U. S. NUCLEAR REGULATORY COMMISSION

REGION I

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| Docket Nos: | 50-272, 50-311 |
| License Nos: | DPR-70, DPR-75 |
| Report No. | 50-272/97-06, 50-311/97-06 |
| Licensee: | Public Service Electric and Gas Company |
| Facility: | Salem Nuclear Generating Station, Units 1 & 2 |
| Location: | Hancocks Bridge, New Jersey |
| Dates: | March 1 - April 12, 1997 |
| Inspectors: | R.L. Fuhrmeister, Sr. Reactor Engineer<br>R.G. Quirk, NRC Contract Engineer |
| Approved by: | William H. Ruland, Chief<br>Electrical Engineering Branch<br>Division of Reactor Safety |

## EXECUTIVE SUMMARY

Salem Nuclear Generating Station
NRC Inspection Report 50-272/97-06, 50-311/97-06

This combined inspection covered aspects of the testing for the startup of Salem Unit 2.

Engineering

- The inspectors saw examples of less than adequate engineering performance during the inspection period. This was evidenced by inadequate test procedures for control room area air conditioning system testing. These inadequacies are additional examples of the problem identified in the Notice of Violation issued with NRC Inspection Report 50-311/96-21, which addressed procedural inadequacies. (Section E4.1)

- A violation was identified when NRC review showed that approved test procedures for the control room area air conditioning system were not conducted as written. (Section E4.1)

- Four previous inspection open items related to the Advanced Digital Feedwater Control System were closed. (Section E8)

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## Report Details

## III. Engineering

### E4 Engineering Staff Knowledge and Performance

E4.1 Control Room Area Air Conditioning Testing Required for Restart (70400)

a. Inspection Scope

The inspector reviewed Design Change Package (DCP) 1EC-3505, Control Area Air Conditioning System (CAACS) and Control Room Emergency Air Conditioning System (CREACS) Upgrade, to determine if the planned and completed testing adequately demonstrated that the system satisfied system design requirements. The modifications were extensive, and associated work continues to be implemented in stages.

Testing procedures inadequacies associated with this modification were addressed in Inspection Report (IR) 50-311/96-21 and were the subject of a Notice of Violation (NOV). In response to the initial inspection comments in December 1996, and prior to the issuance of the IR and NOV, the licensee took corrective actions under Condition Report (CR) 961205250 which included reviewing and revising as necessary the test procedures addressed. The inspector reviewed the adequacy of the associated corrective action.

b. Observations

The licensee conducted various tests for 1EC-3505 Package No. 1 in February and early March 1997 in preparation for going from mode 5 to 4. This was a priority item because the CAACS and CREACS are required to be operable in mode 4. DCP 1EC-3505 Package No. 1 went to a "Workbook Part A Closure" status. This status means the modifications were field complete, priority procedures and drawings were updated, testing required by the DCP was both completed and reviewed by the Level III Test Engineer, and the system was accepted by Operations for additional verification prior to returning it to Technical Specification (TS) operability.

The inspector reviewed some of the standard DCP test sections as well as three of the six Special Test Procedures (STP) in 1EC-3505 Package No. 1. The inspector determined that the test results in two of the STPs did not meet the established acceptance criteria, and some of the test procedures did not appear to be technically adequate. Completed testing reviews by the Level III Test Engineers appeared to be inadequate. After these issues were discussed with various licensee personnel, CRs were generated to address some of the problems.

In parallel with the NRC inspector's efforts, the licensee initiated a Level 1 CR 970310189, which addressed these and other significant problems with the DCP. At the end of the inspection period the licensee had three high level corrective action teams in place. One team was performing a root cause review for the various ventilation system problems, another team was establishing the design

basis for these Engineered Safety Features (ESF) ventilation systems, and a third team was performing a failure mode analysis. The licensee also indicated the multi-discipline Test Review Board (TRB) would review completed test documents for adequacy.

CAACS Integrated Operational Test

The inspector reviewed 1EC-3505, Package No.1, STP-1, "Integrated Test of Control Area Air Conditioning System," to ensure the problems from the previous inspection report were corrected. These problems, such as not ensuring dampers and fans were returned to their normal conditions after pressing the "Normal" control switch, were corrected. The inspector reviewed the completed test results and did not identify any significant deficiencies.

