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EXECUTIVE SUMMARY

Salem Inspection Reports 50-272/96-16; 50-311/96-16 September 23, 1996 - November 15, 1996

This inspection included aspects of licensee engineering and plant support. The report covers an 8-week period of inspection related to equipment and engineering performance issues that require resolution prior to Salem restart. These issues are included in Checklists II and III of the NRC restart action plan.

Engineering

Based on their review of three closure packages and five unresolved items and violations, the inspectors concluded that:

- Licensee's walkdown efforts contributed significantly to baselining the plant as built configuration with plant drawings. Their review of NRC restart item II.2, Configuration Control, failed to address all issues encompassed by the item. As a result the package had to be withdrawn from NRC review.
- Significant progress was made in upgrading and improving engineering programs and processes and in resolving open self and third-party-identified issues. Root cause analyses were being effectively performed and a process to ensure proper identification and resolution of emerging technical issues had been successfully implemented.
- Implementation of the 10 CFR 50.59 safety evaluation process was acceptable.
- The program to validate the adequacy of plant fuses and to ensure that proper fuse configuration would be maintained in the future was acceptable and the resolution of fuse concerns was also generally acceptable. One area of concern was the licensee's resolution of control power transformer fuses which continued to be incomplete and insufficient.
- Resolution of four unresolved items and violations pertaining to inadequate 10 CFR 50.59 safety evaluations was acceptable.





Report Details

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Introduction

On February 23, 1996, the NRC issued the restart action plan for Salem Units 1 and 2. Restart Issue Checklists II and III.a include the technical and programmatic issues that require resolution. These issues, related to NRC concerns regarding equipment performance problems and plant personnel issues, involved previously identified unresolved items and violations as well as generic concerns. The purpose of the current inspection was to review the closure packages prepared by the licensee to address these issues. Except as noted, the review was conducted in accordance with inspection procedure 92903.

E2.2 NRC Restart Issue III.2 - Configuration Control (Open)

a. Inspection Scope

The inspector conducted a review of PSE&G's actions to correct problems with configuration control. This effort included an evaluation of PSE&G's root cause assessment, and a review of the remedial actions to prevent recurrence.

b. Observations and Findings

Table III of the NRC restart action plan for Salem specified that PSE&G, in addressing configuration control, also identify their program for setpoint control and drawing control. In their closure package, PSE&G stated that NRC identified configuration control issues with regard to Safety Tagging (IR 95-80), Work Control (IR 95-80), Hagan Modules (IR 95-10), and Fuse Control (IR 95-10) would be addressed under restart issue packages P-12, P-17, T-14, and T-12, respectively. The inspector agreed with the exclusion from this closure package of all but the Hagan Modules issue. Per discussions with PSE&G personnel, technical issue package T-14 only addressed the specifics of the Hagan Module configuration control issue and not the generic implications of this issue with respect to other vendor-serviced equipment. Because the NRC identified similar problems with other vendors, e.g., unknown or unauthorized equipment changes made by the vendors of the emergency diesel generator (EDG) governor and the steam driven auxiliary feedwater pump governor, the NRC believed that a generic review of this issue was appropriate. Based on this concern and other concerns described below, PSE&G withdrew the closure package from the NRC review and planned to resubmit it at a later date.

The inspector noted that package P-2 did not address the setpoint control program specified under Item III.2 of the NRC restart action plan. PSE&G planned to address this item in the revised closure package, when it is resubmitted for NRC review at a later date.

During a review of report SA-95-013, Root Cause Assessment of Configuration Control Related Incident Reports, the inspector discovered a recent change to the corrective action program (CAP) that affected trending information. Trending information from the corrective action database was used by PSE&G to measure and evaluate the effectiveness of various corrective actions, including the corrective actions for configuration control. The recent change to the corrective action program could prevent this data from being included in the trending process.

The inspector discussed his observation with the corrective action group manager, who stated that the intent of the change was to eliminate trending of all significance-level-4 items and those significance-level-3 items that did not meet the trending criteria specified in the CAP procedure. In practice, significance-level-3 items were still being included in the trending program. To address the inspector's concern, PSE&G issued action request (AR) #961004217 to revise the Root Cause Manual, DTG-CAP-003, and paragraph 5.2.5.C.1 of the CAP procedure and ensure that significance-level-3 items be coded for trending. The inspector verified that appropriate significance-level-3 ARs were being coded for trending.

