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Licensee: Public Service Electric and Gas Company

Facility: Salem Nuclear Generating Station, Units 1 & 2

Location: P.O. Box 236
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EXECUTIVE SUMMARY

Salem Nuclear Generating Station
NRC Inspection Report 50-272/97-07, 50-311/97-07

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection; in addition, it included the results of announced inspections by regional security and radiation protection inspectors.

Operations

In general, operators continued to exercise conservative and deliberate control over outage activities. For example, operators generally performed well during the draindown to mid loop, while in mid-loop, and in restoration from the mid-loop condition. Station and operations management promptly and appropriately identified and corrected the causes of minor performance weaknesses that occurred during the evolution. (Section O1.2). Infrequent lapses in operator performance continued, however, to occur. In this period, less than adequate technical specification tracking, knowledge deficiencies concerning vital instrument bus inverter operation, and poor operator turnover resulted in an NRC-identified violation of technical specifications concerning electrical bus train operability. The operators and plant management took prompt and appropriate action to restore the correct electrical configuration, identify the cause, and prevent recurrence. (Section O2.1).

A lapse occurred in the attention to proper implementation of the operator workaround program as a result of operations staff personnel changes. The existing operator workarounds did not adversely impact plant safety, however, continued inattention to underlying deficient conditions could adversely impact availability of plant equipment. The Operations Work Control Superintendent initiated corrective actions to improve performance in this area (Section O2.2). Operators continued to demonstrate greatly improved ownership of plant equipment. The operators demonstrated ownership by notifying plant management that an industry issue affecting emergency diesel generator air start systems applied to Salem. As a result, support staff initiated corrective actions. (Section O3.2).

Management oversight has improved the quality of equipment and personnel performance. For example, inspectors concluded that the PSE&G staff significantly improved the tagging program. The program changes, combined with improved operator procedure adherence, sharply reduced the frequency of tagging errors and eliminated breakthrough events. The tagging program is ready to support restart (Section O3.1). In addition, effective implementation of the Salem Assessment Restart Action Plan resulted in establishment of a new self assessment, development of procedures to improve the use and effectiveness of self assessment, conduct of comprehensive self assessments that documented weaknesses, and an increased percentage of self-identified issues. The inspectors concluded that the area of self assessment is ready for restart. (Section O7.1) Implementation of the Salem Human Performance Management Restart Action Plan resulted in significant improvement in the quality of oversight, teamwork, and assessment of worker performance. The inspectors concluded that it is too early to judge the

effectiveness of the trending results of the human performance errors, and that management/supervisory presence in the field needed improvement. However, on balance, the inspectors concluded that the improvements in human performance management were adequate to support restart. (Section O7.2)

Maintenance

The inspector concluded that PSE&G made significant improvements in the Foreign Material Exclusion (FME) program since the shutdown of the Salem units in mid 1995. In addition, management continues to respond to problems and to make progress in improving overall FME compliance. Inspectors concluded that the FME program is sufficient to support the restart of Salem Units 1 and 2. (Section M1.2) The PSE&G staff has also made significant improvement since the shutdown of the Salem units in mid 1995. In addition, management continues to respond to problems and continues to make progress in improving overall tagging compliance. This issue is no longer considered a restraint to the restart of Salem Units 1 and 2. (Section M1.3)

The ability to plan and schedule work, then accomplish the work according to the schedule and plan has been a long-standing weakness at Salem. The Salem management and staff made significant improvement in the effectiveness of planning and scheduling during the current shut down. During the current inspection period, plant management implemented the twelve week work schedule to further improve the effectiveness of planning and scheduling, and to reduce distractions and potential challenges to control room staff. (Section M7.1)

Engineering

Engineering did not adequately provide sufficient time for installation and testing of the CFCU modification consistent with the outage plan. Design engineers, quality assurance inspectors and senior nuclear shift supervisors provided frequent oversight of the installation. (Section E2.1).

In a letter to the NRC dated April 10, 1997, PSE&G provided a basis for reasonable assurance the Salem Technical Specification Surveillances and implementing procedures are adequate to support restart. (Section E7.1)

Plant Support

The licensee provided very effective exposure controls limiting individual exposures to only necessary and expected values. Continued diligence is necessary to ensure accurate postings reflect survey results and for the timely removal of unnecessary radiological hazards. The internal exposure assessment program has begun improving, but continues to exhibit weaknesses in staff training and procedure development. RP corrective action assignment has improved, however, the guidance has yet to be captured in a station-approved procedure. For several years, the RP services group has not provided ALARA program and RP program assessments as required, which resulted in a violation.

The security program was determined to be adequate to protect public health and safety. Appropriate corrective actions have been implemented to address previously identified weaknesses in the program. The alarm station operators were knowledgeable of their duties and responsibilities and security training was being performed in accordance with the NRC-approved training and qualification plan. Protected area detection equipment satisfied the NRC-approved Physical Security Plan (the Plan) commitments, security equipment testing was being performed as required by the Plan, and maintenance of security equipment was being performed in a timely manner as evidenced by minimal compensatory posting associated with security equipment repairs. Based on observations and discussions with security officers, the inspectors determined that they possessed the requisite knowledge to carry out their assigned duties and that the training program was effective. As an addition to the inspection, the UFSAR initiative, Section 4.2.2 of the Plan titled, "Vehicle and Cargo Controls," was reviewed. The inspectors determined, based on discussions with security supervision, procedural reviews, and observations, that vehicles were being searched and controlled prior to entry into the protected area as described in the Plan and applicable procedures.

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Summary of Plant Status

Unit 1 remained defueled for the duration of the inspection period.

Operators maintained Unit 2 in Mode 5, Cold Shutdown, for the duration of the period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

O1.2 Mid-Loop Operations - Unit 2

a. Inspection Scope

The inspectors reviewed the activities associated with the drain down, operation in and restoration from a mid-loop condition at Unit 2. The licensee established the mid-loop conditions to repair several leaking steam generator manway covers. The operators performed the drain down in accordance with operating procedure S2.OP-SO.RC-0006, *Draining The Reactor Coolant System < 101 FT With Fuel In The Vessel*, and restored the plant in accordance with operating procedure, S2.OP-SO.RC-0002, *Vacuum Refill Of The RCS*.

b. Observations and Findings

The inspectors noted several performance strengths during the drain down and recovery evolutions including:

- Strong plant management oversight as demonstrated by two special planning meetings and by assignment of a test engineer to supervise the evolutions.
- Good control room operator focus on key reactor plant parameters during the drain down and refill.
- A thorough pre-drain down briefing that included discussion of the compensatory actions for an unplanned loss of the residual heat removal (RHR) system.
- An instrument and controls technician appropriately identified and addressed a problem involving maintenance procedure S2.IC-CC.RHR-0005, that verified proper operation of the "Mid Loop" trouble alarm. Additionally, the licensee initiated an action request to review the alarm logic and setpoints to minimize the frequency of spurious alarm actuations.

- Proper installation of the temporary equipment including the temporary level indication tubing, and the establishment of reactor system pressure vent paths through pressurizer system spray valve (PS25), and through pressure relief valves (PR 1 and 2).

The inspector reviewed engineering evaluation, S-2-RC-MEE-1198, that evaluated use of the PS-25 vent path. The evaluation contained conservative assumptions and provided adequate justification for use of the PS-25 vent path.

Despite the generally good oversight and performance of this evolution the inspector noted some minor performance weaknesses including:

- The plant equipment operator did not consistently close the reactor vessel water level indication tubing isolation valve, and the S2.OP-SO.RC-0006 procedure did not provide guidance for leaving the valve open. The operations manager initiated an action request to enhance the procedural controls for this valve.
- The S2.OP-SO.RC-0002 procedure did not provide any limits or precautions for monitoring the rate of temperature change during the vacuum refill of the reactor plant. The inspector noted that the measured cooldown rate remained within the allowable technical specification cooldown rate 100 °F/hour. An operations supervisor initiated an action request to review whether additional temperature controls were required for this procedure.

The inspector considered the performance weaknesses minor and observed that the licensee appropriately addressed each issue.

c. Conclusions

Operators performed well during the drain down to mid loop, control of the plant while in mid-loop, and restoration from the mid-loop condition. The inspectors noted some minor performance weaknesses that station and operations management addressed promptly.

02 Operational Status of Facilities and Equipment

02.1 Vital Instrument Bus Operability

a. Inspection Scope (71707)

The inspector reviewed control room narrative logs and equipment status to ensure operation of the facility in accordance with technical specification (TS) requirements.

b. Observations and Findings

At 11:01 p.m. on April 7, 1997, with Unit 2 in mode 5 and with the nos. 2A and 2B electrical bus trains operable, operators transferred the no. 2C vital instrument

bus inverter to its alternate AC source in preparation for no. 2C 125 vdc bus outage. At 12:36 a.m. on April 8, operators locked out the 2C emergency diesel generator (EDG) as part of the bus outage. Technical Specification 3.8.2.2 for Salem Unit 2 requires that, in modes 5 and 6, two operable AC electrical bus trains energized from sources of power other than a diesel generator but aligned to an operable diesel generator. Each train consists of one 4KV vital bus, one 460V vital bus and associated control centers, one 230V vital bus and associated control centers, and one 115V instrument bus energized from its respective inverter connected to its respective DC bus. At 1:13 a.m. on April 8, operators declared the 2A EDG inoperable following a 2A safeguards equipment control trouble alarm. The safeguards equipment control starts its respective EDG on under voltage or accident conditions, and controls the sequence of the safeguards equipment onto the associated vital bus. The Technical Specification 3.8.2.2 action statement requires that with less than two operable vital bus trains, establish containment integrity within eight hours. Operators entered the TS 3.8.2.2 action statement and began to restore the 2C EDG. At 4:42 a.m. on April 8, following a 2C EDG operability run, operators declared 2C EDG operable and exited TS 3.8.2.2.

At approximately 1:00 p.m. on April 8, the inspector noted that operators considered the 2A EDG inoperable and the 2C electrical bus train operable. The operators had not, however, realigned the 2C vital instrument bus to its inverter as required by TS 3.8.2.2. The operating shift did not know the 2C vital instrument bus inverter alignment status and did not recognize the importance of that status relative to TS requirements. During discussions with the inspector, the control room operator recognized the significance of the inverter alignment, and initiated action to restore the 2C inverter to its correct alignment. At 4:00 p.m. on April 8, operators completed the restoration and appropriately exited TS 3.8.2.2.

The operators initiated a significance level 1 root cause analysis of the event (CR 970408283). Operations management improved the TS tracking log and mandated additional operator training on inverter lineup and operability requirements. In addition, operations management noted that the action statement requirement to establish containment integrity would require isolating the residual heat removal flow path, since the initial accident alignment of RHR in the safety injection mode takes suction from the refueling water storage tank. Plant management stated their intent to request a change to the action statement requirement, perhaps similar to the standard technical specification requirement to suspend operations involving core alterations, positive reactivity changes, or movement of irradiated fuel and to initiate corrective action to restore the minimum required vital bus equipment.