CREACS Cooling Coil Heat Transfer Capability Test

The inspector reviewed 1EC-3505, Package No. 1, STP-2, CAACS and CREACS Coil Test Procedure. The purpose of the test was to either collect heat transfer data from the Unit 1 and Unit 2 CAACS and CREACS cooling coil units for further analysis, or to provide instructions necessary to inspect the air side of the cooling coils. This test was performed to verify adequate heat transfer capability existed and demonstrate compliance with TS Requirement 4.7.6.1.d.5. The inspector identified administrative problems with the test procedures as well as inadequate corrective action based on test results.

The licensee selected the second option, cooling coil inspection, when the test was performed on March 4, 1997. The procedure, in step 5.5.3.7.B, required the generation of an Action Request (AR) to clean the coils if the various inspection criteria listed in the attachment were not met. One activity was to inspect for excessive build up of salts or scale. The acceptance criterion given in Attachment 7.12 was, "Appearance should be of bare metal or shiny appearance." The recorded conditions for the tubes of cooling unit 1HVE200 were a chalky white film existed on the coils. This did not meet the acceptance criterion, but an AR to clean the cooling coils was not generated. During discussions with the inspector, the licensee indicated that, at the time of the test, an AR to clean the coils should have been written, or the test acceptance criterion should have been changed using approved site procedures. However, the action taken was to discuss the situation with a system manager. PSE&G failed to follow the approved test procedure when test personnel failed to initiate an AR to clean the coil. This failure to generate an AR as required by the procedure, constitutes a violation of the approved test procedure, and the requirements of Nuclear Procedure NC.DE-AP.ZZ-0012(Q), "Test Program." **(VIO 50-311/97-06-01)** PSE&G initiated a Level 2 CR 970320247 to address this inspection finding.

The most significant test procedure content problem was that the only overall acceptance criterion was to collect data and forward it to Engineering for analysis. It was possible to complete the test, return the system to TS operable service, evaluate the data, and then determine the system did not meet TS requirements.

The Design Engineer indicated he would not have permitted this to happen, but acknowledged there were no barriers to prevent this. The Design Engineer stated that Level 3 CR 970325258 was initiated to evaluate and resolve this problem. This apparent failure to have a suitable procedure is an additional example of the violation identified in the NOV issued with NRC Inspection Report 50-311/96-21, which related to inadequate procedures for CAACS testing.

Another test implementation error involved the data review acceptance criterion, procedure step 5.6.1. The step was incorrectly marked "N/A per MCR297." Modification Concern and Resolution (MCR) 297 indicated many steps could be marked "N/A" depending on the test approach used, heat transfer measurement or cooling coil inspection. Step 5.6.1 was not one of those steps. The PSE&G Test Engineer indicated this inspection finding would be corrected under Level 3 CR 970320103. This is another example of a failure to comply with the requirements of NC.DE-AP.ZZ 0012(Q), Section 5.2.f **(VIO 50-311/97-06-01)**.

CREACS Duct Work and Filter Housing Leak Test

The inspector reviewed 1EC-3505 Package No.1 STP-4 "CAV Leakage Test." This procedure performed a leak test on a small portion of the ductwork and filter housing upstream of the new CREACS fans. The licensee used a pressure decay test to measure inleakage. The test procedure had technical deficiencies coupled with several test completion problems.

An example of the technical problems was specifying an inadequate test pressure. The procedure specified a 4 inch water column (INWC) test pressure. The correct test pressure should have been 1.25 times the design pressure. The licensee calculated pressure at the suction side of the CREACS supply fan was 4.81 INWC vacuum. If the 1.25 factor was used the test pressure should have been approximately 6 INWC vacuum. This NRC-identified issue is being addressed under level 2 CR 970326255. This apparent failure to have an adequate procedure is an additional example of the violation identified in the NOV issued with NRC Inspection Report 50-311/96-21, which addressed procedural inadequacies for CAACS testing.