To address discrepancies between as-built plant condition and design basis documents, PSE&G conducted configuration control walkdowns of 46 systems considered important to safe and reliable operations. The inspector reviewed ten system walkdown packages to verify that the walkdowns had met the requirements of the walkdown procedure and to assess the effectiveness of the corrective actions taken for identified deficiencies. The inspector found that:

- PSE&G had previously identified a problem with an orifice plate which was located too close to an elbow and affected the flow instrument accuracy. As part of the walkdown effort, orifice plate location measurements were gathered and forwarded to the engineering staff to verify acceptability. Discussions with Engineering revealed that, although the closure package implied that the effort had been completed, the information was yet to be evaluated for conformance with the applicable drawings.
- PSE&G had previously identified a problem with bolting material on the service water pumps. To address this issue generically, a sampling of field-installed bolting material was to be collected during the walkdowns and evaluated for conformance to applicable specifications. While the walkdown packages contained the field information recorded for installed bolting material, the inspector was unable to verify, from the documentation contained in the walkdown packages, the method used to determine acceptability of the bolting material or that ARs had been initiated to address discrepancies.

c. <u>Conclusion</u>

The Salem staff had performed system walkdowns to identify discrepancies between the as-built plant and the system drawings. Appropriate corrective actions were taken to resolve identified discrepancies. The walkdown effort contributed significantly to baselining the plant as-built configuration with plant drawings. No further inspection is required in the area of drawing control.

The inspector identified several inadequacies with the configuration closure package which resulted in PSE&G withdrawing it from the NRC review. The areas requiring PSE&G resolution included: 1) generic implications of unauthorized/unknown vendor changes on plant components; 2) status of the setpoint control program; 3) method of documenting bolting material acceptability; and 4) evaluation of walkdown data on the flow measuring orifices. These items will be inspected subsequent to PSE&G resubmitting the configuration package for NRC review.

E2.3 <u>NRC Restart Issue III.11 - Engineering Contribution to Problem Resolution, Including</u> <u>Safety Evaluations (Open)</u>

a. <u>Inspection Scope</u>

NRC SALP Report No. 50-272; 311/93-99 and NRC SIT Report No. 50-272; 311/95-80 documented significant problems associated with root cause assessments and equipment problem resolution. The NRC determined that Engineering did not always proactively seek out and correct system and component deficiencies before they led to potentially unsafe conditions. To address these problems and related causal factors, PSE&G initiated a major organizational restructuring and program upgrade, which included the consolidation of engineering organizations, establishment of new management goals and objectives, increased involvement with emergent and ongoing plant technical issues, establishment of a root cause analysis (RCA) group, and extensive assessment and upgrade of engineering programs and processes.

The inspector attended scheduled meetings, and reviewed root cause analysis reports, program assessments, and corrective action documents to assess PSE&G's progress in addressing the engineering programmatic and process deficiencies. The inspector also reviewed recently prepared safety evaluations as a follow up to the NRC's previous review of this area documented in NRC Inspection Report No. 50-272; 311/96-13.

b. Observations and Findings

Program Assessment Review

To address the problems affecting Engineering, PSE&G conducted many selfassessments and third party reviews generating many reports. The inspector selected for his review of this area three self-assessment reports, two third-party reviews, and two Offsite Safety Review (OSR) assessments that had been performed of engineering programs and processes. The inspector focused his review on the scope and findings of the reports, and the corrective actions taken to resolve identified problems.

The inspector determined that PSE&G had performed acceptably in identifying problems and program deficiencies and weaknesses, and had issued the required documents (ARs) to record these conditions. From a sampling of the ARs the inspector determined that the completed corrective actions were acceptable. The inspector also determined that a significant amount of corrective measures were still incomplete (approximately 45 out of 103 at the conclusion of the inspection) or had been closed based on the configuration baseline document (CBD) effort that was scheduled to be performed for Salem.

For those activities that were still open, the inspector reviewed the assigned completion dates and evaluated their reasonableness. The inspector also reviewed the corrective actions that were deferred as part of the CBD effort. He determined that the delay appeared to be reasonable based on the minor safety significance of the specific items identified. For example: several assessments had documented that some calculations had not been kept current with the as-built plant configuration and that programmatic weaknesses had contributed to these problems. The revision of these calculations had been scheduled to be addressed as part of the CBD effort. The inspector's review of specific calculations determined that the calculations were either updated or a corrective action to update the calculation in the future had been initiated. The inspector also found that the changes that had not been reflected in the calculations of record. The programmatic concerns had been evaluated and those requiring change prior to restart had been revised or had been scheduled to be revised.

