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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

SALEM NUCLEAR GENERATING STATION

NOVEMBER 7, 1983

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I. INTRODUCTION

1. Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect observations on an annual basis and evaluate licensee performance based on those observations with the objectives of improving the NRC Regulatory Program and licensee performance.

The assessment period for this report is October 1, 1982, through September 30, 1983. This assessment also contains references to significant information which occurred prior to the assessment period as appropriate.

The prior SALP assessment period was September 1, 1981, through August 31, 1982. Significant findings of the assessment for the previous period are provided in Section IV below.

Evaluation criteria used during this assessment are discussed in Section III. Each criterion was applied using the Attributes for Assessment of Licensee Performance contained in NRC Manual Chapter 0516.

2. SALP Attendees:

Board Members:

R. W. Starostecki, Director, Division of Project and Resident Programs (DPRP)
H. B. Kister, Chief, Projects Branch 2, DPRP
R. R. Bellamy, Chief, Radiological Protection Branch, DETP
J. H. Joyner, Chief, Nuclear Materials and Safeguards Branch, DETP
L. J. Norrholm, Chief, Reactor Projects Section 2B, DPRP
D. Fischer, Licensing Project Manager, ORB 1, NRR
J. Linville, Senior Resident Inspector, Salem Units 1 & 2
S. Varga, Chief, Operating Reactors Branch 1, NRR

Others:

R. J. Summers, Resident Inspector, Salem Units 1 & 2
L. E. Tripp, Chief, Reactor Projects Section 3A, DPRP

3. Background

3.1. Licensee Activities

Unit 1

Unit 1 operated at 100% until it was shut down for refueling on October 15, 1982. The outage was originally scheduled as a 10 week shutdown to replace approximately one-third of the core and to complete various modifications and maintenance items, which included: a permanent source of alternate supply 125 VDC control power to the Emergency Diesel Generators; installation of a post-accident sampling system; completion of additional radiation monitoring device installation in accordance with the TMI action plan items for high range plant vent monitoring and main steam line monitoring; and, modifications to various coolers throughout the plant to replace or repair degraded tube material in the Service Water System.

During the outage, a number of unscheduled activities severely impacted on the schedule. These activities included: repair to the service water pipe associated with No. 12 Component Cooling Heat Exchanger due to weld degradation; repairs to the BIT injection valves (SJ4 and 5); and replacement of the faulted No. 12 Reactor Coolant Pump motor. Following these repairs, the unit was made ready for start-up and testing. The reactor was made critical on February 14, 1983, and commenced physics testing, secondary side heat up and Steam Generator Code Safety Valve tests. The unit was synchronized on February 22 and continued escalated power physics testing, when, on February 22, a plant trip occurred. While in the process of transferring "house" loads from the Station Power Transformers to the Auxiliary Power Transformer, 4KV Group Bus 1F failed to transfer.

This resulted in the loss of all operating equipment on the bus. After assessing the unit status, the Shift Supervisor ordered the plant tripped. The operator manually tripped the reactor. Within minutes from the initiating event, not only had 1F bus de-energized, but also No. 11 Reactor Coolant Pump (RCP) had tripped, a Safety Injection had occurred due to steam line differential pressure, and both Pressurizer Power Operated Relief Valves had opened to mitigate the resulting pressure transient with both pressurizer spray systems inoperable since Nos. 11 and 13 RCS loops had no forced flow. Once the unit was brought to a steady state condition, the licensee focused attention on correcting the obvious problems in support of plant start-up. The unit was made critical on February 23, and power escalation continued on February 25.

On February 25, 1983, with the unit at 12% power, an alarm actuated indicating a reactor trip due to a low-low water level condition in one of the steam generators. Operators had previously noted the water level approaching the reactor trip setpoint and had initiated corrective measures. When the alarm occurred, however, no reactor trip occurred. Operators verified this and then verified the alarm was valid by observing the indicated level instruments. Approximately 30 seconds after the alarm, the reactor was manually tripped. The licensee immediately initiated an investigation which confirmed that an ATWS had occurred.

On February 26, 1983, during initial fact-finding questioning by the NRC regarding the reactor trip on February 22, PSE&G assessed the Sequence of Events printout for the February 22 event and determined that an ATWS had also occurred on that occasion. PSE&G indicated that it was initially overlooked because it had been obscured by the prompt operator actions and the complexity of the ensuing transient.

The occurrence of the two ATWS events focused much NRC, industry, media and public attention upon PSE&G. Two documents, NUREG-0977, "NRC Fact-Finding Task Force Report on the ATWS Events at Salem Nuclear Generating Station, Unit 1, on February 22 and 25, 1983," and NUREG-1000, "Generic Implications of ATWS Events at the Salem Nuclear Power Plant," explain the occurrences, causes, and implications of the Salem ATWS events. In addition, NUREG-0955, "NRC Safety Evaluation Related to Plant Restart for Salem Nuclear Generating Station Unit Nos. 1 and 2," documents the specific near and long term corrective action program undertaken by PSE&G and accepted by the Commission as necessary for continued safe operation of the facility. The various remedial actions involve equipment, operational and management issues. The equipment issues involve: (1) safety classification of breakers, (2) identification of cause of failure, (3) verification testing, and (4) maintenance and surveillance procedures. The operational issues involve: (1) operating procedure for reactor trips and anticipated transients without scram (ATWS), (2) operator training, and (3) operator response. The management issues involve: (1) master equipment list, (2) procurement procedures, (3) work order procedures, (4) post-trip review, (5) timeliness of event notification, (6) updating vendor-supplied information, (7) involvement of QA personnel with other station departments, (8) post-maintenance operability testing, and (9) overall management capability and performance.

Because of these deficiencies, the facility remained shutdown from February 25, until May 20, 1983, by which time short term corrective actions were developed, implemented, and verified, and long term corrective actions were developed. The licensee

was issued an order to implement and/or maintain these corrective actions and, in addition, an $850,000 civil penalty was imposed for the related violations.

Following completion of all near term corrective actions and a review of maintenance activities to confirm operability of all systems and components required by Technical Specifications, Unit 1 commenced a heat up and was critical on May 20, 1983, and, after delays caused by secondary plant problems, was synchronized with the grid on May 21. Power ascension to 100% was attained on May 27, after completing tests in accordance with the post-refueling start-up test schedule which had not yet been completed prior to the ATWS events in February 1983.

After completing power ascension on May 27, Unit 1 continued to operate at a nominal 100% power for the remainder of the assessment period except for short outages following reactor trips that occurred on August 11 and 22, and September 9 and 21.

Unit 2

Unit 2 was operating at a reduced power level at the beginning of the assessment period because Steam Generator Code Safety Valve 23MS15 was gagged closed as a result of premature actuations experienced during July 1982.

On January 6, 1983, a reactor trip occurred in which the "A" Reactor Trip Breaker (RTB) failed to open as required. The failed RTB was replaced by a Unit 1 RTB and the unit restarted.

Routine operations continued until January 21, 1983, when the unit was shut down for the first refueling outage. During the cycle, the unit had experienced continual service water leaks into containment from the Containment Fan Coil Units (CFCUs). Most leaks were 1 gpm or less and usually occurred on a cooling coil. A total of ten such leaks occurred during the assessment period; however, all were experienced prior to the refueling outage. During the refueling outage, a modification was completed replacing all CFCU coils with new coils constructed of a different material type more resistant to the corrosive effects of service water. No CFCU leaks occurred after the modification, and, in addition, no such leaks have occurred on Unit 1 since April 1982, when a similar modification on that unit was completed.