The event had no actual safety consequence, since a loss of off-site power did not occur during the period of time (approximately 15 hours) that the licensee did not maintain containment integrity with less than 2 AC electrical bus trains operable. The problem had minor safety significance as a result of Unit 2 plant status (shutdown for 22 months) and the operator's ability to maintain the facility in the shutdown condition for an extended time period. The inspector concluded that failure to establish containment integrity within eight hours with only one operable

AC electrical bus train while in mode 5 (Cold Shutdown) is a violation of TS 3.8.2.2. (50-311/97-07-01)

Subsequent to the event, the inspector identified that S2.OP-SO.115-0013, Revision 5, *2C 115V Vital Instrument Bus UPS System Operation*, Section 5.9.4 did not contain adequate guidance to ensure TS 3.8.2.2 compliance when operating the inverter on DC only. Operators initiated action to revise S2.OP-SO-115-0013. In addition, the Operations Technical Support Superintendent identified that S2.OP-ST.4KV-0002, Revision 7, *Electrical Power Systems AC Distribution*, did not check Vital instrument bus inverter alignment to its AC supply in mode 5 or 6. Thus, procedure S2.OP-ST.4KV-0002 did not satisfy the surveillance requirements of TS 4.8.2.2. The operations staff revised the procedure and satisfactorily performed the surveillance within the 24 hours allowed by TS Section 4.0.3. The operations staff initiated CR 970410123 to evaluate the apparent cause for the inadequate surveillance and to determine why the Technical Specification Surveillance Improvement Project (TSSIP) phase one did not identify and correct the deficiency. This licensee-identified and corrected violation of failing to properly test the vital instrument bus inverter as required by TS 4.8.2.2 is being treated as a non-cited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

c. Conclusions

Less than adequate technical specification tracking, knowledge deficiencies concerning vital instrument bus inverter operation, and poor operator turnover resulted in an NRC-identified violation of technical specifications concerning electrical bus train operability. The operators and plant management they took prompt and appropriate action to restore the correct electrical configuration, identify the cause, and prevent recurrence.

02.2 Operator Workarounds and Control Room Deficiencies

a. Inspection Scope (92901)

The inspector assessed the effectiveness of continued implementation of SC.OP-AP.ZZ-0030, *Operator Workaround Program*.

b. Observations and Findings

Salem procedure SC.OP-AP.ZZ-0030 established the Operations Manager's expectations concerning the identification, tracking, and management of operator workarounds and burdens. The inspector identified that the operations staff failed to meet these expectations in the following areas:

- The operations work control superintendent did not maintain an updated workaround listing available to the operating shifts. (A 10-week old listing was available in front of narrative log.)

- The operations shift support superintendent did not ensure that operating shifts were knowledgeable of operator workarounds and burdens.
- The operations work control superintendent did not perform a quarterly assessment to determine the aggregate impact of workarounds on the plant and operator capabilities.
- The operations work control superintendent did not coordinate effectively with the maintenance department to remove operator workarounds and operator burdens.

The operations work control superintendent promptly initiated actions to improve operator awareness (including an updated listing in the control room) and to assess, manage, and coordinate the removal of operator workarounds and burdens. The inspector noted that the recent turnover of work control superintendents and licensed operators directly responsible for the program contributed to the observed weakness in this area.

c. Conclusions

Operations management did not ensure proper implementation of the operator workaround program. The existing operator workarounds did not adversely impact plant safety, however, continued inattention to underlying deficient conditions could prevent the normal operation of structures, systems and components. The operations work control superintendent initiated corrective actions to improve performance in this area.

03 Operations Procedures and Documentation

03.1 Operator Questioning Attitude (71707)

Reactor operators demonstrated good questioning attitudes and a willingness to improve technical specification surveillance procedures. Operators identified and documented questions concerning potential diesel generator preconditioning (AR 97040908), potential operation of pressurizer overpressure protection system (POPS) outside the design basis (AR 970421147), and diesel generator hot restart testing enhancements (AR 970424061). The inspector concluded that operators demonstrated a safety-conscious questioning attitude to ensure appropriate management review of potentially safety significant technical issues.

07 Quality Assurance in Operations

07.1 Self Assessment Capability, NRC Restart Item III.21 (Closed) and Salem Restart Assessment Plan (Closed)

a. Inspection Scope

The inspectors reviewed the licensee's self assessment program consisting of work packages and associated procedures prepared by the licensee to satisfy the Salem

Self Assessment Restart Action Plan as defined in the licensee's letter of March 26, 1996, to determine whether the actions within the plan that are needed for restart have been completed. The inspection also reviewed the implementation and effectiveness of the program to meet the expected results cited in the plan through audits of self assessment reports in the areas of maintenance, operations and planning, and areas that needed significant improvement at the time of plant shutdown. Interviews were conducted with the Supervisor, Salem Station Projects; the Salem Self Assessment Coordinator; and several members of the Quality Assurance organization. The inspection was conducted following the guidance for self assessment inspections that was included in Inspection Procedure 40500.

b. Observations and Findings

From July 9 through July 11, 1996, and from January 6 through January 9, 1997, NRR inspectors performed an inspection of the Salem Self Assessment Restart Action Plan. The inspectors reviewed the actions that the licensee had taken to satisfy the items in the plan, Revision 8, dated July 16, 1996. The objective of the plan was to develop the capability and acceptance of the Salem organization such that self assessment is used effectively and routinely to improve performance continually. The plan consists of two Problem Statements needing resolution to achieve an acceptable self assessment program. Problem Statement No. 1 stated that the existing self assessment program was limited in scope and that the results did not accurately identify the root causes of performance weaknesses. Problem Statement No. 2 stated that the Salem work force, in general, rarely performed self assessments, and when they were performed, they were done so inconsistently.

The licensee expected to establish a new culture that encouraged self assessment is an automatic and explicit step of every action by each employee; established procedures to improve the use and effectiveness of self assessment; conducted comprehensive organization self assessments that document its major performance weaknesses and the completed actions that address these weaknesses; and demonstrated an increased trend in the percentage of self identified issues.

Revision 8 to the plan indicated that all restart actions needed to address each of the Problem Statements have been completed. The inspectors audited (or reviewed) all of the backup files for the Problem Statement actions to review the bases for licensee's findings.

Following are some of the items reviewed by the inspectors: (1) the Self Assessment procedure for routine operations, SC.SA-AP.ZZ-0034(Q), Revision 1, (2) the Self Assessment procedure for restart following outages, SC.SA-SD.ZZ-0035(Q), Revision 0, (3) the qualifications of the Salem Self Assessment Coordinator, (4) Self Assessments of Maintenance (for the periods of October 5-20, 1995, February 20 -23, 1996, and December 3 - 13, 1996), Radiation Protection (for the period of June 1 through June 29, 1996), Operations (December, 1996), and Planning (December 18, 1996), and (5) Self Assessment of the Self Assessment Program (for the period of May 22 - June 15, 1996).

In addition, the inspectors reviewed the closure documents for Problem Statement No. 1, dated February 15, 1996, and Problem Statement No. 2, dated July 8, 1996. The inspectors verified completion of all the actions in the plan required prior to restart.

Problem Statement No. 1 stated that the existing self assessment program was limited in scope and the results did not accurately identify the root causes of Salem performance weaknesses. To assess the actions taken to address Problem Statement No. 1, the inspectors reviewed several of the Self Assessment procedures, interviewed the Station Self Assessment Coordinator, and reviewed his qualifications. The inspectors considered the self assessment program broad in scope and effectively managed, and able to effectively identify performance weaknesses. These weaknesses are then handled by the Corrective Action Program, discussed in NRC Inspection Report 50-272/311, 96-18. This Inspection Report notes improvement in root cause analysis skills and concludes that the actions taken to improve the Corrective Action Program supported restart. Thus, the inspectors concluded that the objectives of Problem Statement No. 1 of the Self Assessment Restart Action Plan had been met.

Problem Statement No. 2 stated that, in general, the Salem work force rarely performed self assessments, and when they were performed, they were done inconsistently.

With regard to the frequency of performing self assessments, the inspectors noted that the Self Assessment procedure for routine operations stated that the frequency should be based on the inputs from the preceding self assessments, but that at least four per year should be performed. It also stated that at least one assessment per year should address the department's performance in the area of Corrective Actions. The Self Assessment Coordinator stated that the four self assessments per year do not have to be assessments of the entire department, but rather of a particular departmental function.

The Self Assessment procedure for restart following outages required a full department Self Assessment prior to restart from a refueling outage or extended outage of approximately four weeks. The Self Assessment Coordinator informed the inspectors that this procedure will be changed to require that a self assessment be performed prior to restart from any outage, reactor trip or inadvertent safety injection actuation and that the scope of that self assessment will be determined based on the cause of the outage.

The inspectors concluded that the frequency of self assessments required by these two procedures has been met and satisfies the part of Problem Statement No. 2 that states that the Salem work force rarely performed self assessments.

In order to assess the progress the licensee has made in meeting the inconsistency statement of Problem Statement No. 2, the inspectors reviewed self assessment reports in the areas of maintenance, operations, planning, and radiation protection. The inspectors found that the comprehensive Self Assessments effectively identified

areas that needed improvement. For example, the Self Assessment of the Maintenance Department for the period of October 5-20, 1995, concluded that there were weaknesses that needed to be resolved before the Maintenance Department would be ready to safely and reliably support restart of Salem and continued safe full power operation. The Self Assessment was a contributing factor in management's decision to impose the Maintenance Intervention and provide training for department personnel. The Self Assessment for the period of December 3 - 13, 1996, noted improvements in the maintenance area, but stated that sustained performance in this area will be required to determine the effectiveness of the Maintenance Intervention. The Self Assessment stated that several of the people that were interviewed thought that they had learned a lot from the Maintenance Intervention and that it will help them perform their job in a more professional manner. Furthermore, the NRC Resident Inspector staff noted improvement in the performance of the Maintenance Department as noted in Inspection Report 50-272/311, 97-03, dated April 3, 1997.

The recent self assessments of operations and planning concluded that both areas were ready for restart, but noted areas that needed additional attention. These areas, which will be handled by the Corrective Action Program, include procedure use and adherence, management presence in the field, and tagging.

The percentage of self-identified problems improved from about 60 per cent in November, 1995, to about 90 per cent in June, 1996. This percentage remained between 80 and 90 per cent, with several short-duration drops due to increased outside inspections. This is an indication of the effectiveness of the Self Assessment program.

The implementation of the management and peer observer program has shown improvement. A new process instituted pre-printed index cards used to provide field observation comments. This has increased the number of management observations being reported. Peer observations are being done by supervisors, rather than peers, because of objections by the union. The inspectors concluded that this is an acceptable alternative and has been effective in identifying concerns.

