures. The inspectors concluded that the improper packing adjustment was of very low risk significance due to the short duration of pump unavailability time (i.e. less than one day) attributed to this maintenance error.

Technical Specification 6.8.1, requires that written procedures shall be established, implemented and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33 requires that procedures be developed

to conduct maintenance on safety-related systems. PSEG Nuclear procedure NC.NA-AP.ZZ-0009(Q), "Work Management Program," requires that individuals perform work in accordance with appropriate work documents. On May 11, 2001, a plant worker adjusted the packing on the 22 AFW pump without having an approved work document. This is being treated as a licensee identified, non-cited violation and is documented in Section 4OA7.

## R19 Post Maintenance Testing

### a. Inspection Scope

The inspector reviewed design change package (DCP) 80008505 and work orders 60009924 and 30001172 associated with the May 8-9 planned maintenance on the 22 AFW pump. The inspector also reviewed the PMT data documented in operating procedure S2.OP-ST.AF-0002(Q), "Inservice Testing 22 Auxiliary Feedwater Pump," and walked down the AFW pump area at the conclusion of the maintenance activities to verify pump operability.

The inspector observed that the pump developed an approximate four to five gallon per minute (gpm) packing leak during the PMT and noted that PSEG Nuclear initiated notification 20065514 to address this degraded pump condition. The inspector reviewed PSEG Nuclear's operability determination and follow-up actions for the 22 AFW pump packing leak as discussed in Section R15.

### b. Findings

No findings of significance were identified.

## R20 Refueling and Outage Activities

### a. Inspection Scope

The inspectors reviewed selected activities prior to and during refueling outage 14 (1R14) to confirm that PSEG Nuclear appropriately considered risk in the scheduling and implementation of 1R14 and to ensure that license and TS requirements were met. Additionally, the inspectors reviewed evolutions that could impact the performance of safety-related equipment and verified that corrective actions for identified deficiencies were appropriate. Some of the activities reviewed included:

- Reviewed the pre-outage schedule to confirm that activities were scheduled with an appropriate emphasis on risk and reviewed on-going activities to assess the risk impact of emergent work and schedule deviations.
- Reviewed the cooldown logs and plant data to confirm that the cooldown rates met the applicable TS requirements.
- Reviewed the oxygenation and clean-up of the RCS system (i.e. crud burst).
- Observed the control of "Mid-Loop" operations to ensure PSEG Nuclear commitments to NRC Generic Letter 88-07 were met for activities involving the control and monitoring of reactor vessel level, shutdown cooling system and containment integrity.

- Performed several containment walkdowns during the outage to review the control of outage activities. Also, a containment walkdown was performed prior to the plant heat-up to ensure that work activities were complete, systems were restored and to ensure that the containment was free of debris.
- Observed fuel handling activities (defueling and refueling) inside the containment and in the spent fuel pool (SFP) to ensure that TS requirements (including containment integrity) were met.
- Verified the RHR (shutdown cooling) and SFP cooling line-ups throughout the outage and reviewed flowpaths, operating equipment and monitored temperature readings.
- Observed the reactor heat-up, start-up from 1R14 and low power physics testing to ensure that procedures were implemented and that TS required mode change requirements were met.
- Observed selected maintenance activities including: RH-V-70 check valve maintenance, 1B EDG generator brush replacement activities and web deflection readings, 1SJ68 motor-operated valve testing, and rod testing and rod position indication calibrations to ensure that work activities were scheduled and performed per PSEG Nuclear work control procedures.
- Reviewed PSEG Nuclear's implementation of the corrective action program. Specifically, the inspectors reviewed PSEG Nuclear's response to material deficiencies that were noted with four containment electrical penetrations and the emergency lighting in the service water accumulator enclosure. Engineering personnel later confirmed that the concerns with the electrical penetrations were previously identified and in the process of being corrected; the deficiencies with the emergency lighting were later entered into PSEG Nuclear's corrective action system and confirmed to involve personnel safety equipment versus lighting necessary to meet 10 CFR 50 Appendix R requirements. Also, the inspectors reviewed the impact of the following notifications on the operability of safety-related equipment:

-20062961 (1B EDG bus bars not bolted)

-20062855 (verify proper operation of the 1RH29 valve)

-20062921 (1R14 fuel leakers and top nozzle assembly problems)

-20062697 (1PR25 failed its "as found" leak rate test)

-20062886 (snubber test failure)

b. Findings

PSEG Nuclear did not repair defects that challenged the integrity of the moisture barrier enclosing the containment insulation assembly and liner, and did not evaluate this aspect of the defects. These defects provided an access path for moisture to reach inaccessible and uninspected areas of the containment liner. This finding was evaluated using the Significance Determination Process and found to be of very low significance, because the containment integrity was not immediately compromised and the adverse effects would be long term. The failure to promptly correct this condition adverse to quality was a non-cited violation of 10 CFR 50 Appendix B, Criterion XVI.

During a tour of the 78' elevation in the primary containment, the inspector observed that numerous (i.e. over one hundred) fastening materials (i.e. nuts, studs and washers) were missing from the stainless steel flashing material installed over the containment liner insulation. The containment insulation assembly, as described in PSEG Nuclear Design Specification 72-6354, consisted of several components including:

- Thermal insulation material installed adjacent to the containment liner to limit the temperature increase of the containment liner during certain postulated events.
- A vapor barrier installed external and adjacent to the thermal insulation material.
- A stainless steel housing installed adjacent to the vapor barrier to support the insulation assembly and to prevent moisture intrusion into the enclosed areas.

The fastening materials were installed to secure the stainless steel flashing material and also to seal the stud access openings in the flashing and vapor barriers to prevent the introduction of moisture into the insulation assembly.

The inspector interviewed design engineering personnel and reviewed PSEG Nuclear calculation 6S1-2047 to determine how long the missing fastener condition described above had existed and also to evaluate PSEG Nuclear's planned and completed corrective actions. Calculation 6S1-2047 indicated that the condition was identified during a containment walkdown in October 1999. The engineers indicated that the missing fasteners had failed due to corrosion caused by service water leaks (similar to the two service water leaks that occurred during this report period as discussed in Section R13) inside the primary containment. Based on the results of Calculation 6S1-2047, PSEG Nuclear determined that the remaining fastening materials had sufficient strength to support the insulation assembly and decided not to repair or replace the missing fasteners. The inspector noted that the moisture barrier function provided by the fastening materials was not considered in this evaluation.

PSEG Nuclear's decision not to restore the insulation assembly moisture barrier could result in the introduction of moisture into the areas enclosed by the insulation assembly and lead to degradation of the containment liner. Additionally, PSEG Nuclear considered the section of the containment liner covered by the insulation assembly to be inaccessible and was not performing containment liner inspections in this area as

documented in the Containment Inservice Inspection Program Bases document. This document indicated that the ASME Code, Section XI, IWE-1220(b) commentary allowed insulated areas to be considered inaccessible for inspection if sealed to prevent the intrusion of moisture against the covered containment surfaces.

The inspector concluded that PSEG Nuclear's decision not to repair the insulation assembly moisture barrier could have a credible impact on safety since it could result in degradation of the containment liner in inaccessible and uninspected areas. The inspector reviewed the Phase 1 Significance Determination Process worksheet and determined that this issue was of very low safety significance since the finding represented a long term liner degradation issue and did not result in a actual open pathway in the containment. The containment integrity had been demonstrated during the leak testing performed in 1R14.