Major activities during the outage were: to replace approximately one-third of the fuel in the core; to complete many TMI Action Plan modifications required by license conditions; to re-tube the main condensers; and to conduct a Containment Integrated Leak Rate Test (CILRT). Many of these activities were impacted by the extensive investigation(s) conducted as a result of the two ATWS events experienced by Unit 1 in late February.

On July 23, 1983, the unit was restarted following the first refueling outage. Post refueling core physics tests were completed and the unit was synchronized July 29. The majority of the post refueling testing was conducted from August 1-11, 1983.

The unit tripped on July 27, 29, and 30, August 1, 11, and 19, and was manually shut down, after the assessment period, on October 7, 1983. Most trips occurred from low power during the first refueling start-up testing phase.

Following return to service, outages were required to replace a failed Intermediate Range (IR) neutron detector; to repair leaks in the generator stator cooling water system; and to modify the low temperature pressurizer overpressure protection system (POPS). The first of these outages lasted five days to replace the IR

detector. The second outage lasted approximately five weeks to work on the generator and the POPS. The unit was returned to service on September 24, 1983.

Site

A full-scale Emergency Plan exercise was conducted on October 13, 1982. The Institute of Nuclear Plant Operations (INPO) conducted an on-site evaluation October 4-15, 1982.

In January 1983, a reorganization of Quality Assurance changed overall QA (Nuclear) reporting responsibilities to the Vice President - Nuclear Department. On April 18, 1983, a reorganization within the Nuclear Department resulted in appointment of a new General Manager - Salem Operations. As a result of the ATWS events, both Basic Energy Technology Associates (BETA) and Management Analysis Company (MAC) conducted on site evaluations of Nuclear Department effectiveness.

3.2 Inspection Activities

Two resident inspectors were assigned to the site for the entire assessment period. During August 1983, one resident was replaced.

Total NRC inspection hours: 3713 (Resident and Region-based). Distribution of Man-hours is shown in Table 2. Inspection activities included a special Task Force review of the ATWS events in March 1983.

Table 3 summarizes inspection activities. Violations and enforcement data are tabulated in Table 4.

II. SUMMARY OF RESULTS

FUNCTIONAL AREAS	SALEM NUCLEAR GENERATING STATION CATEGORY 1	CATEGORY 2	CATEGORY 3
1. Plant Operations			X
2. Radiological Controls • Radiation Protection • Radioactive Waste Management • Transportation • Effluent Control and Monitoring		X	
3. Maintenance		X	
4. Surveillance (Including Inservice and Preoperational Testing)		X	
5. Fire Protection and Housekeeping		X	
6. Emergency Preparedness	X		
7. Security and Safeguards		X	
8. Refueling/Outage Activities	X		
9. Licensing Activities		X	

OVERALL SUMMARY

While PSE&G appears to have a technically knowledgeable staff and management, the detailed investigations of the February 22 and 25, 1983, ATWS events identified several management, technical, and operational issues which required resolution and corrective action. Many of these issues have implications in several of the functional areas detailed in Section IV of this assessment, including: Plant Operations, Maintenance, Surveillance, Emergency Preparedness and Licensing. However, the common factor linking these issues appears to be an attitude problem on the part of some staff. This concern is evidenced by violations which resulted in some part because of a lack of inquisitiveness or lack of personal accountability. Increased supervisory involvement and direction to provide an integrated philosophy of operations and safety inquisitiveness appears warranted. Additional PSE&G management attention is needed to foster more effective interdepartmental and intradepartmental communication and coordination. The reliance of some plant personnel on someone else to successfully complete tasks or resolve problems appears to be an underlying issue. Because this problem is indicated in several functional areas, it has been addressed predominately in the discussion of overall plant operations. In summary, PSE&G has initiated many improvements to create an augmented on-site organization, including extensive support staff. Favorable results can be expected as the organization is developed into an integrated and cohesive team.

III. CRITERIA

The following evaluation criteria were applied to each functional area:

1. Management involvement in assuring quality.
2. Approach to resolution of technical issues from a safety standpoint.
3. Responsiveness to NRC initiatives.
4. Enforcement history.
5. Reporting and analysis of reportable events.
6. Staffing (including management).
7. Training effectiveness and qualification.

To provide consistent evaluation of licensee performance, attributes associated with each criterion and describing the characteristics applicable to Category 1, 2, and 3 performance were applied as discussed in NRC Manual Chapter 0516, Part II and Table 1.

The SALP Board conclusions were categorized as follows:

Category 1: Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used such that a high level of performance with respect to operational safety or construction is being achieved.

Category 2: NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective such that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3: Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appeared strained or not effectively used such that minimally satisfactory performance with respect to operational safety or construction is being achieved.

IV. Performance Analysis

1. Plant Operations (41.1%)

This analysis includes operational activities and operational support activities. The area was under continual review by resident and region-based inspectors, and regional and headquarters management during the assessment period with inspections covering the following areas: compliance with license and procedural requirements, quality assurance, committee activities, reporting systems, and audits. In addition, extensive inspection and management effort was devoted to review of the February 22, 1983, and February 25, 1983, ATWS events including the fact-finding Task Force, the Restart SER, and several management meetings.

During the previous assessment, the most significant weakness identified was a lack of communications and coordination between the site staff and the engineering support organization. While this weakness appears to persist, improvements have been noted in this specific area and are discussed later in this section. The percentage of inspection effort was considerably larger during the previous assessment period (56.4%) because of the 24-hour coverage provided during the six week strike.

Investigation of the February 22 and 25, 1983, ATWS events revealed serious deficiencies in the overall management of Salem operations. These deficiencies permeated the organization and, therefore, symptoms arose in many areas supporting plant operations. This could not be attributed to any single entity, rather, an attitudinal problem is perceived, the symptoms of which include poor interdepartment and intradepartment communications, failures of management to follow-up on completion of assigned tasks at all levels, failures to thoroughly investigate events and develop corrective actions which address their root causes, and the lack of cooperation and coordination to foster a team approach both to the conduct of routine operations and to the resolution of complex problems within and between departments.

The licensee's response to the August 20, 1982, failures of the Unit 2 B Reactor Trip Breaker (RTB) illustrates this attitude. Had the failure been thoroughly investigated, the potential for common mode failure of RTB undervoltage (UV) coil trip attachments caused by inappropriate preventive maintenance could have been recognized and the ATWS events could have been prevented. Instead, the failure was treated as a simple component failure for which the component was replaced and retested without further analysis and without detailed evaluation to assess the safety of continued operations.

As a result, the NRC investigation of the ATWS events showed that the organization was insufficiently inquisitive to prevent and detect problems. Although the necessary staffs and procedures were available for safety-related maintenance, "tools" such as a controlled and verified Master Equipment List (MEL) of safety-related components and vendor-specified maintenance requirements were insufficient. In addition, while the licensee had staffed the required review organizations, the detection capabilities were questionable since: (1) QA did not review work order classifications to prevent misclassifications like those on the RTBs; (2) post-maintenance testing requirements were not controlled to assure system operability in all cases following maintenance activities; and (3) perhaps most importantly, no formal review was required after a plant transient, such as a reactor trip, to assess the operation(s) of safety-related equipment.