Based on their review of several key self assessments, and noting the increase in the percentage of problems that are self-identified and the improvements in performance in the areas of operations and maintenance, the inspectors concluded that the inconsistency part of Problem Statement No. 2 has been adequately corrected.

c. Conclusions

Effective implementation of the Salem Assessment Restart Action Plan resulted in establishment of a new self assessment, development of procedures to improve the use and effectiveness of self assessment, conduct of comprehensive self assessments that documented weaknesses, and an increased percentage of self-identified issues. The inspectors concluded that the area of self assessment is ready for restart.

07.2 Salem Human Performance Restart Plan (Closed)

a. Inspection Scope

The inspectors reviewed the Salem Human Performance Restart Action Plan, Revision 6, dated December 3, 1996, to determine whether actions within the plan needed for restart had been completed. The inspection also reviewed the implementation and effectiveness of the program, as documented in audits of human performance, in meeting the expected results cited in the plan. Inspectors interviewed the Supervisor, Salem Station Projects; Planning and Development Manager, Human Resources; the Project Manager, Restart Plan Coordinator; the Manager, Corrective Actions and Quality Services; the Supervisor, Corrective Actions; several members of the Quality Assurance organization; and a random selection of plant personnel.

b. Observations and Findings

From July 9 through July 11, 1996, and from January 6 through January 9, 1997, NRR inspectors performed an inspection of the Human Performance Restart Plan. The plan consists of six Problem Statements needing resolution to achieve an acceptable Human Performance Program. The Expected Results in the plan are that the management and supervisory positions are filled with the right people; that high standards are established, communicated, understood and demonstrated by the employees; that leaders are working together; that there is an increased number of people on Performance Improvement Plans; and that the number of incident reports due to human error show a consistent decreasing trend.

Revision 6 of the plan, dated December 3, 1996, indicates that all of the restart actions needed to address each of the Problem Statements have been completed. The inspectors audited the backup files for selected actions to review the bases for the licensee's findings regarding supervisory performance improvement (Actions 1e, 1g, and 1h); expectations, work processes, performance indicators (2b, 2c, 2g, 2j, 2l); leadership training and self assessment skills (3c, 3e); communications (4c, 4e, 4g); teamwork and management presence in the field (5.1, 5.3); human performance trending and causes (6.1, 6.2).

In addition, the inspection also reviewed the closure inputs for: Problem Statement No. 1, dated October 3, 1996; Problem Statement No. 2, dated October 2, 1996; Problem Statement No. 3, dated October 3, 1996; Problem Statement No. 4, dated June 19, 1996; Problem Statement No. 5, dated November 13, 1996; and Problem Statement No. 6, dated November 15, 1996.

As part of Problem Statement No. 1, the performance of the managers and supervisors was evaluated. As a result, many personnel changes were made. The inspectors, based on interviews with the licensee's staff and discussions with the NRC Resident Inspectors, concluded that the changes have resulted in a stronger management team at the station. The inspectors concluded that the objectives of Problem Statement No. 1 have been met.

As part of Problem Statement No. 2, the licensee has instituted a program known as Breakthrough FOCUS in which selected personnel are sent offsite for five days of training intended to change the culture at the station and lead to improvements in work practices. Approximately 400 people have received this training.

Based on the results of the Culture Index Survey, improvement is taking place in all of the five key characteristics known to be present in high performing organizations: missions and goals, knowledge and skills, lateral integration, simple work processes, and self improvement culture. The inspectors concluded that the objectives of Problem Statement No.2 have been met.

As part of Problem Statement No. 3, the licensee offers, on a voluntary basis, a Dale Carnegie personal development course which been taken by approximately 350 people. All supervisors have taken MARC training which involves the appropriate use of direction and discipline in the workplace. The inspectors conclude that the leadership training and self assessment objectives of Problem Statement No. 3 have been met.

As part of Problem Statement No. 4, to improve communications the licensee started conducting meetings on a regular basis to keep staff informed of key issues and hear feedback from their management. Use was made of a publication called "Nuclear Today" to communicate key items of progress and key issues regarding Salem Restart Plans. The Communications Exchange Process was started in late 1995 to communicate key messages from the Salem management team and the departments through face-to-face weekly meetings. Feedback was requested and communicated to the Salem management team. Face-to-face meetings were initiated to increase department manager/supervisor field presence. The licensee also conducted audits through questioning of Salem employees regarding the effectiveness of the Communications Exchange Process. Although the licensee concludes that improvement in the quality of communications has occurred, the face-to-face mode is lagging with respect to other modes of communication.

The inspectors observed the Management Meeting that was held on July 10, 1996, where management goals, schedules, performance indicators and key plant and licensing issues were discussed. The Chief Nuclear Officer/President of the Nuclear Business Unit to first level supervision attended the meeting. It began with a statement from someone who had recently completed the Breakthrough training. He appeared to be satisfied with the training. The inspectors found that the meeting was effective in improving communications at the site.

The inspectors agree that communications has improved as evidenced by published information placed on bulletin boards throughout the plant and a sampling of staff meetings. The inspectors conclude that the objectives of Problem Statement No. 4 have been met.

One of the actions in Problem Statement No. 5 is to increase manager/supervisor presence in the field. The licensee stated that is not able to verify the time spent in the field by managers and supervisors, but believes it is improving. The inspectors,

based on random discussions with plant personnel and discussions with the Resident Inspectors, agree that manager/supervisor presence in the field has improved, but improvement in this area is still needed.

Another objective of Problem Statement No. 5 was to improve teamwork in the Salem management group. The regularly scheduled Management Meetings previously discussed under Problem Statement No. 4 have been effective in improving teamwork at the site. Thus, the inspectors conclude that the objectives of Problem Statement No. 5 have been met.

As a result of comments from an independent assessment team, the licensee added Problem Statement No. 6 dealing with trending of human performance. The trending of human performance, using methodology developed by FPI International, entails the classification of human error events as either breakthrough events, near misses, or precursors. The number of occurrences is then calculated per 10,000 person-hours and plotted month-to-month. The inspectors reviewed the results for the period of August through November of 1996 and noted a slight decrease in the number of human error events. The inspectors concluded that the process is a good method for trending human error events, but it has not been in place long enough to determine the actual human error trend at the station.

c. Conclusions

Implementation of the Salem Human Performance Management Restart Action Plan resulted in significant improvement in the quality of oversight, teamwork, and assessment of worker performance. The inspectors concluded that it is too early to judge the effectiveness of the trending results of the human performance errors. The inspectors noted increased supervisory presence in the field, however, station management does not have an effective tool for monitoring these observations. However, on balance, the inspectors concluded that the improvements in human performance management were adequate to support restart.

08 Miscellaneous Operations Issue

- 08.1 (Closed) Inspector Follow-up Item 50-272&311/96-16-02: improperly coded corrective action documents. Salem staff corrected the significance coding on several corrective action documents that an NRC inspector identified as incorrect. Salem staff also determined that the mis-coding was not a generic issue. This item is closed.
- 08.2 (Closed) Violation 50-272&311/94-24-01: failure to ensure containment integrity. Technical Specification 3.9.4 requires containment integrity during core alterations. The loss of integrity that occurred in October 1994, resulted from open service water vent valves inside containment thus providing a release path to open service water drain valves outside containment. Corrective actions to this violation were inadequate as indicated by a similar event the inspectors documented as a violation in NRC Report 50-272&311/96-18 (VIO 96-18-02). In this more recent event, operators lost containment integrity when mechanics removed a service water valve

in piping outside containment at a time when service water vents for the piping were open inside containment. For administrative purposes, item 94-24-01 is closed and corrective action adequacy will be tracked under item number 96-18-02.

- 08.3 (Closed) Violation 50-272&311/96-07-02: violation of Technical Specification 6.8.1 requirements. An equipment operator failed to perform a procedure step to close the control power breaker after racking up a 13kV breaker and subsequent failure of the responsible senior reactor operator to initiate appropriate action. The inspector concluded PSE&G staff's response to the violation was adequate. Also, the NRC staff determined the Corrective Action Restart Plan appropriately addressed generic corrective action issues. This violation is closed.
- 08.4 (Closed) Violation 50-272&311/96-15-01: corrective action for operator performance problems. This violation identified that Operations staff inadequately investigated an instance where operators inadvertently operated an emergency control air compressor without service water cooling being supplied to the compressor. Operations management developed procedure SC.OP-AP.ZZ-0114(Z), *Event Identification and Investigation*. The procedure provides guidance to operators for initial shift investigations of events. The inspector determined the procedure was adequate and confirmed Operations staff trained the operators on the new procedure. Also, NRC staff concluded Salem staff adequately addressed the generic issue of corrective action through the Corrective Action Restart Plan. This violation is closed.
- 08.5 (Closed) Violations 50-272&311/EA94-239-01012, 50-272&311/EA96-177-01012, and 50-272&311/EA96-177-01022: discrimination against employees engaged in protected activities as defined in 10 CFR 50.7 (a)(1). A brief summary of each event follows:

Violation EA94-239-01012

In December 1992, two Safety Review Group (SRG) engineers attempted to document a safety concern on a corrective action document, however, the then-General Manager - Salem Operations tried to dissuade them from issuing the document. When they suggested that they may need to file a safety concern he told them to get out of his office.

Violation EA96-177-01012

In 1993 and 1994, an Onsite Safety Review (OSR) engineer received negative performance reviews from the manager-Nuclear Safety Review because the OSR engineer supported the two engineers, mentioned above, regarding their roles in the December 1992 event.

Violation EA96-177-01022

In August 1994, PSE&G management transferred an SRG engineer, against his will, from the Salem organization to the Hope Creek organization because of his role in the December 1992 event.

The inspector reviewed the responses to these violations and examined a number of supporting documentation such as corporate memos, training material, station procedures, and interviewed members of the Employee Concerns Program. The corrective actions for these violations was comprehensive. They include:

- Since 1994, senior PSE&G management made significant personnel changes throughout the Salem and Hope Creek organizations. The managers involved in the above events are no longer at Salem or Hope Creek.
- PSE&G management communicated, and continues to emphasize, company policy regarding safety concerns. The policy is that expressing a concern about safety is not only acceptable, it is a professional responsibility.
- Management training and General Employee Training emphasizes handling of safety concerns.
- A formal Employee Concerns Program is in place with dedicated staff. Employees have access to this program via an office visit, mail, drop box, phone, or exit interview.

Additionally, based on observations made over the past eight months during plant inspection activities, the inspector has noted significant improvement in company environment regarding openness toward safety concerns. Management has also improved the corrective action programs that address those concerns. The inspector concluded senior PSE&G management took comprehensive and effective corrective actions in response to the discrimination events. These violations are closed.

- 08.6 (Closed) LER 50-272/96-041 - missed surveillance for radiation monitors source check. This LER was a minor issue and was closed.
- 08.7 (Closed) LER 50-311/96-011 - missed surveillance for sampling boron concentration of refueling canal. The inspectors discussed the subject of this LER in NRC Report No. 50-272&311/96-12. The LER did not reveal any new issues. This LER is closed.
- 08.8 (Closed) LER 50-311/96-013 - missed surveillance for performing tritium grab samples when the refueling canal was flooded. This event occurred due to a misinterpretation of the technical specification requirement to sample within twenty-four hours of flooding the refueling canal. Operators thought the twenty-four hour interval began at the completion of the flooding. Salem staff later concluded the interval started at the initiation of flooding and revised the appropriate procedure accordingly. The inspector verified Salem staff revised the procedure. This LER is closed.