10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," requires that conditions adverse to quality be promptly corrected. In December 2000 PSEG Nuclear decided not to correct deficiencies that affected the integrity of the moisture barrier that prevented moisture from reaching inaccessible areas of the containment liner. This is a violation of 10 CFR 50 Appendix B, Criterion XVI. This violation is being treated as a non-cited violation (NCV) in accordance with Section VI.A.1 of the NRC Enforcement Policy since the finding was of very low significance and was entered into the PSEG Nuclear corrective action program (notification 20064417). **NCV 50-272/01-06-001**

## R22 Surveillance Testing

### a. Inspection Scope

The inspectors observed portions of and reviewed the results of the following surveillance tests. They verified that the tests were properly controlled and that test results were properly documented and met the appropriate TS acceptance criteria. They also discussed test results with operations and engineering personnel.

- Local leak rate testing of several containment radiation air sampling system air-operated containment isolation valves
- 11 Containment Spray Pump Full Flow Testing (S1.OP-ST.CS-0005(Q))
- 1B EDG Monthly Surveillance Testing (S1.OP-ST.DG-0002(Q))
- Reactor Containment Building Integrated Leak Rate Test (S1.RA-IS.ZZ-0013(Q))

### b. Findings

No findings of significance were identified.

## 2. RADIATION SAFETY

### Public Radiation Safety [PS]

#### PS3 Radiological Environmental Monitoring

##### .1 Radiological Environmental Monitoring Program

###### a. Inspection Scope (71122.03)

The inspector reviewed the following documents to evaluate the effectiveness of the Radiological Environmental Monitoring Program (REMP) at the PSEG Maplewood Testing Services Laboratory, Maplewood, NJ, and at the Salem/Hope Creek site. The requirements of the REMP are specified in the Technical Specifications/Offsite Dose Calculation Manual (TS/ODCM).

#### Maplewood Testing Services Laboratory

- 1999 Annual REMP Report and 2000 Draft Report;
- analytical results for 2001 REMP samples;
- most recent calibration results for all TS/ODCM air samplers;
- calibration results for gamma, alpha/beta, and tritium measurement instruments;
- Maplewood Testing Services Laboratory Quality Assurance Manual;
- quality control program;
- 1999, 2000, and 2001 gamma, alpha/beta, and tritium quality control charts;
- interlaboratory and intralaboratory comparisons;
- environmental thermoluminescent dosimeters (TLDs) program;
- Land Use Census procedure and the 2000 results; and
- associated sampling and analytical REMP procedures.

#### Salem/Hope Creek Site

- most recent Salem ODCM (Revision 14, December 12, 2000) and technical justifications for ODCM changes, including sampling media and locations;
- most recent calibration results of the meteorological monitoring instruments (November 2000 and February 2001) for wind direction, wind speed, and temperature;
- 1998, 1999, and 2000 meteorological monitoring data recovery statistics;
- meteorological monitoring program self-assessment report (Report Number NRP-01-007, February 16, 2001)
- QA Assessment Reports for the REMP/ODCM implementation (Report Numbers 2000-0106, 2000-0393, and 2001-0073)

The inspector also toured and observed the following activities to evaluate the effectiveness of the licensee's REMP.

- observation for the operability of meteorological monitoring instruments at the tower and the control room;
- observation of analytical laboratory activities, PSEG Maplewood Testing Services Laboratory;
- observation for air iodine/particulate sampling techniques; and
- walk-down for determining whether all air samplers, milk farms, and 25%TLDs were located as described in the ODCM (including control and indicator stations) and for determining the equipment material condition.

b. Findings

No findings of significance were identified.

.2 Radioactive Material Control Program

a. Inspection Scope (71122.03)

The inspector reviewed the following documents to ensure that PSEG Nuclear met the requirements specified in their program for the unrestricted release of material from the Radiologically Controlled Area (RCA):

- most recent calibration results for the radiation monitoring instrumentation (small articles monitor, SAM-9), including the (a) alarm setting, (b) response to the alarm, and (c) the sensitivity;
- criteria for the survey and release of potentially contaminated material using a gamma spectroscopy (calibrations efficiency for bulk sample analyses);
- methods used for control, survey, and release from the RCA; and
- associated procedures and records to verify for the lower limits of detection for bulk sample analyses.