In response to a long term corrective action item, the MAC management diagnostic and QA assessment, a PSE&G action plan was developed and submitted to the NRC. Through the NRC augmented inspection program, the plan was found to lack detail and a means for measuring progress toward completion of the action items. At a meeting held after the assessment period on October 11, 1983, PSE&G indicated that milestones were under development and were expected to be complete soon. However, top PSE&G management seemed vague about the mechanism to monitor or measure progress toward the completion of these milestones.

Since the reorganization and move to the site from Newark during the previous assessment period, the development of a Nuclear Department policy and procedure manual has been slow, although some procedures have been issued within the last few months. After the ATWS events, management changes were made which appear to have contributed to improved management attention, understanding, and control of plant operations activities.

Since the Nuclear Department was organized to include engineering support personnel on site, engineering support of plant operations concerning resolution of technical issues appears to be improving. This is evidenced by the presence of engineering representatives at morning station management meetings, the presence of engineers on site working with station personnel to resolve technical issues and the implementation of engineering resolutions to technical issues like leaking containment fan cooler units and inadvertent actuations of safeguards equipment cabinets. In spite of these improvements, many longstanding technical issues remain to be resolved such as problems with containment airlock seals, implementation of design changes to prevent failure of BIT inlet valves to open on a safety injection signal, failures of auxiliary steam supply check valves, and evaluation of vital heat trace surveillance acceptance criteria and technique.

In addition to the $850,000 civil penalty assessed for the deficiencies identified by the ATWS investigation, another civil penalty was assessed in this area for a violation of a limiting condition for operation involving a capped sensing line which made the containment/plant vent monitors inoperable. This was caused by a lack of management control of the design change/modification process. It also demonstrated that the quality control verification process to ensure proper installation and the acceptance testing to demonstrate system operability, were inadequate.

There were also three other LCO violations. These involved: 1) improper blanking of the reactor coolant system vent path when the pressurizer overpressure protection system (POPS) was inoperable; 2) two examples of operation with less than the required number of AC electrical bus trains and associated diesel generators operable without establishing containment integrity within the required time due to inadequate preplanning; and 3) changing of operational modes while relying on provisions of action statements for containment integrity and containment isolation valve LCOs when the containment service air manual isolation valve was inadvertently left open due to personnel oversight. These LCO violations represent examples of poor planning, coordination and control of operating activities by licensed first line supervision to assure compliance with Technical Specification requirements.

Three other problems were identified which involved failure to follow valve alignment and tagging procedures including improperly tagging the motor controller for the accumulator block valves in the wrong unit, incorrect positioning of the ECCS throttle valves, and failure to include two new valves in the auxiliary feedwater system Tagging Request and Information (TRIS) valve line up list. These examples demonstrate inadequate verification and follow-up of activities performed by field operators, control room personnel, and staff support personnel. Two additional events also represented significant operations inadequacies. LERs 50-311/83-36/01T and 83-34/03L document events involving an inoperable Cold Leg Accumulator and the loss of containment integrity respectively. On both occasions, personnel error or oversight again was the cause. The ECCS throttle valve violations and the two referenced LERs had the potential for being LCO violations except for immediate corrective action taken after each of the occurrences were identified by NRC inspectors. Collectively, these events and violations represent a continuing lack of control of station activities and inattention to detail with regard to some Technical Specifications and procedural requirements which require further remedial action by management.

While the quality of reports, both written and verbal, is generally very good, particularly in the areas of event description and cause analysis, some reports have not been timely or the corrective actions have not been adequate. Untimely 10 CFR 50.72 reports were included

in the ATWS civil penalty. Due to the licensee's incorporation of 50.72 reporting requirements into the Station Emergency Plan (EP), notifications are made in accordance with the appropriate EP checklist. As a result of inadequate management involvement and attention to detail, the development of implementing procedures with inappropriate priorities for emergency notification of the NRC was permitted. Steps have been taken since the violation to correct this, but it appears that the best corrective action has been the increased awareness in the Operations Department to meet 50.72 requirements. Another violation cited several examples of failure to submit licensee event reports within the required time. With respect to supplemental reports, there is a tracking system to ensure supplemental reports are submitted, but limits are not established to ensure that these reports are generated within a reasonable amount of time. Causal analysis of LERs has shown that almost one-third of all events are caused by personnel errors or procedural errors. Both of these factors should be able to be reduced with sufficient attention to detail.

Management initiative to move experienced operating personnel to other departments to provide a valuable operational perspective has been helpful in improving interdepartmental and intradepartmental communications and planning. However, this has also had, at least in the interim, a detrimental diluting effect on the overall operations department experience level which appears to have been a contributing factor to the increased number of Technical Specification LCO violations. The reorganization and move of the Quality Assurance department from Newark to the site in January 1983 has created some staffing problems in that department also. Some of the shortage created by refusal of some individuals to relocate has been made up with contractor personnel.

While the training program remains well defined and implemented in general, new programs are being developed and implemented which should be helpful in correcting the experience and staffing problems noted above. These include a new Quality Assurance training program, and new programs for training and retraining both first level and senior supervisory personnel. Selected topics in the supervisory training programs should also be helpful in developing appropriate attitudes which should aid in reducing the number of violations of Technical Specifications and procedures noted in the enforcement discussion above.

In summary, completion of the long term initiatives developed in response to the identified ATWS deficiencies should serve to markedly improve the PSE&G Nuclear Department organization. However, to realize this improvement, management must demonstrate a stronger commitment and provide firmer direction to ensure deadlines are met and the desired results are achieved. Instead of relying on the good

intentions and dedicated efforts of individuals to assure safe operation, PSE&G management must develop and implement a sound safety-oriented operating philosophy which a) promotes effective interdepartmental and intradepartmental communications, b) fosters thorough investigation of and comprehensive corrective action for problems with potential safety significance, and c) emphasizes the importance of verification and follow-up of routine operating activities to minimize personnel errors.

Conclusion

Category 3

Board Recommendations

Monitor licensee efforts to overcome attitudinal problems through continued implementation of the augmented inspection program.

2. Radiological Controls (13.1%)

There were seven inspections performed in the area of Radiological Controls during the assessment period. The resident inspectors reviewed ongoing radiological controls activities. One report of a receipt inspection by a state representative at the disposal site was received for review. Certain of these inspections examined several program areas including Radioactive Waste Management, Effluent Monitoring, and Control and Transportation.

The Radiological Controls Program at the Salem Station is common to both operating units and is conducted under the same management supervision. The inspections during this assessment period indicated the program was uniformly implemented at each unit.

Eleven violations and one deviation were identified in the area of Radiological Controls. These are further discussed in this analysis.

2.1 Radiation Protection

Five inspections of this program were conducted by Region I Radiation Specialists. This included a special inspection to review an April 16, 1983, Unit 2 airborne radioactivity event, and a special Radiation Protection Team Inspection of radiological controls at Units 1 and 2. The resident inspectors reviewed ongoing radiation protection activities.

During the special team inspection of this program area, a number of programmatic deficiencies requiring licensee attention were identified. The review of the radiation protection organizational structure indicated that the structure was not consistent with existing station administrative procedures since three new supervisory level positions in the organization were not described or identified. As a result, neither job descriptions nor task analyses existed for these positions. Two of the positions had existed and were staffed for about two years while a third position was relatively new and was being temporarily filled by a fourth supervisor responsible for other programmatic areas. The licensee committed to review, in a timely manner, appropriate procedures to properly reflect current station organization and operations.