II. Maintenance**M1 Conduct of Maintenance****M1.1 General Comments****a. Inspection Scope (62707)**

The inspectors observed all or portions of the following work activities:

- 970224263: steam generator primary manway leak repair
- 970117323: 2B EDG exhaust manifold leak repair
- 961227217: CFCU SW piping modification
- 970209046: no. 21 RHR pump casing flange gasket leak repair

The inspectors observed that the plant staff performed the maintenance effectively within the requirements of the station maintenance program.

b. Inspection Scope (61726)

The inspectors observed all or portions of the following surveillances:

- S2.OP-ST.DG-0002: 2B diesel generator surveillance test
- S2.RE-ST.ZZ-0002: shutdown margin calculation
- S2.OP-ST.DG-0001: 2A diesel generator surveillance test
- S2.OP-ST.DG-0019: 2A diesel generator hot restart test
- S2.OP-ST.CAN-0007: refueling operations - containment closure
- S2.OP-ST.4KV-0002: electrical power systems AC distribution
- S2.OP-ST.PZR-0002: inservice testing PORV and PORV block valves modes 1-6

The inspectors observed that plant staff did the surveillance safely, effectively proving operability of the associated system.

M1.2 Adequacy of the Foreign Material Exclusion (FME) Program, NRC Restart Inspection Item III.5 (Closed)**a. Inspection Scope**

Inspection Report 50-272,311/96-08 documented an inspection performed in August 1996 for this restart item. The inspector concluded at that time that although much had been done to improve the FME program, problems still existed with implementation of the program. Since then, the inspector made several field tours for the purpose of monitoring FME compliance and reviewed the corrective action for problems identified in the previous inspection report.

b. Observations and Findings

The inspector found that since the August inspection, implementation of the FME program has improved. When violations of the program have been found, Salem staff has documented these in the corrective action program and in their trending program. Also, Salem management has responded to these violations with pre-job briefings with emphasis on FME practices, with follow up observations, and with additional FME training for Salem maintenance personnel. During plant tours, the inspector found that when required, FME areas have been posted and adequate precautions have been taken to prevent introduction of foreign material into systems and components. Numerous examples of good FME practices have been witnessed during these plant tours.

c. Conclusions

The inspector concluded that PSE&G has made significant improvement since the shutdown of the Salem units in mid 1995. In addition, management continues to respond to problems and continues to make progress in improving overall FME compliance. This issue is adequate to support the restart of Salem Units 1 and 2.

M1.3 Tagging, NRC Restart Item III.3 (Closed)

a. Inspection Scope

In response to numerous tagging errors, Salem management established an improved Safety Tagging Program. The inspectors assessed the adequacy of the revised program.

b. Observations and Findings

Salem staff analyzed a data base of approximately 100 tagging issues, covering the period November 1994 through January 1996. Their analysis showed tagging errors had root causes in inadequate program design, inadequate training, inadequate supervisory methods, and inadequate work practice. In response, the Operations staff: sharply reduced the number of people authorized to perform tagging evolutions; performed a job task analysis and issued qualification cards for tagging; re-qualified personnel according to their tagging responsibilities; filled positions in the work control center only with individuals qualified to new tagging standards; and issued a significant revision to the tagging procedure, NC.NA-AP.ZZ-0015(Q), *Safety Tagging* on January 15, 1997.

The inspector reviewed performance indicators for the month following implementation of the revised tagging procedure to determine whether the new program was effective. The inspector noted three relatively minor errors. Also, the rate of tagging errors was the lowest in over a year, even though during this recent interval plant personnel performed many more evolutions (445) than during a similar interval in 1996 (341). The inspector also assessed the significance of the errors and noted that no event was a breakthrough event (defined as an event where

process barriers failed, with potential or actual personnel injury or equipment damage). Historically, there was at least one breakthrough event a month from August 1996 to January 1997. The inspector attributed the favorable performance in tagging to operators adequately implementing the improved procedure.

The inspector also noted that management added a self-assessment element to the tagging program. Senior reactor operators evaluate one out of every five tagging evolutions and each maintenance supervisor conducts three job evaluations per week. Salem staff initiated condition resolution reports to address deficiencies identified as a result of these assessments.

c. Conclusions

The inspector concluded that PSE&G has made significant improvement since the shutdown of the Salem units in mid 1995. In addition, management continues to respond to problems and continues to make progress in improving overall FME compliance. This issue is adequate to support the restart of Salem Units 1 and 2.

M7 Quality Assurance in Maintenance Activities

M7.1 Work Control

a. Observations and Findings

During the inspection period plant managers noted continued difficulty in completing daily work as planned and scheduled. In particular, the managers noted that plant staff continued to distract control room operators with requests for authorization of work not previously planned for that day. The requests caused operators and shift technical advisors to spend time reviewing the potential impact of the requested activities on plant conditions and already ongoing activities. The review provided the potential to distract control room staff from their normal duties.

As a result of their concern about scheduling effectiveness, the plant managers decided to direct operators to refuse to authorize work not previously scheduled, unless the operators concluded that failure to perform the work would have an adverse impact on safety. In addition, the managers implemented the twelve-week work schedule for Salem Unit 2, starting with the activities for week five of the twelve week schedule. The managers expect that the twelve week schedule will improve the ability of plant staff to plan and control the daily work.

b. Conclusions

The ability to plan and schedule work, then accomplish the work according to the schedule and plan has been a long-standing weakness at Salem. The Salem management and staff made significant improvement in the effectiveness of planning and scheduling during the current shut down. During the current inspection period, plant management implemented the twelve week work

schedule to further improve the effectiveness of planning and scheduling, and to reduce distractions and potential challenges to control room staff.

M8 Miscellaneous Maintenance Issues

M8.1 (Closed) Unresolved Item 50-272 & 311/94-01-01: control of maintenance troubleshooting. In February 1994, maintenance technicians inadvertently caused the opening of the main steam dump valves to the condenser. This item was opened pending the investigation of the event. Salem staff determined that the root cause was inadequate pre-job planning. Since that time, maintenance personnel have been through a significant training program to strengthen technical skills and to emphasize attention to detail. The inspector found this training appropriate to address this event. This item is closed.

M8.2 (Closed) Preventive Maintenance Change Request Backlog

a. Inspection Scope

The inspector reviewed the Salem maintenance program relative to the outstanding backlog of requests for changes. Specifically, the inspector held discussions with Preventive Maintenance Group staff members, reviewed the list of outstanding Preventive Maintenance Change Requests (PMCRs), reviewed a sample of PMCRs, and reviewed procedures in place to control the processing of PMCRs.

b. Observations and Findings

From discussions with the Preventive Maintenance Group staff, the inspector learned that there were 249 outstanding PMCRs for Salem Unit 2. They expect that this backlog will be reduced by a factor of eight to about thirty by the end of 1997. Although the group is short of staff, recruiting is in progress to obtain additional personnel. The inspector obtained a list of all 249 outstanding PMCRs and reviewed it to select a sample of those that by the description appeared to have a potential for safety impact (i.e., due to a safety function of the component and the age of the PMCR). The inspector selected fifteen and then reviewed the details of the PMCR documentation for those sampled. None were found which the inspector believed would present a safety impact even if delayed until years' end.

From the review of the administrative procedures, the inspector found that the procedures provide guidance for processing of PMCRs from initiation until closure. From a discussion and demonstration regarding the computerized database, the inspector found that it contained pertinent data related to the PMCRs such as description, reason for initiation, and due date. The data was also easily retrieved. The inspector also learned that PSE&G actively monitors the size of the backlog via a PMCR "Burn-Off" curve. Also, PSE&G staff screen PMCRs and assign due dates to ensure that they make changes in sufficient time to support the next performance of the task.

c. Conclusions

From the inspection observations, the inspector found it reasonable to conclude that the backlog of PMCRs, although sizable, does not represent an impact to the safe operation of Salem Unit 2. The administrative control of the PMCRs is appropriate and effective. PSE&G staff is aware of the size of the backlog and is working to reduce it.

- M8.3 (Closed) Violation 50-272&311/95-12-01: inadequate corrective action for ITE circuit breaker problems. During the period from December 4, 1989, to March 29, 1995, Salem staff documented thirteen failures of safety related ITE breakers. During this time, management failed to perform a timely root cause analysis and failed to implement corrective action to prevent repetitive failures. Inspectors identified two significant concerns with this issue: the technical issue of correcting the hardware problem, and the programmatic problem of lack of rigor and timeliness in PSE&G staff determining the root cause.

Regarding the first concern, PSE&G staff, with the aid of the breaker manufacturer, determined the root cause to be less than adequate preventive maintenance. PSE&G engineers enhanced the preventive maintenance procedure and performed the procedure on suspect ITE breakers (i.e., those with sluggish closing times). The engineers later decided to perform an extensive overhaul on all ITE breakers. The inspector confirmed that Salem staff completed this overhaul for Unit 2 and that plant staff is tracking overhaul tasks for Unit 1 breakers. The inspector's review of the recent performance history revealed no examples of breaker failure following overhaul. Also, during an interview with the system engineer, the inspector learned that a newly approved preventive maintenance procedure provides for in place in-place breaker timing tests every 18 months. These tests detect degradation in breaker performance.

Regarding the programmatic issue, PSE&G management implemented extensive changes to improve the corrective action program. Management documented those changes in their response to NRC Restart Issue III.a.10, Corrective Action Program. NRC staff reviewed the program, concluded the improvements have been effective, and documented closure of that restart issue in NRC Report 50-272&311/97-03. Based on that review and on the information in the previous paragraph, this violation is closed.

- M8.4 (Closed) LER 50-311/96-014 - emergency diesel generator automatic start - ESF actuation. The EDG automatically started during a manual transfer of one off-site power supply to another. Salem staff determined the cause to be a defective relay in a vital supply breaker. The corrective actions included replacing the breaker, notifying the manufacturer, and revising the breaker inspection procedure to include details for inspecting the relay. Additionally, Salem staff identified other relays susceptible to the defect and found that the relays operated satisfactorily. The inspector considers this LER closed.

- M8.5 (Closed) LER 50-311/96-012 - engineered safety feature actuation, 2A 4kv vital bus undervoltage. While performing an electrical test of the service water pump motor, two potential transformer fuses opened causing one of three undervoltage relays to trip. When operators tried to measure phase to phase voltages using a local panel voltmeter, a second undervoltage relay tripped causing initiation of the Safeguards Equipment Controller. This started the 2A EDG. There was little safety significance since the EDG started and loaded the bus as designed and the plant was already shutdown and defueled.

Salem engineers performed a formal root cause analysis of the event. They attributed the cause of the first incident, the blown fuses, to lack of attention to detail during testing. The cause of the second undervoltage relay tripping was a design deficiency which is only present when one of the two potential transformers has open fuses. The inspector reviewed the corrective actions and determined they were adequate.