Based on the results of the above review and personnel interviews, the inspector concluded that PSE&G's actions to address the assessment results were acceptable.

Although the sample AR review did not identify any safety-significant engineering activities that had been improperly deferred until after the Unit 2 restart, the inspector discussed with engineering staff and management personnel the methods used by them to evaluate the significance of identified deficiencies and to schedule their resolution. The inspector determined that each issue undergoes several screening levels both from engineering and operations personnel, including the System Readiness Review Board, to determine its impact on the operability of the system.

A third party design change process review titled, "Engineering Assurance Design Change Package Quality Review Hope Creek Generating Station and Salem Units 1 & 2," (Reports # 95-241 and 95-252), conducted between October 23 and December 1, 1995, resulted in numerous questions being presented to PSE&G Engineering for response and resolution. The inspector reviewed forty (40) questions and responses and determined that, with the exception of those identified below, PSE&G had either resolved the issues or initiated appropriate corrective measures to address the concerns.

For item MECH-S02 associated with DCP 1EC-3311, Package 1, Salem Auxiliary Building Ventilation System Upgrade, PSE&G's response was incomplete in that a question concerning how the fasteners used in the manual damper assembly were secured (torqued) had not been answered. This DCP removed the automatic damper operators and controls from the individual safety-related room ventilation ducts and replaced them with manual quadrant operators. The concern was that, if the set screws or the damper nut were to loosen, the damper would be free to move from its balanced position.

The inspector reviewed the DCP and determined that the installation instructions did not identify the method to lock or secure the set screws that hold the crank assemblies to the damper shafts and the nuts that hold the dampers in their pre-set positions. The DCP did require the use of procedure SC.MD-GP.ZZ-0022(Q), General Bolt Torquing & Bolting Sequences; however, this procedure was not applicable and had not been used for this installation. The inspector requested that PSE&G provide to the NRC the method used in locking the crank assembly set screws and the damper assembly nut. This is item is unresolved pending licensee review and NRC acceptance of this issue. URI (50-272; 311/96-16-01)

During the review of Self-Assessment Report #SA-96-05, Configuration Management Effectiveness, the inspector noted that of fourteen ARs initiated to report conditions discovered during the assessment, four had been incorrectly identified as Business Process (BP) type. BP type ARs are not used to report conditions adverse to quality. Also, these ARs, while requiring corrective action, do not receive the same level of attention as a Condition Report (CR) type AR. For example, BP type ARs do not require tracking or trending to identify repetitive conditions and initiate appropriate preventive action. The inspector identified this weakness in the AR classification process to PSE&G management who issued CR #961101096 to address this observation. This issue is open pending the licensee's review of the current process and the NRC verification of the corrective action adequacy. IFI (50-272; 311/96-16-02) Based on its minor significance, this inspection followup item is not a restart issue.

Root Cause Analysis

Root Cause Analysis (RCA) requirements are delineated in procedure NC.NA-AP.ZZ-0006(Q), Revision 14, Corrective Action Program. PSE&G also issued desk top guide, DTG-CAP-003, Revision 0, Root Cause Manual, which provides the planning methods, instructions, and techniques for personnel performing root cause analysis evaluations. The adequacy of the RCA program will be reviewed during NRC's inspection of item III.10 of the NRC restart action plan, Corrective Action Program. The scope of this review was the engineering implementation of the RCA program

PSE&G Engineering has established a Root Cause Analysis Group consisting of three members and a supervisor. Discussions with the group supervisor indicated that the members function in a mentoring capacity for level 1 RCAs and that the majority of the engineering staff had received RCA training. At the time of the inspection the three members were actively involved in ongoing level 1 root cause analyses.

The inspector selected five level 1 root cause analyses for review. The inspector determined that the RCAs performed by the engineering staff and documented in RCA reports, presented a thorough analysis of the issues. Required corrective actions were documented in accordance with procedural requirements. The inspector also reviewed the training records of nine individuals involved in the RCAs as team members, peer reviewers, or approvers and concluded that all the individuals had received training in root cause analysis, and seven (7) of the individuals had received more extensive training, including electrical/I&C, and mechanical root cause analysis as well as other RCA-related courses. No issues were identified during this review.