The review of the training and staffing of the Radiation Protection organization indicated the licensee has staffed the organization with individuals who received adequate initial training and qualification. This included those contracted radiation protection personnel used to augment the organization during outages. In addition, technical training was provided to upgrade the technical abilities of radiation protection personnel as appropriate. The review indicated that the licensee's retraining program for

licensee radiation protection personnel was not adequately defined. The retraining program did not assure that the appropriate individuals received training in new procedures and procedure changes in that this aspect was not formalized. The licensee committed to provide timely training for appropriate members of the Radiation Protection organization in the backlog of new procedures and procedure revisions.

The review of the licensee's quality assurance program, as it relates to the Radiation Protection Program indicated the licensee was performing audits in accordance with license requirements. However, audit reports were not being transmitted in a timely manner to the management individual responsible for the area audited. The licensee has taken action to preclude recurrence of this problem. The licensee's corporate Radiaton Protection Services Group is performing audits of the Radiation Protection Program. The audits were performed by technically qualified personnel and were comprehensive. However, a corrective action system had not been established for resolution of the corporate group's findings. The licensee committed to establish a system in a timely manner. A Confirmatory Action Letter was issued to document licensee corrective actions for deficiencies identified during the team inspection.

The licensee's Radiation Protection facilities and equipment were adequate to support normal operations. Reviews of licensee posting and access control of Radiation and High Radiation Areas, and control of radioactive and contaminated material indicated the licensee was adequately and effectively posting and controlling these areas and material.

A comprehensive review of the licensee's As Low As Reasonably Achievable (ALARA) Program was performed. The licensee used mock-up training to train steam generator workers during a special inspection in April 1983. An airborne radioactivity event in Unit 2 indicated that the licensee established adequate engineering controls to minimize airborne radioactivity during steam generator work. However, as a result of ineffective communications between the licensee's Radiation Protection and Operations staffs and inadequate procedural controls, the installed engineering controls (Iodine Removal Units) were not used during a portion of the work. As a result, a number of individuals sustained intakes of airborne radioactive material. The review of the ALARA Program, during the special team inspection, indicated that significant aspects of the ALARA program had not been established, including a complete description of the responsibilities and authorities of all personnel involved in ALARA, procedures for long term ALARA reviews and procedures for ALARA review of design changes and modifications. In addition, there was no effective measurement system to determine the degree

of success of the ALARA program. The licensee has committed to formally establish the program in a timely manner and has retained a contractor to assist in this area.

Salem Units 1 and 2 sustained a site total of 1203 man-rem for 1982. This is an average of 601 man-rem per unit. This compares favorably with the national average man-rem exposure per unit at PWRs for 1982 of 578 man-rem.

In summary, the team inspection of this area revealed a number of programmatic weaknesses, particularly the lack of a comprehensive ALARA program. In the past, the license has relied on the efforts of conscientious individuals to avert serious potential problems posed by these programmatic weaknesses. However, changes in personnel assignments and experience levels have the potential to negate this compensating factor. In addition, the personnel uptakes associated with the Unit 2 steam generator work had the potential for much more serious consequences. It is important that licensee management follow through on the committed corrective actions for these programmatic deficiencies to lessen the potential for more serious events. Management emphasis must also be placed on adherence to procedures and the development of improved program implementing procedures.

2.2 Radioactive Waste Management

Two inspections of this area were conducted by Region I Radiation Specialists.

The inspections conducted during the period did not identify any deficiencies. The licensee appears to be implementing an effective Radioactive Waste Management Program.

2.3 Transportation

Two on site inspections of this program were conducted by Region I Radiation Specialists. One inspection by a state representative of a licensee waste shipment was reviewed. NRC Region I issued a Notice of Violation based on an inspection conducted by the state representative in January 1983, which identified a lack of effective bracing of a licensee radioactive waste shipment received at the burial site. The State of Washington issued a warning to the licensee. An additional concern was identified involving the adequacy of the licensee's quality assurance program for transport packages during the assessment period. This issue is currently unresolved pending review and clarification of requirements by NRC headquarters staff.

During a routine transportation inspection performed in June 1983, the licensee's corrective actions for the bracing violation were found adequate and effective.

The review of the licensee's radioactive waste transportation organization indicated the organization is part of the in-plant radiation protection organization. The review indicated that the position of Technical Supervisor - Radioactive Waste was not described in the licensee's administrative procedures for the station organization as discussed in section 2.1.

No other programmatic weaknesses were identified. The licensee is implementing a generally adequate and effective Radioactive Waste Transportation Program.

2.4 Effluent Monitoring and Control

One inspection of this program area was conducted by Region I Radiation Specialists. The resident inspectors also reviewed this program area.

During this assessment period, the licensee experienced problems with process and effluent radiation monitoring systems (RMS) and experienced a number of unplanned spills of radioactive liquid. The licensee provided generally timely reports of these problems in accordance with regulatory requirements. However, three of the problems with process and effluent RMS resulted in violations.

The licensee's review of the problems identified a number of deficiencies. These included: failure to collect samples of effluent when effluent monitors are out of service; de-energizing a plant vent monitor while repairing another monitor, and failure to have an adequate procedure to detect air in-leakage into an effluent monitor. The licensee took action to correct these matters and preclude recurrence.

The review of this program area indicated the licensee has made general overall improvement in the program despite loss of key personnel. The licensee has promoted personnel to offset this loss. The staffing of the licensee's chemistry organization is adequate. The licensee has been very responsive to NRC initiatives in this area.

Although program improvements were identified, the frequency of problems with process and effluent monitoring systems indicated additional management attention should be directed to this area.

Conclusion

Category 2

Board Recommendations

Conduct a Regional Radiation Protection Specialist follow-up inspection of licensee corrective action for programmatic weaknesses identified during the team inspection, particularly in the area of audits.

3. Maintenance (11.7%)

During the assessment period, two regional-based inspections associated with technical concerns and non-destructive examination (NDE) of service water piping weld corrosion were performed. The area was also the subject of routine monthly inspections of maintenance activities by the resident inspectors. In addition, considerable additional effort was devoted to this area in conjunction with the ATWS events. After the assessment period, a team inspection was completed in the maintenance area to verify completion of certain long term corrective actions and to determine the status of others.

Although some preventive maintenance activities were scheduled and performed prior to the ATWS events through the use of the inspection order system, both the licensee and the resident inspectors had identified the need for developing a more inclusive program. After the ATWS event, the NRC provided the motivation for the accelerated development and implementation of a comprehensive Managed Maintenance Program. This preventative maintenance (PM) program was still under development at the end of the assessment period. It is expected to be implemented during the first half of 1984. The lack of a well defined PM program contributed to the Reactor Trip Breaker (RTB) failures.

Generally, management involvement is evidenced by prior planning and assignment of priorities. Decision making is usually at a level that ensures adequate reviews.

Corporate engineering support is usually provided to aid the maintenance department in troubleshooting repetitive component failures. A good example of this is the Service Water inspection program, which was established to prevent or minimize the effects of silt and/or biofouling of components cooled by service water. The overall management problems that came to light during the ATWS investigation are addressed in the Operations area; however, deficiencies such as a lack of QA review of work order classification, issuance of the master equipment list as an uncontrolled document and a lack of a program for controlling vendor supplied information, all contributed to the poor maintenance performance associated with the RTBs. A subsequent audit by the licensee and a sampling review by the NRC of the Work Order system did not result in identifying a programmatic breakdown affecting other safety-related systems and/or components.

Management and control of the site maintenance contractor is also generally evident. The contractor normally deals with design changes and modifications; however, routine maintenance is occasionally contracted. The contractor representative is normally present at daily planning meetings to coordinate his activities with the station staff.