- M8.6 (Closed) LER 50-311/96-015 - breach of containment closure during core reload. Inspectors documented this issue in NRC Inspection Report 50-272&311/96-18. As a result of this event, the NRC staff issued violation 50-311/96-18-02.

- M8.7 (Closed) LER 50-311/96-016 - missed surveillance for determining response time of high containment gaseous radioactivity ESF actuation. Technical specifications require a verification of this ESF actuation response time every eighteen months. The maintenance department tracks this surveillance requirement using a proceduralized computer search of required recurring tasks. The database incorrectly indicated that the surveillance was applicable in modes 1 through 5. The technical specification requirement is applicable in modes 1 through 6.

The inspector reviewed the corrective action as detailed in Salem's root cause analysis of the event and concluded that it was satisfactory. In addition, Salem staff addressed the generic issue of technical specification problems with the Technical Specification Surveillance Improvement Program (TSSIP).

- M8.8 (Closed) LER 50-272/96-021 - potential common mode failure for 28V DC battery chargers due to molded case circuit breaker damage. During a review of maintenance inspections, Salem staff determined that circuit breakers within the 28V DC battery chargers experienced common mode failure of the terminals involving cracked terminal blocks. In response to this finding, Salem staff revised maintenance inspection procedures to require inspection specifically for the cracking which precedes this failure mode. In addition, PSE&G staff investigated whether similar breakers were in use in other applications at Salem and Hope Creek. Although PSE&G staff did locate other applications, none was configured in the manner which induced the cracking. The inspector concluded that the corrective action for this event was satisfactory.
- M8.9 (Closed) LER 50-272/96-025 - inadequate calibration of overpower delta temperature protection channels. While performing the calibration of a turbine first stage impulse pressure channel, the technician noticed that the output of the Hagan

lead/lag module was higher than expected. Subsequent testing revealed that the method used to calibrate the modules was inadequate. The method yielded a non-conservative output. The inspector learned that this was reportable because these modules provide output which is used to shutdown the reactor to protect against excessive power.

The inspector reviewed the corrective action for this problem and learned Salem staff corrected calibration procedures and then properly calibrated the units. Also, the investigation determined that other modules in the plant were also being improperly calibrated so PSE&G staff applied corrective actions to these as well. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Manual.

M8.10 (Closed) LER 50-272/96-027 - diesel watt meter inaccuracies not accounted for in surveillance testing. There are three technical specification requirements to perform EDG testing with the diesels loaded to 2500 - 2600 kw. In October 1996, Salem staff determined that the diesel watt meter inaccuracy was actually ± 65 kw. This meant that even if the testing were performed with a meter indication of exactly 2550 kw, the actual load could be 15 kw above or below the prescribed load band. The inspector considered the safety significance of this event to be minimal since the EDGs were still capable of performing their intended function. Salem staff revised the surveillance procedures to utilize more accurate test equipment and retested the Salem Unit 2 EDGs. There is also a corrective action tracking document to assure Salem staff applies the corrective action for Salem Unit 1 EDGs as well.

M8.11 (Closed) LER 50-272/96-029 - surveillance test did not meet technical specification surveillance requirement. During a recent 18 month surveillance test on a hydrogen recombiner, a measurement of the heater and neutral to ground resistance indicated values below the acceptance criteria. The technicians questioned the test results because the recombiner had performed well during an operability test. An investigation revealed two things: 1) Technicians were not taking readings properly because of procedure inadequacies and, 2) Technicians took previous readings with a digital volt/ohm meter (DVOM) instead of with a meggar. The surveillance procedure does not direct using the DVOM, which if used may provide incorrect data.

The corrective action included a revision to the surveillance procedure to provide details for attaching test equipment, and general counseling of personnel to strictly follow procedures. The hydrogen recombiners were retested using the revised method and met the surveillance requirement.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Generic Letter 96-06 (GL 96-06) Modifications

a. Inspection Scope (37551)

Design engineering began installation of design change package (DCP) 2EC-3590 to address safety issues identified in GL 96-06 as they impacted the Salem Unit 2 containment fan cooler units (CFCUs) and attached service water system piping. The inspector evaluated the engineering organization's involvement in the installation of DCP 2EC-3590.

b. Observations and Findings

Design engineering did not allow sufficient time in the schedule for installation and testing of the CFCU modification. Despite schedule pressure, contract maintenance supervisors provided continuous and focused oversight of ongoing SW piping modifications to ensure personal safety and minimal impact of SW system operation. Salem maintenance supervisors, by contrast, provided little oversight of field installation.

Contract maintenance supervisors identified that technicians attached a portion of the new SW piping to the no. 21 SW header prior to proper hanger installation. Plant management promptly declared the associated SW header inoperable and disconnected the new section of piping. Maintenance supervision initiated a significance level 2 condition resolution report (970404205) to evaluate the cause and potential adverse affects of this problem.

The inspector observed that design engineers provided frequent engineering oversight at the job site, and quality assurance inspectors and operations senior nuclear shift supervisors conducted regulator field observations of the SW piping modifications.

c. Conclusions

Design engineering did not allow sufficient time for installation and testing of the CFCU modifications without adversely affecting the outage plan. Design engineers, quality assurance inspectors and senior nuclear shift supervisors provided frequent oversight of the installation.

E7 Quality Assurance in Engineering Activities

E7.1 Technical Specification Surveillance Improvement Program (TSSIP)

In NRC Inspection 50-272&311/96-15, the NRC requested that PSE&G provide justification for not completing TSSIP, Phase 2, prior to restart of Salem Unit 2. In

a letter to the NRC dated April 10, 1997, PSE&G provided a discussion of the TSSIP process, the accomplishments of Phase 1, and the results of FSAR, LER, and additional technical reviews. In the letter, PSE&G concluded that the multiple reviews and the corrective actions stemming from the reviews provided reasonable assurance the Salem Technical Specification Surveillances and implementing procedures are adequate to support restart. The inspectors concluded that PSE&G provided reasonable assurance the Technical Specifications and implementing procedures are adequate to support restart of Salem Unit 2.

E8 Miscellaneous Engineering Issues

- E8.1** (Closed) Violation 50-272&311/96-117-03013 and -04013: inappropriate corrective action. The technical issue involved the determination and resolution of nonconservative setpoint methodology with regard to the POPS. The programmatic issue involved the general failure of Salem staff's corrective action program. Together, these violations represented examples where management failed to implement timely corrective action, failed to promptly issue a Licensee Event Report for an operating condition outside the licensing basis, took credit in a calculation for an operating configuration outside the design basis, and took credit for an American Society of Mechanical Engineers (ASME) Code Case that the NRC had not yet approved for use. These violations were significant and resulted in civil penalties.

The NRC staff documented the review of the technical issue regarding acceptable POPS design basis in NRC Report 50-272&311/96-07, Section E8.4. Following NRR review and approval of proposed new limits, NRC staff closed the issue in NRC Report 50-272&311/97-02, Section E8.6.

Salem management addressed the programmatic issues regarding the corrective action program in the response to NRC Restart Issue III.a.10, Corrective Action Program. NRC staff documented the review and acceptance of the Corrective Action Program in NRC Report 50-272&311/97-03. Based on acceptable closure of the technical and programmatic issues related to these violations, the two violations are closed.

- E8.2** (Closed) Violation 50-272&311/96-117-06013: valve not properly positioned following a plant modification. In May 1993, plant personnel added drain lines and a drain valve to Pressurizer Overpressure Protection system piping. The installation process, however, did not ensure that operators properly positioned the drain valve following the modification. As a result, the valve remained closed (instead of open) from May 1993 until October 1994.

The inspector determined that operators have correctly positioned the valve and that Salem staff reviewed the valve alignment database to assure themselves no other similar examples existed. The inspector also verified that Salem staff revised SC.OP-AP.ZZ-0103(Q), *TRIS Configuration Control*, to address proper system alignment following design changes. The inspector reviewed this procedure and considered the process adequate. This violation is closed.

- E8.3 (Closed) LER 50-272/96-019 - misclassification of blowdown sample valves. In July 1996, while performing a review of 10 CFR 50 Appendix J valves, Salem staff identified four valves in the steam generator blow down sample system which were not included in the leak rate test program. A 1985 Licensing Change Request deleted the valves from the technical specifications and from the leak rate test program. Salem staff requested the change because they believed the valves were part of a closed system within containment and were therefore not required to be in the test program. However, during the July 1996 review, Salem staff determined that because the system was seismic Category II rather than Category I, the system is not a closed system.

The inspector reviewed the corrective action plan and found it adequate to address the issue. Also, this corrective action is documented in the Salem corrective action tracking system to assure completion. This licensee identified violation is being treated as a Non-Cited Violation consistent with Section VII.B.1 of the NRC Enforcement Policy.

- E8.4 (Closed) Violation 50-311/96-13-02: failure to follow procedures. During a recent inspection, an inspector found two examples where Salem staff failed to adhere to approved procedures. One example involved a field discrepancy that an operator identified and corrected, but did not result in anybody initiating a corrective action document. Another example involved a change made to a safety evaluation after Salem staff had approved the evaluation. The inspector reviewed the corrective action for the violation and found it to be satisfactory. In addition, the inspector noted that the generic issue of procedure compliance was addressed in the licensee's response to NRC Restart Item III.3, Procedure Use and Adequacy. Inspection Report 50-272&311/97-03 documented closure of that issue. This violation is closed.

- E8.5 (Closed) Violation 50-272&311/E94-112-01013: failure to promptly identify and correct the cause of spurious high steam flow signals. The spurious signals occurred during reactor/turbine trips on June 10, 1989, July 11, 1993, February 10, 1994 and on April 7, 1994.

There were two issues of concern regarding this violation. One was the technical issue of understanding the cause and implementing corrective action to resolve the spurious signal problem. Salem staff specifically addressed that issue in PSE&G's response to NRC Restart Issue II.38, Spurious High Steam Flow Signals Causing SI. The NRC staff is reviewing that information for acceptability. The second concern was the broader programmatic issue of timely and adequate corrective action and the general application of that program by PSE&G staff. Salem staff addressed that issue in PSE&G's response to NRC Restart Issue III.10, Corrective Action Program. NRC Inspection Report 50-272&311/97-03 documented the NRC review and closure of that issue and documented that the corrective action plans are adequate to support Salem restart. Since the NRC tracked the technical concern as a restart issue and has closed and documented the programmatic issue, this violation is closed.

E8.6 (Closed) Violation 50-272&311/96-08-04: failure of Salem staff to initiate a corrective action document in a timely manner. A team that reviewed temporary and permanent modifications installed at Salem identified conditions potentially adverse to quality. Salem staff, however, did not write a condition report to address the conditions until a month after the audit team exited. PSE&G staff addressed the broad issue of the corrective action program, including the prompt initiation of corrective action documents, in the response to NRC Restart Issue III.10, Corrective Action Program. NRC Inspection Report 50-272&311/97-03 documented NRC review and closure of that issue. Based on that closure, this violation is closed.