Emergent Technical Issues Resolution

The Salem Engineering Department had integrated key engineering personnel into daily plant meetings to ensure that emerging engineering technical issues and problems were presented to system engineering staff for review, prioritization, and resolution. The inspector attended several meetings and concluded that the Salem Engineering Staff had successfully implemented a process for ensuring that emerging technical issues were adequately identified, and appropriate corrective actions measures were implemented. Based on the current engineering involvement with daily plant activities, the inspector concluded that there were reasonable expectations that emergent technical issues would continue to be resolved in a timely manner.

Safety Evaluation Review (10 CFR 50.59)

The inspector's assessment of safety evaluations applicability reviews and safety evaluations that were completed to support permanent plant modifications determined that the implementation of PSE&G's 10 CFR 50.59 safety evaluation process was acceptable. The safety evaluation applicability reviews and safety evaluations reviewed by the inspector were determined to adequately document that a technical specification change or an unreviewed safety question were not

involved. This review, coupled with the safety evaluation implementation review documented in NRC Inspection Report No. 50-272; 311/96-13 satisfactorily completes the safety evaluation review portion of NRC Restart Issue III.11.

c. <u>Conclusion</u>

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The Salem staff has made significant progress in upgrading and improving engineering programs and processes and in resolving the observations and recommendations documented in self-assessments and third-party reviews. While two issues requiring NRC followup were identified, and some identified corrective actions remained to be completed, the inspector concluded that there was reasonable assurance that the engineering programs and processes were acceptable to support plant restart.

The Salem engineering staff had received root cause analysis training. Based on a sampling of RCA reports, the Salem engineering department was performing effective root cause analyses. This area is considered closed for restart.

The Salem engineering staff had successfully implemented a process for ensuring that emerging technical issues were adequately identified, and appropriate corrective actions were implemented. This area is considered closed for restart.

The inspector determined that the implementation of PSE&G's 10 CFR 50.59 safety evaluation process was acceptable. This area is considered closed for restart.

This restart issue remains open, pending resolution of item 50-272; 311/96-16-01, fastener locking on auxiliary building manual dampers.

E2.4 NRC Restart Issue II.12 - Fuse Control Program (Open)

a. <u>Inspection Scope</u>

NRC inspection reports 50-271; 311/96-01 and 50-271; 311/95-10 identified several fuse-related problems, including different fuse sizes installed in Hagan modules and oversized fuses installed in the secondary circuit of control power transformers (CPTs) for 230 Vac and 460 Vac motor control centers (MCCs). Because of these types of fuse discrepancies, inadequate design information (manufacturer and type) on plant electrical drawings, and inadequate bill of material (BOM) database, the NRC questioned the adequacy of fuse control at the Salem station. The scope of the inspection was to assess PSE&G's actions to ensure that adequate fuses were installed and that an appropriate fuse control program had been established.

b. **Observations and Findings**

The inspectors determined that the PSE&G had issued several new design and fuse control procedures and performed configuration walkdowns of the majority of accessible safety and nonsafety-related electrical distribution system (EDS)

equipment. This walkdown also evaluated other components such as molded-case circuit breakers and thermal overloads. In addition, PSE&G initiated a new program intended to gather fuse data on an ongoing basis, validate design information, and resolve identified discrepancies. Under this program, the maintenance department was responsible for inspecting the fuses and for documenting the gathered information.

Fuse Control Procedures

Fuse control procedure SC.DE-PS.ZZ-0051(Q) was issued on May 3, 1996, to provide general guidance for initiating a master fuse list (MFL) of fuses installed in Salem station. The procedure provides detailed guidance to control and track design data of fuses installed either by a new design or by an equivalency evaluation package.

Fuse selection design standard SH.DE-TS-ZZ-2037(Q) was issued on May 3, 1996, to provide technical guidance for proper sizing and selection of fuses and for procurement considerations.

Procedure, PSPP 5.2, was issued on July 25, 1995, to provide guidance for conducting configuration walkdowns of EDS systems and for validating and documenting the fuse installation data. This procedure was used by the licensee contractor performing the walkdowns.

Maintenance procedure SC.IC.GP.ZZ-0121(Q), Revision 4, dated June 2, 1996, was issued to include guidance for inspecting fuses, during the routine maintenance and surveillance activities, documenting the as-found data, and verifying their conformance with station design documents and bills of material. The data gathered through this activity is to be used to develop the Salem MFL.