Based on licensee response to the biofouling problem in the service water system, the failure of the welds in the No. 12 Component Cooling Heat Exchanger, and the post-ATWS identified equipment issues, the licensee has demonstrated timely and technically sound resolutions. Maintenance records are generally complete and maintained.

One violation was identified in this area concerning improper certification of an NDT inspector. This was not considered indicative of a program breakdown. Events are reported in a timely manner, are usually well identified and are corrected in a timely manner.

Key positions in the maintenance department are identified and staffed. The licensee has also attempted to upgrade the level of understanding in the areas of Technical Specifications and the concept of nuclear safety by staffing some of the maintenance management positions with both STA-qualified and SRO-licensed individuals. This should not only increase understanding but also improve interdepartmental communications.

The licensee has established a comprehensive and extensive maintenance training program. It is well defined and contributes to an adequate understanding of work and fair adherence to procedures. The training program has been implemented for a large portion of the staff. One area that needed improvement was training for supervisor and senior supervisor personnel. The programs for these areas have been evaluated and the first class of supervisory training began in September 1983. These programs together with a requalification program should enhance work practices.

In summary, the Corrective Maintenance Program was well managed and implemented during the assessment period. However, the Preventive Maintenance Program was poorly defined and highly dependent on the efforts of individual supervisors for its limited successes.

Conclusion

Category 2

Board Recommendations

Monitor the implementation of the Managed Maintenance Program quarterly through the augmented inspection program.

4. Surveillance (15.2%)

Various aspects of the surveillance program were reviewed in three region-based specialist inspections, during a task force inspection of the ATWS events, and during routine resident inspections.

In general, management control was evident. There is evidence of prior planning and assignment of priorities. Procedures are well defined, maintained and adhered to. The Inspection Order system provides better than adequate control over routine surveillance. Corporate management is usually involved, especially in the resolution of technical problems and the in-service inspection program. Records are generally complete, maintained and retrievable. Examples include the local leak rate test (LLRT) program, functional test records of the reactor trip breakers and routine Operations department surveillances.

The licensee has demonstrated sound resolution of technical issues, such as weld channel venting, during the integrated leak rate test (ILRT) and procedural changes in the functional tests of the Solid State Protection System to determine degrading conditions. In addition, the resolutions are generally conservative.

The licensee has been responsive to NRC issues in this area. The licensee performed an integrated leak rate test during Unit 2's first refueling outage in response to NRC concern, although not required by Technical Specifications or regulations. The licensee has responded favorably to NRC concerns about the Reactor Protection system, by increasing testing and improving techniques as a result of the ATWS findings.

Three violations and eight LERs resulted from missed surveillances. In general, the cause was that the surveillance was not controlled by the Inspection Order system. These minor violations and events appear to indicate minor programmatic breakdown. Corrective action for each identified event has been timely. The Inspection Order system is not effective for scheduling surveillance tests with periodicity of a week or less or event-initiated surveillance tests. Retest of relocated Reactor Trip Breakers following maintenance falls into the latter category. Surveillance requirements not in the system are missed due to personnel errors or procedural inadequacies.

The surveillance test program has promptly identified equipment failures. Reporting of these events has been timely. On one occasion, however, the LERs for test failures of the primary safety relief valves were not reported within the required time and this contributed to a violation. The number of reportable events in this area (25) is not exceptional. Equipment failure has been the predominant cause in the reports submitted.

A response to the NRC, concerning a violation in this area during the last reporting period, provided misleading information. Although this particular matter was of minimal safety significance, the situation demonstrated the need for improved communications within the Salem organization to ensure accurate responses to the NRC.

Staffing levels are adequate in that, generally, required tests are performed on time with no backlog. Technicians, especially in the I&C area, are specifically trained and qualified to perform designated tests.

Conclusion

Category 2

Board Recommendations

Continue region based support for major surveillance tests such as the ILRT scheduled for the Unit 1 refueling outage in May 1984.

5. Fire Protection (1.7%)

This assessment is based solely on routine observations by the resident inspectors.

Prior planning and assignment of priorities by licensee management is evident in program procedures, with specific assignments made to implement the requirements of those documents. Decision making was at a level that ensured adequate management review, e.g., review of fire protection supervisor activities by the General Manager - Salem Operations. The new Nuclear Department organization splits responsibilities for the program between the station operating group and the Nuclear Department services group. This action has provided more attention to the area of fire protection, removing operating personnel from program concerns and permitting them to focus on the continuity of site fire detection/suppression capability.

NRC review of a problem with fire protection system valve supervisory panels 1RP5 and 2RP5 during the previous assessment period indicated that the design and correction of the design has not been given high priority by the licensee. The design problems of this system were identified to management by the fire protection supervisor. However, due to the departmental interface problems engineering resolution of these design problems has still not been developed.

The licensee's training and qualification program has been adequate to provide the requisite number of qualified fire brigade members on shift. Implementation of a new training program should improve understanding of personnel duties and adherence to procedures.

Fire doors have historically been a concern due to high traffic flow coupled with ventilation imbalance problems and the frequent degradation which results. In October 1981, the licensee took the position that maintenance of fire doors as presently configured was impossible. Accordingly, the Technical Specification Action Statement was entered and permanent assignment of contracted fire patrols and fire watches throughout the plant was implemented. A design change package to upgrade door hardware and modify door designs to alleviate this condition has been issued but work is not complete.

Plant cleanliness and housekeeping is generally acceptable with an evident program of cleanup. Efforts to prevent the accumulation of debris have been evident in the form of frequent plant tours.

Failure to completely address the design concerns outlined suggests that the fire protecton program did not have management priority commensurate with NRC concern in this area. Current organizational initiatives appear to be slowly resolving this situation.

There were no significant on site fires during the reporting period.

Conclusion

Category 2

Board Recommendations

Conduct planned Appendix R team inspection effort scheduled for January 1984.

6. Emergency Preparedness (7.5%)

During the assessment period, there were two emergency preparedness inspections. On October 13, 1982, an NRC team observed the annual emergency preparedness exercise and concluded that the licensee's performance indicated that the licensee could implement their Emergency Plan and Emergency Plan Implementing Procedure in a manner which would adequately protect the health and safety of the public.

Areas requiring improvement included procedural guidance for detection, classification, and assessment of events; accountability of licensee and contractor personnel in a timely manner; implementation of off site monitoring procedures; and coverage of site with emergency announcements on the plant page system. Some of these areas appear to be continuing problem areas in spite of licensee commitments and efforts to improve them. For example, the low threshold for classification of significant events requiring NRC notification under 10 CFR 50.72 as Unusual Events has led to unnecessary overreactions to routine events and reporting problems noted in the operations functional area. This has been addressed by the use of a dedicated communicator in the control room but the procedures still need improvement. In spite of these problems, management attention to emergency preparedness is evident based on numerous practice drills conducted in preparation for the graded exercise scheduled for October 26, 1983, after the end of the assessment period. In addition, the status of the Public Prompt Notification Program was reviewed and no deficiencies were detected with regard to this program.

The licensee has generally been responsive to NRC issues and provided timely corrective actions for the Appendix A and B items in the Emergency Preparedness Appraisal.

Conclusion

Category 1

Board Recomendations

Ensure that the licensee develops scenarios that better test the ability of the operating staff to assess the plant conditions and make reasonable recommendations based on their assessment. Encourage the licensee to raise the threshold of the Unusual Event classification based on NUREG 0654 recommendations.