E8.7 (Closed) Violation 50-272&311/E95-117-02013: inadequate corrective action for No. 12 switchgear fan failure. In December 1994, No. 12 switchgear penetration area ventilation (SPAV) fan failed. In May 1995, No. 13 SPAV fan failed, resulting in the SPAV system being unable to perform its design function of cooling safety related switchgear. In the response to the violation, Salem management identified several contributing factors, including operator and engineering staff lack of knowledge of the SPAV system design basis.

For corrective actions, Salem staff repaired the fans; created additional preventive maintenance tasks for the fans; revised the Operability Determination procedure and the nuclear safety equipment and surveillance tracking procedure, and revised the corrective action program. The inspector reviewed the revised documents, including those that track surveillances for non Technical Specification equipment important to safety. This element of corrective action was satisfactory. Other elements of the violation response are satisfactory based on prior NRC closure of restart items that addressed the Corrective Action Program, Operability Determinations, and Operator Performance. This violation is closed.

E8.8 (Closed) Violation 50-272 & 311/E95-117-05013: Salem staff did not promptly identify and correct miscellaneous conditions adverse to quality. The violation identified nine examples where PSE&G failed to take appropriate corrective action for conditions adverse to quality. The conditions occurred during the period from 1990 until 1995.

The inspector reviewed PSE&G's response to this violation and found that for each example, PSE&G had implemented corrective action to resolve each condition. These examples represented failures of the Salem corrective action program, failures of operations operability determinations, and one failure to install a safety classified part. Since mid 1995, PSE&G has made significant improvements in plant programs as part of resolving NRC Restart Issues. Specifically, PSE&G has responded to NRC Restart Issue III.a.10, Corrective Action Program, Restart Issue III.6, Operability Determinations, and Restart Issue III.18, Parts Availability and Accuracy of Bill of Material. The NRC has reviewed PSE&G's response to these issues and has found the corrective actions adequate. The NRC has documented this in Inspection Reports 50- 272 & 311/96-08, /97-03, and /97-02, respectively. The inspector has reviewed the scope of those restart issues and found that they envelop the generic corrective action requirements for the nine examples of this violation.

Based on the review of the violation response, and the three closed restart issues, this violation is closed.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 External Exposure Controls

a. Scope (83750)

The inspector reviewed facility postings and high radiation area controls, reviewed RP instrument and respiratory protection controls, and reviewed dosimetry vendor changes during this inspection period. Tours of the facility, review of documents and interviews with licensee personnel were conducted.

b. Observations and Findings

The inspector verified that selected locked high radiation areas were locked as required and verified that the high radiation area key controls were in place and all keys were accountable. RP oversight of the primary RCA access control point was excellent. RP instrument and respiratory protection issue was provided through RP technicians utilizing computer review of qualifications for equipment issuance and accountability for the equipment issued. All RP equipment available for issuance was appropriately calibrated and source-checked as required.

Both Units 1 and 2 containments were well posted and radiologically controlled. The auxiliary buildings were, in general, appropriately posted and controlled. The inspector observed some discrepancies in the solid radwaste "hot" machine shop area, in that some lexan tent areas were posted in excess of actual radiological conditions. Tent number 1 had a shielded component on the floor with a radiation area posting on the door, but no other indication of the radiological hazard in the tent from the shielded component. Tents 2 and 3 were both posted as radiation areas, while a current survey indicated dose rates of less than 1 mR/hr. Further review indicated that the shielded component in Tent number 1 was an SJ valve that was last worked in June 1996. The licensee determined that the valve was waste material and was disposed of during the inspection. All three lexan tent areas were deposited in accordance with survey results.

Radiation Work Permits (RWPs) were written with an emphasis on restricting individual doses per entry with very low dose alarm set points used on electronic dosimetry. Typical values of 3-15 mrem alarm setpoints were used. Higher expected doses per entry involve ALARA prejob discussions prior to entry, resulting in customized setpoints based on specific work requirements.

Beginning April 1, 1997, the licensee began utilizing Pennsylvania Power and Light (PP&L) as a TLD processing vendor. The inspector verified that PSE&G had

conducted a QA audit prior to accepting the new vendor and that PP&L was a NVLAP-accredited laboratory in categories I-VIII. PSE&G continues to conduct a blind spike program by exposing 15 TLDs to a known exposure and submitting them to PP&L with each batch of personnel badges for quality assurance purposes. PSE&G continues to maintain responsibility and cognizance for personnel dosimetry processing and record dose determination processes.

c. Conclusions

The licensee provided excellent oversight of the RCA access control point and provides very effective exposure controls, limiting individual exposures to only necessary and expected values. Continued diligence is necessary to ensure accurate postings reflect survey results and for the timely removal of unnecessary radiological hazards. TLD vendor processing was properly reviewed by the licensee with appropriate quality control procedures implemented.

R1.2 Internal Exposure Controls

a. Scope (83750)

The inspector reviewed the bioassay measurement facility, reviewed applicable calibration and source check records, reviewed current internal exposure assessment results, licensee procedures, and interviewed licensee personnel.

Over the past 3 years, the licensee has maintained one whole body counter that utilizes sodium-iodide detectors for conducting bioassay measurements. Previous inspection reports have documented the complex of radionuclides present at both Salem and Hope Creek stations and questioned the capability of the sodium-iodide counter to accurately discriminate between these radionuclides. There have not been any recorded internal exposures during that time period, however, the capability for providing accurate measurements has been in question.

b. Observations and Findings

During this inspection, the inspector verified that the licensee's germanium detector whole body counter had been calibrated on March 13, 1997, sufficient to provide the radionuclide discrimination capability. The inspector observed that since vendor calibration in March 1997, daily source check counts of the germanium whole body counter had not been successfully obtained and, therefore, the instrument had not yet been put into service. The inspector determined that the whole body counter operator did not have the skills required to effect a successful fine gain adjustment on the germanium whole body counter.

The inspector reviewed whole body count records since the previous RP inspection in December 1996. Four positive whole body counts were documented, of which, only one reached an action level requiring repeat measurements and exposure assessment. Rapid radionuclide clearance from the body was appropriately assessed by the licensee as a gastro-intestinal deposition resulting in less than 10

mrem CEDE (procedures require recording at 50 mrem or greater). The inspector noted that the subject investigational whole body count was not recorded in the licensee's PREMS database system as required by procedure ND.RS-TI.ZZ-0403(Q), Rev. 3. When this discrepancy was identified, the licensee initiated an action report to evaluate and correct this issue. The inspector determined that since there was no exposure significance to this omission that this met the criteria for a non-cited violation.

The inspector reviewed the above mentioned procedure, "Evaluation of Bioassay Data," and observed that very limited guidance was provided for conducting an internal exposure assessment and no requirement for a peer review to verify calculations was provided.

c. Conclusions

The inspector determined that the licensee at both Salem and Hope Creek stations continues to conduct RP programs resulting in no recorded internal exposures. A 3-year issue regarding calibration of the licensee's investigational whole body counter has been recently resolved. Although recently calibrated, the investigational whole body counter has not been in service due to limitations in training of the operator. The Radiation Protection services supervisor stated that additional whole body counter training on the investigational whole body counter would be provided during 1997. The inspector also noted that the internal exposure assessment procedure lacked sufficient guidance relative to the conduct of internal exposure assessments. The Radiation Protection services staff indicated that procedure development was underway. The internal exposure assessment program is improving but some weaknesses in staff training and procedure adequacy remain.

R1.3 As Low As Is Reasonably Achievable (ALARA)

The inspector discussed with the licensee collective occupational exposure results for 1996 at Salem Station. A Salem Station exposure goal of 208 person-rem was established in late 1995 based on both units being returned to operation in February and June of 1996, as originally scheduled and without anticipating the replacement of steam generators in Unit 1. The licensee reported 209 person-rem for 1996 without including the Unit 1 steam generator replacement exposures. Inclusion of the 1996 Unit 1 steam generator replacement exposure (130.8 person-rem) resulted in a total of 340.3 person-rem for Salem station 1996 exposures. The steam generator replacement project was originally estimated to cost 166.5 person-rem, however, the estimate was revised upward to 232.9 person-rem in early 1997 due to additional steam generator support modifications, steam generator removal equipment modifications and outage schedule delays. Salem Station exposure estimates for 1997 are projected to be 30 person-rem plus 102.1 person-rem for completion of the Unit 1 steam generator replacement project. Current (as of April 21, 1997) 1997 exposure results are tracking within the goal at 17.7 person-rem and 85.6, respectively. In light of the short duration of planning the steam generator replacement project, exposures were well managed and controlled. The

Salem Station ALARA program for 1996 through this inspection period was found to be effective.

R6 RP&C Organization and Administration

R6.1 RP Organization Changes

a. Scope (83750)

The inspector reviewed the current RP staffing level of Salem Station commensurate with both units in extended outage conditions.

b. Observations and Findings

Individual reactor unit RP oversight was provided by specifically assigned RP supervisors. The 35 permanent RP technician workforce was expanded by 30 additional contractor RP technicians that were appropriately trained and qualified to provide the necessary radiological safety coverage. Inspector outage observations indicated adequate personnel resources were provided.

c. Conclusions

Salem Station RP staffing resources were appropriate during extended outage conditions of both Units.

R7 Quality Assurance in RP&C Activities

R7.1 RP Program Oversight

a. Scope (83750)

The licensee's QA organization was beginning a biennial RP program audit during this inspection and was, therefore, not reviewed. During this inspection, additional review of the RP corrective action process for identified problems was conducted, the program oversight provided by RP services (Section R8.1, UFSAR review) was reviewed, and the RP self-assessment program was reviewed. This review consisted of examination of selected licensee documents and interviews with applicable licensee personnel.

b. Observations and Findings

During a previous inspection¹, significant weakness was reported with respect to providing effective corrective actions for licensee-identified radiological problems. PSE&G correspondence to the NRC, dated February 6, 1997, addressed these concerns. The licensee indicated that a root cause manual was enhanced and that

¹ Inspection Report Nos. 50-272/96-17 and 50-311/96-17

the program now requires identification of a corrective action for each root cause or causal factor, or a justification when a corrective action is not specified for each root cause or causal factor. The licensee indicated that the improved corrective action process was implemented January 1, 1997, and indicated that an RP corrective action desk guide would be developed by March 31, 1997.

The inspector reviewed the following station corrective action program procedures:

"Action Request Process," NC.NA-AP.ZZ-0000(Q), Rev. 1
 "Corrective Action Program," NC.NA-AP.ZZ-0006(Q), Rev. 14
 "Radiological Occurrence Investigations," NC.RP-TI.ZZ-1001(Q), Rev. 0
 "Salem Radiation Protection Department Self Assessment/Corrective Action Program Desk Guide," Rev. 0

The licensee indicated that the improved corrective action program in the RP department was fully implemented by mid-February 1997, with some changes added in March 1997 to improve the thoroughness of handling radiological incidents. The inspector noted that while the program was implemented, insufficient information was available to assess effectiveness.