The inspectors' review of the above procedures determined that they contained sufficient guidance and technical details for the proper selection of fuses and for changing design drawings and bills of material. Responsibilities for issuing and updating and controlling the MFL and for resolving fuse discrepancies were also clearly specified. The inspector also found that the maintenance procedure provided clear direction for inspecting and replacing plant fuses, for documenting fuse data (e.g., design, size, and voltage rating), and for initiating an action request (AR) to address fuse deficiencies. The inspector concluded that the licensee had developed acceptable procedures to properly implement the fuse control program at Salem.

EDS Configuration Walkdown and Maintenance Department Fuse Validation Program

The inspector determined that walkdowns to validate the Unit 2 EDS fuse configuration were performed by contractor personnel. Approximately 85% of the EDS fuses had been inspected. The inspector's sample verification of the walkdown punch list associated with emergency diesel generator 2B, 230V vital control center, and 28 Vdc panel 2A revealed no fuse discrepancies.

Discussion with the licensee determined that the remaining EDS equipment, energized or inaccessible at the time of the walkdowns, was scheduled to be verified by maintenance department personnel, on an ongoing basis, during routine maintenance and surveillance activities, under the newly established validation program. Based on his review of the data collected, the inspector estimated that the licensee had collected and validated data for approximately 95% of the safetyrelated EDS system fuses. The licensee indicated that they were planning to issue an MFL of all the collected data at the end of this year.

The inspector's review of the AR database determined that 32 out of approximately 110 ARs were open and that the majority of ARs involved documentation inconsistencies between the installed fuse and the description in design drawings or BOMs. This review also determined that, except for a CPT secondary side control fuse rating issue, the engineering department had appropriately evaluated and replaced or installed the fuses associated with ten ARs selected at random. The CPT secondary fuse issue is discussed in more detail below.

Based on the above review, the inspector concluded that verification of remaining panels on an ongoing basis was acceptable. He also concluded that the publication of the master fuse list by the end of the year, would provide further assurance regarding fuse control.

To verify the fuse condition and fuse rating, the inspector performed a walkdown of selected fuses installed in Salem Unit 2 equipment, including various 4.16 kV switchgear cubicles, control centers, MCCs, and EDG-2C control and exciter panels. He found that the fuses installed in this equipment were sized and labeled consistently with the design documentation. The inspector noted that in some cases the existing BOM database did not reflect the correct fuse information. Further review determined that the issues identified had been already entered in PSE&G's corrective action process. Discussion with the licensee also determined that documentation discrepancies tracked by the AR process would be addressed in their ongoing fuse control efforts. The inspector concluded that, overall, the fuses at Salem Unit 2 were of good physical condition and labeled appropriately.

Discussions with maintenance personnel determined that the licensee had imparted training on procedural requirements and that Maintenance received skill training on a routine basis to ensure that they brought identified discrepancies to the supervisor's attention and initiated ARs for engineering resolution. The inspector confirmed that the steps in the fuse control procedure were consistent with the description provided by the personnel interviewed.

Oversized Fuse in Control Power Transformer Secondary Circuits

Salem MCCs typically use 300VA, 230/115V, single-phase control power transformers (CPTs) with a calculated secondary circuit current rating of approximately 2.6 A. Based on the plant electrical standard, the appropriate fuse for this application should be approximately 5 A (167% of the full load current). As documented in NRC Inspection Report No. 50-272; 311/96-01, the inspector

determined that the fuses used in this application were 15 A. Because oversized fuses might not be able to clear high impedance faults and potentially cause the cables of the affected circuits to be subjected to temperatures significantly higher than the cable insulation rating, the inspector questioned the impact of faults in nonsafety-related circuits on safety-related components. The inspector was especially concerned about nonsafety-related circuit cables routed through the containment and other harsh-environment zones where multiple short circuits and grounding failures of nonqualified equipment could not be precluded.