7. Security and Safeguards (6.3%)

During this assessment period, one special and three routine physical protection inspections were conducted. Routine resident inspections continued throughout the period.

During the previous assessment period, the licensee experienced several major and multiple minor programmatic breakdowns in the security program. The licensee instituted a major improvement program to deal with numerous problem areas. The improvement program focused on: (1) major reorganization and realignment of security management positions, (2) a reorganization of the contract guard force, (3) the employment of a consultant firm to provide reorganization assistance and to upgrade the areas of training, security procedures, personnel and equipment. Upgrade of the security equipment is ongoing with total implementation expected in spring 1984. At that time, the licensee will be able to meet Security Plan requirements without the use of compensatory measures. This improved program has been subjected to on-site evaluations by the NRC Regulatory Effectiveness Review Team (RER) from the Division of Safeguards (NMSS) and four region-based inspections. With the exception of two violations recorded for this assessment period, the licensee has clearly demonstrated improvement in the security program. Licensee cooperation was evident in their responses to NRC observations and findings.

Licensee management has further improved the operational efficiency and effectiveness of the security program by having made several editorial changes to the Modified Amended Security Plan, Safeguards Contingency Plan, and Training and Qualification Plan. Implementation of these changes has been beneficial to the Security Organization and has improved their performance.

Conclusion

Category 2

Board Recommendations

Monitor licensee performance at a frequency consistent with that of other facilities in Region I.

8. Refueling/Outage Activities (3.4%)

Selected refueling activities were reviewed by the resident inspectors during the Unit 1 and Unit 2 refueling outages conducted during the assessment period. Two inspections were conducted by region-based inspectors in the area of start-up physics testing.

Station planning and control of refueling activities is an element of strength in the licensee's management control systems. Prior to and throughout the outages, management involvement in scheduling and sequencing of work was evident. This continued even though much management attention was focused on the ATWS events. The licensee identified through testing that certain major components such as the Nos. 12, 21, and 22 Component Cooling Heat Exchangers needed extensive repairs. The work, although impacting the outage durations, was well planned and coordinated.

In response to a previously identified problem with the reporting of design change work completion by the contractor, an improved system of walk-throughs was implemented to identify incomplete or inaccurate work. In addition, a group was formed to identify and perform, if necessary, the testing required following implementation of design changes or facility modifications. These activities contribute to the overall control of outage maintenance work.

Refueling activities were conducted by a Westinghouse team and were accomplished without incident.

The Unit 1 Cycle 5 and Unit 2 Cycle 2 start-up physics tests were properly planned and performed according to approved test procedures. The test records were complete, well maintained, and properly reviewed. During the start-up testing, the licensee identified a positive moderator temperature coefficient for Unit 1. Based on subsequent evaluation, appropriate rod withdrawal limits were established and implemented.

Due to a design deficiency for seismic analysis in a modification to install an alternate control power supply to the Unit 1 emergency diesel generators (DG), on two separate occasions all three DGs had to be declared inoperable. The licensee took prompt corrective actions and made timely submittal of the event reports.

Inspection in this area identified no adverse findings.

Conclusion

Category 1

Board Recommendations

Maintain normal region based inspection coverage during the next refueling outages for both units.

9. Licensing Activities

The evaluation was based on evaluation of such licensing activities as failure of Reactor Trip Breakers, Appendix R, Appendix R alternate shutdown, change in core limits and core reload, purge and vent valve, NUREG-0737 responses, environmental qualification of safety-related equipment, IEB 80-11 masonry wall qualification, containment integrated leak rate test program, and Radiological Effluent Technical Specifications (RETS).

The licensee continues to place somewhat better than average management attention on routine licensing actions, multi-plant actions, and amendment requests. This has assured prompt attention to most site-specific actions. PSE&G has also been cooperating with respect to meeting requests and has reacted to the Commission's schedules and priorities. However, a number of evident weaknesses surfaced during and subsequent to the investigation of the ATWS events on Unit 1. The NRC determined that PSE&G should propose a corrective action program to correct these deficiencies. Some of the problems that occurred subsequent to the conclusion of the investigations regarding timely implementation of licensee change requests were undoubtedly due to a week-to-week urgency to restart Unit 1 on which PSE&G management was concentrating most of its efforts.

Since the ATWS events were of major significance, emphasis could have been placed on PSE&G's technical analysis of the causes and corrective actions subsequent to the trip breaker failures. Licensee plans to return Unit 1 to full power operation after only replacing the failed breakers with "good" breakers from Unit 2 was not a good technical decision. However, on the other licensing actions, PSE&G effectively resolved technical issues and for two activities, "Masonry Walls Qualification" and RETS, resolutions were superior. Most of the employees who were involved with licensing reviews have had several years experience with operating nuclear plants and interacting with the NRC.

In our previous assessment, we identified PSE&G responsiveness as being very weak in relation to licensing activities. This may have been due to the unwillingness of some PSE&G employees to transfer to the site. During this assessment period, the Salem Licensing Department has added to its staff and its effectiveness has improved. PSE&G plans to continue to expand the licensing group staff and to improve their methodology when responding to NRC initiatives. Based on the interaction with the PSE&G technical staff during the investigation of the failures of the reactor trip breakers, their performance was adequate. Based solely on NRC involvement in evaluating the ATWS training program after the initial training sessions had been conducted to correct weaknesses identified by the NRC, training and qualification effectiveness was acceptable.

In response to previous appraisals, the licensee has strengthened all operational and safety aspects of the Salem station by concentrating all of the corporate nuclear-related personnel at the site and placing the entire Salem Station and the adjoining Hope Creek construction site under a corporate vice president. This assures prompt attention of all of the licensee's expertise to normal or emergency requirements. However, weaknesses in the management of Salem were uncovered during the trip breaker failure investigation as discussed in area 1 (Plant Operation). Corrective actions are now being implemented and the results of these programs will be assessed in future appraisals. The licensee remains current with all regulatory requirements and his performance on other licensing actions was generally effective.

Conclusion

Category 2

Board Recommendations

None

V. SUPPORTING DATA AND SUMMARIES

1. Licensee Event Reports

Tabular Listing

Type of Events:	Unit 1	Unit 2	Total
A. Personnel Error	14	11	25
B. Design/Man./Constr./Install	9	29	38
C. External Cause	8	13	21
D. Defective Procedures	6	15	21
E. Component Failure	11	24	35
X. Other	9	8	17
Total	57	100	157

Licensee Event Reports Reviewed

Unit 1: Reports 82-75 through 82-93, 83-01 through 83-38
Unit 2: Reports 82-106 through 82-157, 83-01 through 83-48

Causal Analysis

Approximately 30% of all LERs submitted were attributable to procedural or personnel errors. These events could be eliminated or greatly reduced if an improvement in the licensee's attention to detail is made. This would have a corresponding positive effect in the overall plant safety due to increased availability of safety-related components.