The action request process procedure designated level 1 events as: severe or unusual plant transients, safety system malfunction or improper operations, radiation in excess of limits, or severe injury. The corrective action program procedure provides root cause analyses for only Level 1 events with corrective actions associated with each cause to prevent recurrence of the event. Level 2 events were defined as conditions that do not have a significant impact on plant or personnel safety. The Level 2 events are assigned apparent causes and corrective action is assigned to resolve the conditions. For Level 2 events, assigning actions to prevent recurrence or to verify effectiveness was optional. In practice, Salem RORs are all designated as level 2 or 3 events, not requiring the identification of root causes and with no requirement for assigning corrective actions to each identified cause. In practice, however, the RP department has shown in recent results, that level 2 events are carefully considered with all causes identified and corrective actions assigned to each. Additional program guidance was contained in an RP department desk guide, which required a peer review and RPM review for each level 1 and level 2 event and specified that a corrective action be identified for each identified cause. The desk guide provided the additional program guidance necessary to effectively resolve radiological incidents.

The RP department has been conducting self-assessments since October 1995. The inspector reviewed RP self-assessment reports for the last 6 months. The inspector noted variable quality and value of these self-assessments.

c. Conclusions

The licensee's corrective action response letter of February 2, 1997 described actions taken for Level 1 events. RP incidents that do not result in exceeding

exposure limits (Level 2 and 3 events), do not require a root cause or corrective action review. The RP department has developed a desk guide to accomplish an improved review of level 2 events.

The RP department self-assessment program is beginning to provide some value, although the assessments continue to be of variable quality.

R8 Miscellaneous RP&C Issues

R8.1 Review of Updated Final Safety Analysis Report (UFSAR) Commitments

a. Scope (83750)

The inspector reviewed current Salem Station practices with respect to Section 12.4 of the UFSAR.

b. Observations and Findings

While performing the inspections discussed in this report, the inspector reviewed Section 12.4 of the UFSAR that related to the areas inspected. The following inconsistency was noted between the wording of the UFSAR and the plant practices and procedures observed by the inspector.

Within Section 12.4 entitled, "ALARA Program," the UFSAR lists the functions to be provided by the Principal Health Physicist-Radiological Safety, which include: ensuring periodic reviews of the ALARA program are conducted and providing periodic assessments of the station RP program.

The inspector reviewed documented results of the RP services group efforts over the last several years, and did not find significant evidence of periodic reviews of the ALARA program scheduled by RP services that were conducted, nor any evidence of periodic assessments of the Salem station RP program provided by RP services. Documents reviewed indicated that in late 1995, RP and ALARA program elements were scheduled for assessment by the RP services group over a 4-year time period, however, none of the subject assessments were conducted.

c. Conclusions

The UFSAR commitment discussed above is specified in licensee procedure NC.NA-AP.ZZ-0024(Q), Rev. 7, which states in Section 3.6 that, the Principal Health Physicist-Radiological Safety is responsible for ensuring periodic reviews of the ALARA program are conducted and is responsible for periodic, scheduled assessments of the station RP program with a frequency such that all functional activities are assessed at least every 4 years.

Contrary to the above, the Principal Health Physicist-Radiological Safety has not scheduled or provided periodic ALARA program reviews, nor RP program assessments for the past 4 years. The Principal Health Physicist-Radiological Safety

documented a business process action report on April 14, 1997, indicating that assessments of the RP program have not been systematically performed, however, no corrective actions had been taken at the time of this inspection. Considering the time period of omission and lack of results reviewed, this is considered a violation of RP procedures (50-272/97-07-02, 50-311/97-07-02).

S1 Conduct of Security and Safeguards Activities

a. Inspection Scope

Determine whether the security program, as implemented, met the licensee's commitments in the NRC-approved security plan (the Plan) and NRC regulatory requirements. The security program was inspected during the period of March 17-21 and April 14-17, 1997. Areas inspected included: previously identified items; protected area barriers and detection aids; alarm stations and communications; testing, maintenance and compensatory measures; training and qualification; organization and administration; quality assurance; and security and safeguards activities.

b. Observations and Findings

Appropriate corrective actions have been implemented to address previously identified weaknesses in the program. The alarm station operators were knowledgeable of their duties and responsibilities, and security training was being performed in accordance with the NRC-approved training and qualification plan. Protected area detection equipment satisfied the NRC-approved Physical Security Plan (the Plan) commitments, security equipment testing was being performed as required by the Plan, and maintenance of security equipment was being performed in a timely manner. Based on observations and discussions with security officers, the inspectors determined that they possessed the requisite knowledge to carry out their assigned duties and that the training program was effective.

c. Conclusions

The inspectors determined that the licensee was conducting its security and safeguards activities in a manner that protected public health and safety.

S2 Status of Security Facilities and Equipment

S2.1 Protected Area Barrier (PAB) and Detection Aids

a. Inspection Scope

Conduct a physical inspection of the PAB and intrusion detection systems (IDSs) to verify that the PAB satisfied the requirements of the Plan and the IDSs were functional, effective, and met licensee commitments.

b. Observations and Findings

On March 19, 1997, the inspectors observed the testing of the IDSs. However, the inspectors noted, during a walkdown of the PAB, that in several areas, the height of the PAB was below the requirements noted in the Plan. The inspectors determined, based on observations and discussions with security management, that the discrepancy was caused by gravel within the PAB washing against the fence during heavy rains. To correct the concern, the licensee committed to rake out all areas along the PAB where a height discrepancy was identified and include surveillance of the PAB as part of routine patrols.

c. Conclusion

On April 16, 1997, the inspectors determined by observation, that the actions taken by the licensee to correct the concern were adequate. The inspectors determined that the height of the PAB satisfied the requirements of the Plan and that the IDSs were functional and effective, and were installed and maintained as described in the Plan.

S2.2 Alarm Stations and Communications

a. Inspection Scope

Determine whether the Central Alarm Station (CAS) and Secondary Alarm Station (SAS): (1) are equipped with appropriate alarm, surveillance and communication capability; (2) are continuously manned by operators; and (3) include independent and diverse systems so that no single act can remove the capability for detecting a threat and calling for assistance, or otherwise responding to the threat, as required by NRC regulations.

b. Observations and Findings

Observations of CAS and SAS operations verified that the alarm stations were equipped with the appropriate alarm, surveillance, and communication capabilities. Interviews with CAS and SAS operators found them generally knowledgeable of their duties and responsibilities. However, on March 19, 1997, the inspectors noted during interviews that there was some confusion on the part of several of the CAS/SAS operators regarding when it was necessary to dispatch a responder to assess an alarm; however, the inspectors did not observe any problems with actual alarm responses. The concern was discussed with security management by the inspectors. To address the concern, the licensee agreed to reiterate the expectation concerning appropriate alarm assessment with all CAS/SAS operators during shift briefings. Additionally, the inspectors also verified through observations and interviews that the CAS and SAS operators were not required to engage in activities that would interfere with the assessment and response functions, and that the licensee had exercised communication methods with the local law enforcement agencies as committed to in the Plan.

c. Conclusion

The inspectors determined by discussions with the CAS/SAS operators on April 16, 1997, that the actions taken by the licensee to reiterate expectations concerning alarm assessment were effective. The determination was based on the CAS/SAS operators' responses to the inspectors' questioning. The CAS/SAS operators were knowledgeable of their alarm assessment responsibilities and the alarm stations and communications met the licensee's Plan commitments and NRC requirements.

S2.3 Testing, Maintenance and Compensatory Measures

a. Inspection Scope

Determine whether programs are implemented that will ensure the reliability of security-related equipment, including proper installation, testing and maintenance to replace defective or marginally effective equipment. Additionally, determine that when security-related equipment fails, the compensatory measures put in place are comparable to the effectiveness of the security system that existed prior to the failure.

b. Observations and Findings

The inspectors reviewed testing and maintenance records for security-related equipment and found that documentation was on file to demonstrate that the licensee was testing and maintaining systems and equipment as committed to in the Plan. However, the inspectors noted that the testing records of the access control search equipment did not indicate any equipment failures. On March 20, 1997, the inspectors observed testing of the metal detectors and noted that three of eight metal detectors failed the testing criteria. When questioning security management about the failures and lack of failures annotated on the equipment test records, the inspectors were informed that failures were not annotated on the test records for the access control equipment because normal practice was to have the instrumentation and calibration (I&C) department make the necessary repairs immediately upon notification of equipment failures. The inspectors stated that even though such a practice ensures timely repairs of the equipment, the lack of failures annotated on the test records eliminates the possibility of trending equipment reliability. The licensee agreed with the inspectors' rationale and stated that future equipment testing documentation would capture equipment failures. The inspectors noted that a priority status was being assigned to each work request and repairs were normally being completed the same day a work request necessitating compensatory measures was generated. The inspectors also noted that the working relationship between security, maintenance and the I&C departments was excellent as evidenced by the low number of open work requests related to security equipment during the review of maintenance records.

c. Conclusions

Documentation on file, reviewed April 16, 1997, confirmed that security equipment was being tested and maintained as required; however, failures of search equipment were not being documented in the test records. The licensee agreed to change its practice to allow for tracking and trending of equipment failures found during testing. Repair work was timely and the use of compensatory measures was found to be appropriate and minimal.

S5 Security and Safeguards Staff Training and Qualification

a. Inspection Scope

Determine whether members of the security organization are trained and qualified to perform each assigned security-related job task or duty in accordance with the NRC-approved Training and Qualification (T&Q) Plan.

b. Observations and Findings

On March 17, 1997, the inspectors met with the security training staff and discussed training initiatives associated with enhanced contingency response drills and tactical response training. The inspectors also observed classroom re-qualification training addressing the use of force, and determined that the instructor's presentation was good and that all course material was properly covered.

The inspectors randomly selected and reviewed T&Q records for fifteen security force members (SFMs) on April 15, 1997. Physical and firearms re-qualification records were inspected for armed and unarmed SFMs and security supervisors. The inspectors found that the training had been conducted in accordance with the T&Q Plan and was properly documented. Additionally, the inspectors observed weapons requalification training and determined that the training was conducted in accordance with the T&Q Plan and that the range was controlled in a safe manner.

Throughout the inspection, the inspectors interviewed a number of SFMs to determine if they possessed the requisite knowledge and ability to carry out their assigned duties.

c. Conclusions

The inspectors determined that training had been conducted in accordance with the T&Q Plan. Based on the SFMs' responses to the inspectors' questions and the inspectors' observations, the training provided by the security training staff was considered effective.

S6 Security Organization and Administration**a. Inspection Scope**

Conduct a review of the level of management support for the licensee's physical security program.

b. Observations and Findings

The inspectors reviewed various program enhancements made since the last program inspection, which was conducted in August 1996. These enhancements included the procurement of new weapons to enhance tactical response capabilities, new uniforms and web gear for the security officers, and the procurement of 17 new radios for communication enhancement. The inspectors reviewed the Manager - Nuclear Security's position in the organizational structure and reporting chain. The Manager - Nuclear Security reports to the Director - Nuclear Operations Services, who reports directly to the Senior Vice President - Nuclear Operations, who reports directly to the Chief Nuclear Officer and President - Nuclear Business Unit.

c. Conclusions

Management support for the physical security program was determined to be adequate. No problems with the organizational structure that would be detrimental to the effective implementation of the security and safeguards programs were observed or reported.