The review was against criteria contained in 10CFR20, NRC Circular 81-07, NRC Information Notice 85-92, NUREG/CR-5569, Health Position Data Base (Positions 221 and 250), and PSEG Nuclear's procedures.

The following activities were observed for the effectiveness of the material release program:

- observations for the use of SAM-9 at RCA access points; and
- testing for the alarm setpoint using a radioactive source.

b. Findings

No findings of significance were identified.

**Occupation Radiation Safety [OS]**

OS1 Access Control (7112101)

a. Inspection Scope

The inspector reviewed the access control program by examining the controls established for exposure significant areas, including postings, markings, control of access, dosimetry, surveys and alarm set points. Controls reviewed included: key control for locked high radiation areas; use of radiation work permits to control access to radiologically significant areas; and, pre-job radiological briefings. Areas examined were determined by the work being performed in support of the Unit 1 refueling outage, and included: steam generator work (opening of primary and secondary manways, entry into the steam generator bowls, nozzle dam installation, and eddy current testing of generator tubes); core barrel lift; in-service inspection of vessel head penetrations; and, inside vessel visual inspection (IVVI). Observation of work activities occurred during both day and night shifts. A number of temporary high and locked high radiation areas were established in support of refueling outage activities, especially inside the containment bioshield. The controls implemented were compared to those required under plant technical specifications (TS 6.12 and 10 CFR 20, Subpart G) for control of access to high and locked high radiation areas.

b. Findings

No findings of significance were identified.

OS2 ALARA Planning and Controls

a. Inspection Scope

The inspector reviewed work performance during the refueling outage at Unit 1 (1R14). Areas reviewed included a review of the use of low dose waiting areas; review of on-job supervision provided to workers; and, a review of individual exposures from selected work groups. An evaluation of engineering controls utilized to achieve dose reductions and analysis of source term reduction plans were also conducted.

The inspector reviewed dose projections made in support of the refueling outage, compared exposures to date with dose projections, compared actual dose rates in significant work areas with estimated dose rates used to calculate dose projections, and reviewed job guides written in support of its ALARA program, to determine compliance with the requirements contained in 10 CFR 20.1101(b). Through the first two weeks of 1R14, total occupational exposures tracked closely with pre-outage projections, while work scope and person-hours worked in the RCA also tracked closely with projected values.



The inspector reviewed the planned crud burst on shutdown, specifically corrective actions taken based on previous problems in this area during the 1R13 outage (documented in NRC Inspection Report No. 05000272/99-08) and the 2R11 outage (documented in NRC Inspection Report No. 05000311/2000-009). Significant radiation dose rate reductions were documented between those found during 1R13 and 1R14. Total exposure for 1R13 was 190 person-rem, while the outage goal during 1R14 is set at less than 125 person-rem.

The inspector reviewed the installation of selected shielding packages inside the bioshield area of the containment. Selected shielding packages were examined for installation, documentation and dose rate reductions. The inspector also attended a number of pre-job briefings and conducted direct observations of work activities (see paragraph 2OS1 above) to review ALARA initiatives being implemented.

b. Findings

No findings of significance were identified.

OS3 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspector reviewed field instrumentation utilized by health physics technicians and plant workers to measure radioactivity, including portable field survey instruments, friskers, portal monitors and small article monitors. The inspector reviewed instruments observed during the refueling outage, specifically verification of proper function and certification of appropriate source checks for these instruments which are utilized to ensure that occupational exposures are maintained in accordance with 10 CFR 20.1201.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES [OA]**

OA3 Event Follow-Up

- .1 (Closed) LER 05000311/2000-002-00: Engineered Safety Feature Actuation due to 2R11A "Containment Particulate Monitor" Alarm. This LER described an event involving a containment ventilation isolation signal that was generated due to radon products. This event was of minor significance and is closed.