Six causally-linked chains were identified:

a. Ten LERs (all on Unit 2) involve service water leaks in Containment Fan Coil Unit coils or the supporting service water system. The licensee has completed a program of material upgrades on Unit 2 during the first refueling outage to prevent recurrence. The LERs in this group are: (Unit 2) 82-109, 82-111, 82-112, 82-113, 82-119, 82-120, 82-122, 82-128, 82-135 and 82-136. This continues a chain identified in the last SALP.

b. Six LERs (2 on Unit 1, 4 on Unit 2) detail inoperability of CFCUs due to low service water flow indication resulting from silt build-up in the CFCUs, the flow transmitter sensing lines or from silt and/or biofouling of the CFCU service water flow control valves. The licensee has implemented increased detection capabilities for these occurrences and has altered their chlorination program to prevent widespread biofouling. The LERs in this group are: (Unit 1) 82-77 and 83-26; (Unit 2) 82-112, 82-123, 82-130 and 82-155. This continues a chain identified in the last SALP.

c. Seven LERs (1 on Unit 1, 6 on Unit 2) detail inoperability of containment airlock doors, usually due to poor sealing or failure of door hardware apparently resulting from harsh use. Improvements in personnel training and preventive maintenance are underway. The LERs in this group are: (Unit 1) 83-35; (Unit 2) 82-110, 82-129, 82-140, 82-153, 83-34 and 83-45. This continues a chain identified in the last SALP.

d. Five LERs (1 on Unit 1, 4 on Unit 2) detail drift in individual rod position indication instruments. The licensee has developed a technique to deal with the temperature dependence of the instruments but it is not fully effective. The LERs in this group are: (Unit 1) 83-29; (Unit 2) 82-108, 82-150, 83-03 and 83-42. This continues a chain identified in the last SALP.

e. Eight LERs (3 on Unit 1, 5 on Unit 2) deal with missed surveillance tests. The most frequent cause appears to be inadequate procedures. The LERs in this group are: (Unit 1) 82-79, 82-80, 83-05; (Unit 2) 82-127, 82-138, 82-143, 83-04 and 83-11. This continues a chain identified in the last SALP.

f. Seven LERs (all on Unit 2) deal with spurious actuations of the 2A Safeguards Equipment Cabinet. Modifications had been completed to prevent recurrence. Additional hardware problems were resolved but total reliability is still in question. The LERs in this group are: (Unit 2) 82-132, 82-147, 83-14, 83-25, 83-31, 83-41 and 83-47. This continues a chain identified in the last SALP.

2. Investigation Activities

None - miscellaneous allegations were examined during routine inspections.

3. Escalated Enforcement Actions

3.1 Civil Penalties

-- Notice of proposed civil penalty issued March 25, 1983, based on plant operations findings during November and December 1982, dealing with modifications to plant vent radiation monitors.

-- Notice of proposed civil penalty issued May 5, 1983, based on plant operations, maintenance, surveillance and quality assurance findings during February and March 1983.

3.2 Orders

-- An order was issued May 6, 1983, confirming licensee commitments to implement and/or maintain items specified in the licensee's April 28, 1983, letter, subject "Corrective Action Summary, Reactor Trip Breaker Failures."

-- An order was issued September 29, 1983, imposing the Civil Penalty as issued on May 5, 1983.

3.3 Confirmatory Action Letters

-- Prior to the assessment period, an NRC letter was issued August 18, 1982, to confirm certain physical protection actions taken as a result of the apparent tampering event of August 16, 1982. As required, the licensee implemented those actions until additional security measures were effected and the Confirmatory Action Letter requirements were terminated on July 11, 1983.

-- On March 7, 1983, an NRC letter was issued to confirm that the licensee would not proceed to criticality without prior NRC approval, as a result of the February 22 and 25, 1983, ATWS events. On April 29, 1983, an NRC letter was issued authorizing restart.

-- On August 18, 1983, an NRC letter was issued to confirm certain Radiation Protection inspection corrective actions.

4. Management Conferences

4.1 Enforcement Conference at NRC Region I office on November 9, 1982, regarding procedural and Technical Specification adherence.

4.2 SALP Meeting at PSE&G Salem NGS on November 23, 1982.

4.3 Management Meeting at NRC Region I office on February 8, 1983, regarding PSE&G security improvement program and relaxation of selected security measures implemented as a result of CAL 82-22, dated August 18, 1982.

4.4 Management Meeting at NRC Region I office on February 15, 1983, to discuss the apparently inaccurate PSE&G response to a violation, issued October 19, 1982, pertaining to out-of-calibration test equipment.

4.5 Management Meeting at NRC Headquarters on February 28, 1983, to discuss the February 22 and 25 ATWS events.

4.6 Public Meeting/NRC Briefing at Washington, D.C., on March 24, 1983, to discuss Salem Post-Trip Report regarding February 22 ATWS event.

4.7 Enforcement Conference held by telephone on March 25, 1983, regarding physical protection program procedural adherence.

4.8 Management Meeting at NRC Headquarters on April 28, 1983, to discuss licensee corrective action program and restart following ATWS event.

4.9 Management Meeting at NRC Region I office on May 18, 1983, to discuss the initial findings of Management Analysis Company's (MAC) diagnostic of PSE&G.

4.10 Enforcement Conference at NRC Region I office on July 22, 1983, regarding control of station activities at Salem Unit 2, principally the loss of Reactor Coolant System vent path.

4.11 Management Meeting at the Salem site on August 9, 1983, to discuss PSE&G progress towards completion of the corrective action program required by the May 6, 1983, Order Modifying License.

4.12 Management Meeting at the Salem site on August 15, 1983, to discuss the findings of a July 1983, Radiation Protection inspection and to confirm corrective actions.

TABLE 1

TABULAR LISTING OF LERs BY FUNCTIONAL AREA

SALEM NUCLEAR GENERATING STATION - UNITS 1 AND 2

	Area	Number/Cause Code						Total
1.	Plant Operations	19A	20B	8C	7D	4E	3X	61
2.	Radiological Controls				3D	3E	1X	7
3.	Maintenance	4A	5B	4C	4D	7E	3X	27
4.	Surveillance	1A	3B	2C	6D	12E	1X	25
5.	Fire Protection			1C		1E	3X	5
6.	Emergency Preparedness	NONE						
7.	Security and Safeguards	NONE						
8.	Refueling		1B	1C	1D		1X	4
9.	Licensing Activities	NONE						
	Other (Original Design Errors and Equipment Failures not Classifiable Into Areas 1-9)	1A	9B	5C		8E	5X	28
							TOTAL	157

Cause Codes
- A. Personnel Error
- B. Design, Manufacturing, Construction, or Installation Error
- C. External Cause
- D. Defective Procedures
- E. Component Failure
- X. Other

TABLE 2

INSPECTION HOURS SUMMARY (10/1/82 - 9/30/83)

SALEM NUCLEAR GENERATING STATION

		Hours	% OF TIME
1.	Plant Operations	1525	41.1
2.	Radiological Controls	488	13.1
3.	Maintenance	434	11.7
4.	Surveillance	564	15.2
5.	Fire Protection	64	1.7
6.	Emergency Preparedness	278	7.5
7.	Security and Safeguards	233	6.3
8.	Refueling/Outage Activities	127	3.4
9.	Licensing Activities	No Data	
	Total	3713	100%

TABLE 3

INSPECTION REPORT ACTIVITIES

SALEM NUCLEAR GENERATING STATION

REPORT		INSPECTOR	AREAS INSPECTED
UNIT 1	UNIT 2		
	82-22	Specialist	Emergency Preparedness Exercise
82-27	82-26	Resident	Routine
82-28		Specialist	Radioactive Effluent Monitoring
	82-28	Resident	Special Inspection of Valve Misalignment
82-29	82-27	Specialist	Radiation Protection
82-30		Specialist	In-service Inspection
82-31	82-29	Specialist	Enforcement Conference
82-32	82-30	Resident	Enforcement Conference
82-33	82-31	Resident	Routine
82-34		Specialist	Service Water Piping Weld Corrosion
82-35	82-32	Specialist	Plant Shielding Design Review
82-36	82-33	Resident	Routine
83-01	83-01	Specialist	Quality Assurance and Audits
83-02		Specialist	Nondestructive Examination
83-03	83-02	Specialist	Emergency Preparedness
83-04	83-03	Specialist	Local Leak Rate Testing
83-05	83-04	Specialist	Radiation Protection
83-06	83-05	Resident	Routine
83-07	83-06	Resident	Security Program Meeting