S7 Quality Assurance in Security and Safeguards Activities**S7.1 Effectiveness of Management Controls****a. Inspection Scope**

Determine if the licensee has controls for identifying, resolving and preventing programmatic problems.

b. Observations and Findings

The inspectors reviewed the licensee controls for identifying, resolving and preventing security program problems. These controls included departmental self-assessments and the performance of the NRC-required annual quality assurance (QA) audits. The licensee also utilizes industry data, such as violations of regulatory requirements identified by the NRC at other facilities, as criteria for self-assessment. The inspectors reviewed documentation applicable to the performance of the self-assessment program and noted that the self-assessment program was limited in scope. Specifically, 13 of 14 tasks developed to implement the program have been performed repeatedly for the past four years. Additionally, the results of the performed tasks have not been trended since October 1995. Even though self-assessment tasks are assigned and performed by security supervision on a weekly

basis, the inspectors questioned the effectiveness of the program with security management. The inspectors were informed by security management that a new self-assessment program was being developed and would be implemented in the near future.

c. Conclusions

The inspectors concluded that the self-assessment program in place to identify, prevent and resolve potential problems was weak and an improved self-assessment program would enhance program effectiveness.

S7.2 Audits

a. Inspection Scope

Review the licensee's QA report of the NRC-required security program audit to determine if the licensee's commitments as contained in the Plan were being satisfied.

b. Observations and Findings

The inspectors reviewed the 1996 QA audit of the security program, conducted May 6-17, 1996, (Audit No. 96-031). The audit was found to have been conducted in accordance with the Plan. To enhance the effectiveness of the audit, the audit team included two independent technical specialists. The audit report identified four weaknesses. The weaknesses were in the areas of vital area documentation, preventive maintenance for security equipment, closed circuit television improvements, and the identification of contraband by the security force member, during an audit drill. The weaknesses were not indicative of programmatic weaknesses but, if corrected, would enhance program effectiveness. The audit results had been disseminated to the appropriate levels of management. The inspectors determined, based on discussions with security management and a review of the responses to the weaknesses, that the corrective actions were effective.

c. Conclusions

The review concluded that the audit was comprehensive in scope and depth, that the findings were appropriately distributed and addressed and that the audit program was being properly administered.

S7.3 Adequacy of Security, NRC Restart Inspection Item III.24 (Closed)

All open items identified in previous inspection reports were reviewed and corrective actions were verified to be reasonable, complete and properly implemented. Security program implementation has been determined to be adequate to support restart.

S8 Miscellaneous Security and Safeguards Issues**S8.1 Review of Updated Final Safety Analysis Report (UFSAR)**

A recent discovery of a licensee operating its facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures, and parameters to the UFSAR description. Since the UFSAR does not specifically include security program requirements, the inspectors compared licensee activities to the NRC-approved physical security plan, which is the applicable document. While performing the inspection discussed in this report, the inspectors reviewed Section 4.2.2 of the Plan, titled "Vehicle and Cargo Control," the inspectors determined, based on discussions with security supervision and reviews of applicable procedures and records, that vehicles were being searched and controlled prior to entry into the protected area as described in the Plan and applicable procedures.

- S8.2** (Closed) Inspection Followup Item 50-272, 50-311, 50-354/93-28-01 - Review the effectiveness of assessment aids after upgrade is complete. The program to upgrade the assessment aids has been completed and the assessment aids were determined to be adequate to perform their intended function.
- S8.3** (Closed) Violation 50-272, 50-311/96-18-01, 50-354/96-10-03 - Failure to control badge/keycards and failure to display photo badges in the protected area. The inspectors verified the corrective actions described in the licensee's response letter, dated February 26, 1997, to be reasonable and complete and they were found to be properly implemented. No similar problems were identified.
- S8.4** (Closed) Violation 50-272, 50-311, 50-354/EA96-344-01013 - Failure to exercise positive access control over photo badge keycards thereby creating the opportunity for unauthorized access to the vital areas. The inspectors verified that corrective actions described in the licensee's response to letter, dated January 10, 1997, to be reasonable and complete and they were found to be properly implemented. No similar problems were identified.
- S8.5** (Closed) Violation 50-272, 50-311, 50-/EA96-344-02013 - Failure to conduct a physical pat-down search of a contractor that had caused two portal metal detectors to alarm on three different attempts to pass through them, although these alarms provided reasonable cause to suspect that the contractor was attempting to introduce firearms, explosives, incendiary devices, or other unauthorized material into the protected area, before issuing him a photo badge keycard, and allowing him to enter the protected area. The inspectors verified the corrective actions described in the licensee's response letter dated January 10, 1997, to be reasonable and complete and properly implemented. No similar problems were identified.
- S8.6** (Closed) Violation 50-272, 50-311, 50-354/EA 96-344-02023 - Failure to notify the senior nuclear shift supervisor (SNSS) of a security threat when a contractor that should have received a pat-down search entered the protected area without a pat-down search. The failure to notify the SNSS resulted in the event not being

classified per Event Classification Guide 16. The inspectors verified the corrective actions described in the licensee's response letter, dated January 10, 1997, to be reasonable and complete and properly implemented. No similar problems were identified.

- S8.7 (Closed) Violation 50-272, 50-311, 50-354/EA96-344-03014 - Failure to inactivate the security photo badges and personnel access clearance for 12 employees terminated in June and July 1996 within two working days of termination of employment. The inspectors verified the corrective actions described in the licensee's response letter, dated January 10, 1997, to be reasonable and complete and properly implemented.
- S8.8 (Closed) Violation 50-272, 50-311, 50-354/EA96-344-04014 - Failure of two security supervisors to qualify in all required critical security tasks prior to being assigned field operations supervisor duties. The inspectors verified the corrective actions described in the licensee's response letter, dated January 10, 1997, to be reasonable and complete and properly implemented. No similar problems were identified.
- S8.9 (Closed) Violation 50-272, 50-311, 50-354/EA96-344-05014 - Failure to complete all required tests of an alarm zone prior to releasing the security force member posted at the alarm zone. The inspectors verified the corrective actions described in the licensee's response letter, dated January 10, 1997, to be reasonable and complete and properly implemented. No similar problems were identified.

V. Management Meetings

X1 Exit Meeting Summary

Security inspectors met with licensee representatives at the conclusion of the inspection on April 17, 1997. At that time, the inspectors reviewed the purpose and scope of the inspection and presented the preliminary findings. The licensee acknowledged the preliminary inspection findings.

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on May 7, 1997. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

INSPECTION PROCEDURES USED

IP 37751: Onsite Engineering
IP 61726: Surveillance Observations
IP 62707: Maintenance Observations
IP 71707: Plant Operations
IP 71750: Plant Support
IP 81700: Physical Security Program
IP 83750: Occupational Radiation Exposure

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-311/97-07-01 VIO failure to establish containment integrity within eight hours with only one operable AC electrical bus train while in mode 5 (Cold Shutdown)

50-272,311/97-07-02 VIO Failure of RP Services to provide periodic RP program and ALARA program assessments.

Closed

50-272&311/EA94-239-01012,
EA96-177-01012 & 50-272&
311/EA96-177-01022 VIO discrimination against employees engaged in protected activities as designed in 10 CFR 50.7 (a)(1)

50-272&311/EA94-112-01013 VIO failure to promptly identify and correct the cause of spurious high steam flow signals

50-272&311/94-01-01 URI control of maintenance troubleshooting

50-272&311/94-24-01 VIO failure to ensure containment integrity

50-272&311/95-12-01 VIO inadequate corrective action for ITE circuit breaker problems

50-272&311/EA95-117-02013 VIO inadequate corrective action for #12 switchgear fan failure

50-272&311/EA95-117-05013 VIO Salem staff did not promptly identify and correct miscellaneous conditions adverse to quality

50-272&311/EA96-117-03013&
04013 VIO inappropriate corrective action

50-272&311/EA96-117-06013 VIO valve not properly positioned following a plant modification

50-272&311/96-07-02 VIO violation of TS 6.8.1 requirements

50-272&311/96-08-04 VIO failure of Salem staff to initiate a corrective action document in a timely manner

50-311/96-13-02 VIO failure to follow procedures

50-272&311/96-15-01 VIO corrective action for operator performance problems

50-272&311/96-16-02	IFI	improperly coded corrective action documents
50-272/96-019	LER	misclassification of blowdown sample valves
50-272/96-021	LER	potential common mode failure for 28V DC battery chargers due to molded case circuit breaker damage
50-272/96-025	LER	inadequate calibration of overpower delta temperature protection channels
50-272/96-027	LER	diesel watt meter inaccuracies not accounted for in surveillance testing
50-272/96-029	LER	surveillance test did not meet TS surveillance requirement
50-272/96-041	LER	missed surveillance for radiation monitors source check
50-311/96-011	LER	missed surveillance for sampling boron concentration of refueling canal
50-311/96-012	LER	ESF actuation, 2A 4kv vital bus undervoltage
50-311/96-013	LER	missed surveillance for performing tritium grab samples when the refueling canal was flooded
50-311/96-014	LER	emergency diesel generator automatic start
50-311/96-015	LER	breach of containment closure during core reload
50-311/96-016	LER	missed surveillance for determining response time of high containment gaseous radioactivity ESF actuation

Discussed

LIST OF ACRONYMS USED

ALARA	As low as is reasonably achievable
ASME	American Society of Mechanical Engineers
CAS	Central Alarm System
CCTV	Closed Circuit Television
CRO	Control Room Operator
DCP	Design Change Package
DVOM	Digital Volt/Ohm Meter
EDG	Emergency Diesel Generator
FME	Foreign Material Exclusion
IDS	Intrusion Detection Systems
NRC	Nuclear Regulatory Commission
OHA	Overhead Annunciator
OSR	Onsite Safety Review
PA	Protected Area
PDR	Public Document Room
PEO	Plant Equipment Operator
PMCRs	Preventive Maintenance Change Requests
POPS	Pressurizer Overpressure Protection System
PREMS	Personnel Radiation Exposure Management System
PSE&G	Public Service Electric and Gas
RCA	Radiological controlled area
RHR	Residual Heat Removal
RP	Radiation Protection
QA	Quality Assurance
SAS	Secondary Alarm System
SEC	Safeguards Equipment Cabinet
SFM	Security Force Members
SPAV	Switchgear Penetration Area Ventilation
SRG	Safety Review Group
T&Q	Training and Qualification
the Plan	NRC-approved Physical Security Plan
TLD	Thermoluminescent dosimeter
TS	Technical Specification
TSSIP	Technical Specification Surveillance Improvement Program
UFSAR	Updated Final Safety Analysis Report