Discussions with the licensee determined that, during the original construction, they had intentionally oversized the fuses to forestall nuisance blowing due to inrush current. These discussions also determined that the licensee believed that, in the event of a bolted short circuit, the CPT would supply sufficient current to cause the installed 15 Amps fuse to blow and protect the circuit. For a high impedance faults, however, when the current would not be sufficient to blow the fuse, the licensee believed that no damage would occur to the #14 AWG wire used. The fault would destroy the CPT, instead, and most likely trip the molded case circuit breaker that supplied the CPT and the associated load. The licensee further judged that the failure of the CPT in one MCC compartment would not affect any other compartment or circuits in the same MCC because wiring insulation was flame retardant and would not support combustion.

The above conclusions were based on a licensee preliminary evaluation of the issue and physical measurements of the wiring involved which showed the weakest link in the circuit to be the CPT wound wire. The inspector did not review the measurements taken by the licensee. Therefore, he was unable to confirm the licensee's conclusions. However, he expressed a concern that, even if it was assumed that the transformer failed first, the licensee had not shown that the fault could be contained within the transformer compartment and that adjacent safetyrelated compartments would not be affected by the transformer failure. The licensee indicated that they would prepare a statement of their position regarding this issue.

Hagan Module Fuse Control

To address the fuse concerns associated with the Hagan modules, the inspector discussed the issue with the license and determined that they had addressed their program in item II.14 of the NRC restart action plan, Hagan Modules Replacement Project.

The inspector reviewed package II.14 and confirmed that scope of the project included fuse size, type and voltage rating verification. To assure the adequacy of the fuses in the Hagan modules, the inspectors randomly selected three different model and type of modules at the module refurbishment location and several validated and installed Unit 2 modules. He determined, through visual inspection,

that the fuses were in accordance with applicable module configuration documents and consistent with vendor design requirements. The inspector also determined that the licensee had properly verified and documented vendor requirements for module fuses. The inspector concluded that the licensee had properly addressed the Hagan module fuse concern.

Other Issues

While reviewing the fuse control program, the inspector determined that a licensee contractor had performed an assessment of fuse and breaker coordination at the Salem station, Report SA96-011, dated April 25, 1996. This assessment had addressed short circuit and coordination studies for the vital ac and dc systems, including Appendix R equipment and penetration protection. The objective of the assessment was to compare the Salem design and calculations with the information and guidance provided in applicable standards and licensing documents. This assessment identified several coordination discrepancies.

The licensee evaluated the assessment results and provided justifications for the current plant conditions (AR 960425099, dated May 6, 1996). The licensee had, nonetheless, made plans to reevaluate and update the old calculations by June 30, 1997, as documented in ARs 960425091 and 99. Based on his sample review of the assessment report results and the licensee's justifications, the inspector determined that the issues appeared to have only limited significance and the justifications for the schedule to be acceptable. This item is unresolved pending the licensee's revision and/or validation of applicable analyses and the NRC review of the analyses results. URI 50-272; 311/96-16-03. Based on the above determination and discussions with PSE&G engineering, as described in Section 2.3 above, the inspector did not consider this item to be a restart issue.

c. Conclusion

Based on the above review, the inspector concluded that the licensee had taken appropriate steps to address the fuse-related concerns at the Salem station and established an acceptable fuse control process. The inspector also concluded that validation of installed Unit 2 fuses was acceptable, that documentation and verification of remaining system fuses was ongoing and according to plans, and that the identified documentation discrepancies had been recorded and were being addressed. Resolution of the oversized fuse, however, was still incomplete. Therefore, this issue remains open pending appropriate resolution by the licensee and verification of the results by the NRC.

For Unit 1 Fuse validation was incomplete. Therefore, this item continues to remain open for both Unit 1 and Unit 2.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) Violation 50-272; 311/93-08-03: Failure to prepare 10 CFR 50.59 safety evaluations for temporary modifications (T-Mods).

This issue pertains to PSE&G's failure to perform a 10 CFR 50.59 safety evaluation for two T-Mods. NRC inspection report 50-272; 311/93-08 stated that these examples were of a low safety significance but represented a weakness in the licensee's implementation of the 10 CFR 50.59 program.

The inspector reviewed the licensee's revised letter, dated October 13, 1996, responding to the subject violation. Based on this review and a review of the actions completed by the licensee to address this finding and, more broadly, the safety evaluation process, described in the closure package for NRC restart action plan III.11 (IR 50-272; 311/96-13 and section E2.2, above), the inspector concluded that the licensee had sufficiently addressed the concerns identified in this violation. This item is closed.

E8.2 (Closed) IFI 50-272; 311/94-19-02: Followup of program changes to 10 CFR 50.59 procedure.