TABLE 3 (continued)

REPORT		INSPECTOR	AREAS INSPECTED
UNIT 1	UNIT 2		
83-08	83-07	Resident	Routine Security
83-09	83-08	Specialist	Waste Shipment
83-10	83-09	Specialist	Management Meeting
83-11	83-10	Specialist	Physical Protection
83-12	83-13	Resident	Routine
83-13	83-19	Resident	Routine
83-14	83-11	Specialist	Refueling Radiological Controls
	83-14	Specialist	Special Personnel Contamination Event
83-16	83-15 & 83-18	Resident	Routine and Special on Loss of Reactor Coolant System Overpressure Protection
83-17	83-16	Specialist	Special Physical Protection
83-18	83-17	Specialist	Routine Local Leak Rate Testing
83-19		Specialist	Start-up Testing
83-20	83-20	Specialist	Transportation
83-21	83-21	Project Engineer	Management Meeting
83-22	83-22	Specialist	Radiation Protection
83-23	83-23	Specialist	Physical Protection
83-24	83-24	Resident	Routine
	83-25	Project Engineer	Enforcement Conference
83-25	83-26	Resident	Routine

TABLE 3 (continued)

REPORT		INSPECTOR	AREAS INSPECTED
UNIT 1	UNIT 2		
83-26	83-27	Project Engineer	Management Meeting
83-28	83-28	Specialist	Physical Protection
83-29	83-31	Specialist	Radiation Protection
	83-29	Specialist	Start-up Testing

TABLE 4

VIOLATIONS (10/1/82 - 9/30/83)

SALEM NUCLEAR GENERATING STATION

A. Number and Severity Level of Violations

Severity Level	Common	Unit 1 Only (*)	Unit 2 Only (**)
Deviations	1	0	0
Severity Level I	1	0	0
Severity Level II	6	0	0
Severity Level III	1	1	1
Severity Level IV	3	6	6
Severity Level V	7	0	0
Total	19	7	7

B. Violations vs. Functional Area

	Severity Levels					
FUNCTIONAL AREAS	DEV	I	II	III	IV	V
1. Plant Operations		1	6	1* 1** 1	2* 2**	1
2. Radiological Controls	1				1 3* 3**	4
3. Maintenance					1*	
4. Surveillance					1** 1	1
5. Fire Protection						
6. Emergency Preparedness						
7. Security and Safeguards					1	1
8. Refueling						
9. Licensing Activities						
Others						
Totals	1	1	6	3	15	7

Total Violations = 32

Table 4 (continued)

Summary

Inspection Unit 1	Inspection Unit 2	Inspection Date	Subject	Requirements	Severity	Area
82-27	82-26	9/28/82-11/8/82	Failure to perform fire detection instrumentation surveillance in specified time	T.S.	IV	4
82-27	82-26	9/28/82-11/8/82	Failure to perform reactor coolant system inventory balance surveillance in time specified	T.S.	V	4
82-28	----	8/27-29/82-9/3/82	Failure to implement gaseous radwaste release calculation procedures	T.S.	IV	2
----	82-28 82-30	10/6/82-10/12/82 11/9/82	Failure to implement safety tagging procedures	T.S.	IV	1
82-33	----	11/9/82-12/21/82	Failure to maintain containment vent monitor operable while purging containment	T.S.	III	1
82-36	----	11/22/82-1/25/83	Failure to take and analyze daily grab samples of plant vent releases	ETS	IV	2
83-02	----	1/18/83-1/21/83	Use of an uncertified liquid penetrant examination technician	10CFR50 APP B	IV	3
83-06	83-05	1/26/83-3/25/83	Operation with inoperable Reactor Trip Breakers (RTB)	T.S.	I	1
83-06	83-05	1/26/83-3/25/83	Failure to identify and correct RTB failures	10CFR50 APP B	II	1
83-06	83-05	1/26/83-3/25/83	Failure to apply QA program to RTBs	10CFR50 APP B	II	1
83-06	83-05	1/26/83-3/25/83	Failure to use applicable quality requirements in procurement of RTBs	10CFR50 APP B	II	1

Table 4 (continued)

Summary

Inspection Unit 1	Inspection Unit 2	Inspection Date	Subject	Requirements	Severity	Area
83-06	83-05	1/26/83-3/25/83	Failure to follow procedures for RTB work order classification and review, and to use appropriate preventive maintenance for RTBs	10CFR50 APP B	II	1
83-06	83-05	1/26/83-3/25/83	Failure to maintain RTB traceability	10CFR50 APP B	II	1
83-06	83-05	1/26/83-3/25/83	Failure to perform required RTB testing	T.S.	II	1
83-06	83-05	1/26/83-3/25/83	Failure to report events within 1 hour	10CFR 50.72	III	1
83-08	83-07	2/3/83-2/4/83	Failure to maintain vital area barrier integrity	Security Plan	IV	7
83-09	83-08	1/17/83	Failure to brace waste shipment to prevent shift of lading	10CFR71.5	V	2
83-11	83-10	2/28/83-3/4/83	Failure to implement security badging procedure	Security Plan	V	7
83-12	83-13	3/26/83-5/10/83	Failure to submit licensee event reports in specified time	10CFR 50.71	V	1
83-14	----	3/21/83-3/25/83	Failure to use suitable measurements of airborne alpha radioactivity	10CFR 20.103	IV	2
83-14	----	3/21/83-3/25/83	Failure to follow extended radiation exposure permit procedure requirements	T.S.	IV	2

Table 4 (continued)

Summary

Inspection Unit 1	Inspection Unit 2	Inspection Date	Subject	Requirements	Severity	Area
----	83-14	4/17-18-21-22/83	Failure to use engineering controls to limit airborne radioactivity	10CFR 20.103	IV	2
----	83-14	4/17-18-21-22/83	Failure to perform airborne radioactivity measurements	10CFR 20.103	IV	2
----	83-15	5/11/83-6/8/83	Failure to perform control room emergency air conditioning surveillance test in required time	T.S.	IV	4
----	83-15	5/11/83-6/8/83	Failure to establish containment integrity in required time	T.S.	IV	1
83-16	----	5/11/83-6/8/83	Failure to implement system alignment procedures	T.S.	IV	1
----	83-18	5/9/83-5/18/83	Failure to establish reactor coolant system vent path with POPS inoperable	T.S.	III	1
----	83-19	6/9/83-7/12/83	Failure to implement procedures for positioning ECCS throttle valves	T.S.	IV	1
83-22	83-22	7/25/83-7/29/83	Failure to adequately retrain radiation protection personnel	T.S.	V	2
83-22	83-22	7/25/83-7/29/83	Failure to comply with radiation protection procedures	T.S.	IV	2
83-22	83-22	7/25/83-7/29/83	Failure to apply quality provisions to procurements for breathing air	10CFR50 APP B	V	2
83-22	83-22	7/25/83-7/29/83	Failure to post notices of violation	10CFR19	V	2