OA6 Management Meetings

a. Exit Meeting Summary

On May 29, 2001, the inspectors presented their overall findings to members of PSEG Nuclear management led by Mr. David Garchow. PSEG Nuclear management acknowledged the findings presented and did not contest any of the inspectors' conclusions. PSEG Nuclear management did not indicate that any of the material discussed at the exit meeting was considered to be proprietary information.

On April 4, 2001, Commissioner Dicus, and the NRC Region I Administrator Hubert Miller toured the Salem Station and met with PSEG Nuclear management. During the meeting PSEG Nuclear performance and generic nuclear industry topics were discussed.

OA7 Licensee Identified Violations: The following violations of very low significance were identified by PSEG Nuclear and are violations of NRC requirements which met the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as Non-Cited Violations (NCV).

**NCV 50-272/01-06-02**: 10 CFR 50.65 (a)(4) requires that "before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed activities." On April 20, 2001, PSEG Nuclear did not properly evaluate the risk associated with the removal of the 1C 125 volt battery from service to conduct a planned maintenance activity. This is being treated as a non-cited violation.

**NCV 50-311/01-06-03**: Technical Specification 6.8.1, requires "that written procedures shall be established, implemented and maintained covering the activities recommended in Appendix "A" of Regulatory Guide 1.33. Regulatory Guide 1.33. requires that procedures be developed to conduct maintenance on safety-related systems. PSEG Nuclear procedure NC.NA-AP.ZZ-0009(Q), "Work Management Program," requires that individuals perform work in accordance with appropriate work documents. On May 11, 2001, a plant worker adjusted the packing on the 22 AFW pump without having the approved work documents. This is being treated as a non-cited violation and is discussed further in Section R15.

**ATTACHMENT 1****SUPPLEMENTAL INFORMATION**a. Key Points of Contact

L. Aldrich	Chemistry Superintendent
T. Cellmer	Radiation Protection Manager
J. D'Souza	Chemistry Engineer
K. Davidson	Operations Manager
D. Garchow	Vice-President - Operations
R. Gary	Radiation Protection Superintendent
S. Harvey	Chemistry Manager
M. Hassler	Radiation Protection Operations Superintendent - Salem
J. Nagle	Licensing Supervisor
T. Neufang	ALARA Supervisor
K. O'Hare	ALARA Superintendent
R. Yewdall	Radiation Protection Engineer

b. List of Items Opened, Closed, and DiscussedOpened/Closed

50-272/01-06-01	NCV	Failure to implement appropriate corrective actions for a degraded moisture barrier. (Section R20)
50-272/01-06-02	NCV	Failure to properly assess the risk associated with the removal of the 1C 125 volt battery from service to conduct a planned maintenance activity. (Section OA7)
50-311/01-06-03	NCV	Worker adjusted the packing on the 22 AFW pump without having an approved work document. (Section OA7)

Closed

05000311/2000-002-00	LER	Engineered Safety Feature Actuation due to 2R11A "Containment Particulate Monitor" Alarm (Section OA6)
----------------------	-----	--

c. List of Acronyms

AFW	Auxiliary Feedwater
ALARA	As Low As Is Reasonably Achievable
CFCUs	Containment Fan Cooler Units
CFR	Code Of Federal Regulations
CRS	Control Room Supervisor
DCP	Design Change Package
EDGs	Emergency Diesel Generators
gpm	Gallon Per Minute
IVVI	Inside Vessel Visual Inspection
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OS	Operations Superintendent
PARS	Publicly Available Records
PMT	Post-maintenance Testing
PSEG	Public Service Electric Gas
QA	Quality Assurance
RCA	Radiologically Controlled Area
REMP	Radiological Environmental Monitoring Program
SAM	Small Articles Monitor
SDP	Significance Determination Process
SE	System Engineer
SGFP	Steam Generator Feedwater Pump
SW	Service Water
TARP	Transient Assessment Response Plan
TLDs	Thermoluminescent Dosimeters
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report