This item was opened to followup on required changes to plant procedure NC.NA-AP.ZZ-0059(Q), "10 CFR 50.59 Reviews and Safety Evaluations," (NAP-59). These changes were to clarify peer reviewer/approver responsibilities and to ensure that Safety Analysis Report (SAR) changes that had been approved and implemented, but had not been incorporated into the SAR, were included in the definition of the SAR changes.

The inspector reviewed NAP-59 and verified that the approver assumed the responsibilities of the peer reviewer for those cases when a separate peer reviewer was not required. The inspector also verified that the NAP-59 definition of SAR clearly stated that changes to the FSAR that had been approved via a FSAR Change Notice, but not yet incorporated into the FSAR by revision, were included in the SAR definition. This item is closed.

E8.3 (Closed) Violation 50-272; 311/95-07-04: Inadequate 10 CFR 50.59 Safety Evaluations.

This violation was associated with inadequate 10 CFR 50.59 safety evaluations performed by the licensee for a degraded 125 Vdc battery cell and a RHR room cooler motor installation. For the 125 Vdc degraded battery cell post seal, the safety evaluation failed to adequately document that an Unreviewed Safety

Question (USQ) was not involved. For the RHR room cooler motor installation, PSE&G: (1) failed to adequately document the basis for concluding that the seismic and environmental qualification of a replacement motor did not affect operability of the RHR room cooler; (2) improperly used redundancy of trains to justify that the change would not increase the consequences of an accident previously evaluated in the SAR; and (3) failed to evaluate the effects on RHR operation prior to installing the replacement motor in 1989.

In their response, dated November 15, 1995, for the degraded battery cell post seal, PSE&G agreed with the violation and stated that they would: (1) revise the 10 CFR 50.59 Applicability Review to provide an acceptable basis for no USQ determination; (2) replace the degraded cell with a new cell; (3) perform a visual examination of other safety related batteries to verify that no other post seal deterioration was present; (4) counsel the individuals involved in the original applicability review regarding the need for improved quality in this area; and (5) conduct additional training to personnel on the weaknesses identified with the applicability review.

The inspector verified that the revised 10 CFR 50.59 Applicability Review provided an acceptable basis for concluding that no USQ was involved. He also reviewed the work order and confirmed that the replacement of the degraded cell and the inspection of the other cells had been completed. The inspector's review further determined that this issue was included in Nuclear Training Lesson Plan, 0999-095.03B-OEF034-01, dated September 20, 1995. As documented in NRC inspection report 50-272; 311/96-13, PSE&G has improved the quality of the 10 CFR 50.59 safety evaluation program, including the establishment of formal training and qualification requirements for 10 CFR 50.59 preparers and reviewers. This item is closed.

For the RHR room cooler motor replacement, in their response, dated November 15, 1995, PSE&G concurred that they had performed a motor changeout without a safety evaluation, but did not agree that the subsequent safety evaluation was inadequate in regards to addressing seismic and environmental qualification issues. The qualification of the replacement motor had been reviewed and found acceptable by the PSE&G's Program Analysis Group and documented in Nuclear Engineering Sciences Memorandum SCI-95-0115, dated February 10, 1995. Nuclear Engineering memorandum NE-95-0210, dated March 30, 1995, had further documented PSE&G's evaluation of the replacement motor to extend its qualified life until April 1999. Both of these documents were referenced in the safety evaluation. The inspector reviewed these documents and concluded that PSE&G had provided adequate justification to support the seismic and environmental qualification of the RHR room cooler replacement motor.

PSE&G agreed with the remaining items in the violation and took the following corrective actions: (1) they revised the safety evaluation to justify their conclusion that no USQ was involved for the operation time of the replacement motor; and (2) they reviewed the work order history to ensure that other environmentally qualified

equipment, that had not been formally inspected since 1990 (because of high radiation, contamination, or heat stress accessibility concerns), did not include inadequate components. The inspector reviewed the revised safety evaluation, and the results of the work order review. No concerns were noted. This item is closed.

E8.4 <u>(Closed) Violation 50-272; 311-02013:</u> Failure to complete a 10 CFR 50.59 safety evaluation for the steam generator (SG) power-operated relief valve (PORV) MS-10 modification

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This violation was identified in NRC inspection report 50-272; 311/94-13 and was assessed a civil penalty in EA 94-112. As documented in NRC Inspection Report 50-272; 311/94-13, the SG PORVs were designed to prevent challenges to the main steam code safety valves. In March 1977, the licensee modified the controller for the PORVs such that the PORVs would not open to dump steam to the atmosphere, following the loss of the condenser heat sink, without manual operator action. The changes were made and the plant so operated without the completion of a safety evaluation and without revising the FSAR. The inability of the SG PORVs to open automatically, as described in the FSAR, contributed to the severity of the April 7, 1994 plant transient.

PSE&G, in their letter dated November 1, 1994, responding to the subject violation stated that: 1) the SG PORV controller had been returned to its pre-1977 design configuration consistent with the current FSAR; 2) other operator workarounds had been identified and were being scheduled for resolution; and 3) a sample of design changes issued during the same time frame as the PORV modification would be reviewed to ensure that FSAR changes had been correctly implemented.

The inspector verified that the PORVs had been returned to their pre-1977 design by reviewing the 10 CFR 50.59 safety evaluation and the design change package (DCP). Since that time, the SG PORV controller circuitry has been replaced as part of the digital feedwater system upgrade. The acceptability of the digital feedwater modification will be determined as part of NRC restart action plan item II.4.

The inspector verified that the licensee had developed and scheduled a listing of operator workarounds. The acceptability of the licensee's actions to resolve operator workarounds will be verified during the review of NRC restart action plan item III.8, Operator Workarounds.

The licensee's review of 80 out of a total DCP population of 571 did not identify any additional examples of design changes that had not been incorporated into the FSAR. The inspector reviewed the results of the DCP review and concluded that the sample size and the licensee's conclusions based on the sample data were acceptable.

Based on the above review of the licensee actions and the additional reviews that will be conducted by the NRC as part of the NRC restart action plan, this violation is considered closed.

E8.5 Review of UFSAR Commitments

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that related to the areas inspected. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures and/or parameters.

V. Management Meetings

XI. Exit Meeting Summary

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The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on December 2, 1996. The licensee acknowledged the findings presented.

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

PARTIAL LIST OF ATTENDEES

Public Service Electric and Gas Company

N. F. Conicella, Manager Salem Projects

G. Cranston, Manager, Nuclear Electrical Engineering

L. G. Hajos, Supervisor, Nuclear Electrical Engineering

G. Salamon, Licensing and Resolution

J. Schank, Supervising Engineer - Hagan Project

M. Stephens, DE&P

E. Villar, Licensing Engineer

U. S. Nuclear Regulatory Commission

W. Ruland, Chief, Electrical Engineering Branch

LIST OF ACRONYMS USED

AFW	Auxiliary Feedwater
AR	Action Request
CAG	Corrective Action Group
CAP	Corrective Action Program
CA/QS	Corrective Action and Quality Services
CCHX	Component Cooling Heat Exchanger
CRDM	Control Rod Drive Mechanisms
CRs	Condition Reports
CVC	Centrifugal Charging
ECAC	Emergency Control Air Compressor
EDG	Emergency Diesel Generator
EOPs	Emergency Operating Procedures
ERG	Emergency Response Guideline
FME	Foreign Material Exclusion
FSAR	Final Safety Analysis Report
HDI	Hilti Drop-In
1&C	Instrumentation and Controls
INPO	Institute of Nuclear Power Operations
ISI	Inservice Inspection
LER	Licensee Event Report
MRC	Management Review Committee
MSIVs	Main Steam Isolation Valves
N/A	Not Applicable
NBU	Nuclear Business Unit
NRC	Nuclear Regulatory Commission
NTOC	Nuclear Training Oversight Committee
OD	Operability Determinations
OEF	Operating Experience Feedback
OTSC	On-The-Spot Change
PDR	Public Document Room
PMT	Post-Maintenance Testing
PSE&G	Public Service Electric and Gas
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RVLIS	Reactor Vessel Level Indicating System
SAR	Safety Analysis Report
SERT	Significant Event Response Team
SI	Safety Injection
SIRA	Salem Integrated Readiness Assessment
SNSS	Senior Nuclear Shift Supervisor
SORC	Station Operations Review Committee
SRG	Safety Review Group
SRO	Senior Reactor Operator
SW	Service Water
TRGs	Training Review Group
TRIS	Tagging Request Inquiry System
TS	Technical Specification
UFSAR	Updated Final Safety Analyses Report