Examples of implementation problems are provided below:

Actual leakage exceeded test criterion. The test procedure allowed each unit to have leak rates of 8 CFM; Unit 1 had leakage of 10.78 CFM, and Unit 2 had leakage of 10.59 CFM. The 8 CFM criterion is consistent with the UFSAR commitment to Reg Guide 1.52, Rev. 2, which invokes ANSI/ASME N509, "Nuclear Power Plant Air Cleaning Units and Components," for leak testing. The licensee Test Engineer realized the results were beyond the acceptance criterion and initiated 1EC-3505 MCR 193. Design Engineering evaluated the test results and deemed them acceptable based on calculation PSBP 321040 which demonstrates that compliance with the requirements of Title 10 of the Code of Federal Regulations, Part 50 (10 CFR 50), Appendix A, GDC 19 criterion for whole body exposure is met

with 50 CFM inleakage in the control room ventilation system. The test results were accepted, but the MCR neither changed the test procedure acceptance criterion nor updated the UFSAR. The failure to meet the acceptance criterion is an additional example of a violation of the requirements of NC.DE-AP.ZZ-0012(Q) noted above. **(VIO 50-311/97-06-01)** PSE&G is addressing this matter under Level 2 CR 970326255.

The total test volume was small, and further divided into two sections within the CREACS filter housing using a temporary steel plate. Leakage across the temporary dividing steel plate could increase the observed leakage. The licensee Test Engineer stated he believed the 8 CFM inleakage criterion was too restrictive given the probability there was leakage across the temporary steel dividing plate. If this postulated leakage could have been eliminated, it is possible that the test results might have met the 8 CFM total leakage acceptance criterion. However, there was no analysis to demonstrate this. The licensee analysis demonstrates the 10 CFR 50, Appendix A, Criterion 19 dose limits are not exceeded with the observed inleakage. However, the Level II and Level III Test Engineers signed the test as being completed, and DCP 1EC-3505 Package No. 1 was Part A closed without having met the acceptance criterion in the approved procedure.

Test conducted with inadequate test pressure. The test required a starting vacuum of 4 INWC. Three of the four tests were conducted with atmospheric pressure of 30.4 inches of mercury. This converts to 2150.07 pounds per square foot (psf) absolute (abs). The specified test pressure was 4 INWC, or -20.81 psf gage. Using the 4 INWC vacuum, the initial pressure should have been less than or equal to 2129.26 psf abs. The recorded starting pressures were greater than this. The differences were small, but the specified test conditions in the approved procedure were not met. This failure to comply with the approved procedure is an additional example of a violation of the requirements of NC.DE-AP.ZZ-0012(Q) as noted above. **(VIO 50-311/97-06-01)**

Test Times Not Recorded The test procedure requires recording the initial time, and then recording pressure readings once a minute until pressure decays to 75% of test pressure, or for a maximum of 15 minutes. The initial time and final time were not recorded. The actual test pressure decayed to the 75% value in approximately 10 seconds and the test duration was recorded in seconds and not minutes. The test procedure was not modified to reflect this change. Additionally, no sensitivity analysis was performed to justify extrapolating the actual test results into terms of standard cubic feet per minute. The licensee indicated they would investigate this matter under one of the related CRs. This failure to comply with the requirements of the approved test procedure is an additional example of a failure to comply with the requirements of NC.DE-AP.ZZ-0012(Q) as noted above. **(VIO 50-311/97-06-01)**

Recorded Test Pressure Incorrect The initial and final test pressure recorded in the procedure results table were reversed. In all cases the recorded initial absolute pressure was greater than the final pressure, and this should not be the case during a vacuum test. The licensee Test Engineer concurred with this finding, and verified that a vacuum test, not a pressure test, was performed.

Test Temperature Not Stable The test procedure requires reaching the test pressure and then establishing a steady temperature of ±0.5°F for 10 minutes before recording the initial conditions. In two of the four test runs, the temperature changed 0.1°F in the several seconds the test ran before being terminated. This would result in a temperature change approximately 10 times faster than that permitted by the procedure. This failure to comply with the requirements of the approved procedure constitutes an additional example of a violation of the requirements of NC.DE-AP.ZZ-0012(Q). **(VIO 50-311/97-06-01)**

A vendor computer was used to calculate the total leakage and print the test results. There were either problems with the computer software, or data entry. The printed results, using the recorded barometric pressure and the test pressures, indicate the initial test pressure was less than 4 INWC vacuum, and the initial and final pressure were reversed. These results are inconsistent with recollections of test personnel as well as other information on the completed data sheet. The inspector was also unable to reproduce the computer program results using the calculation method specified in the procedure. These discrepancies were noted by the NRC inspector, and not identified by the Level II or Level III Test Engineers nor the Design Engineer during their reviews. In addition to this being another example of inadequate test results review, it also raises questions regarding the quality of the computer software used to calculate test results. The licensee could not identify what quality control procedures were in place for the computer software used for this test of safety-related equipment. This issue remains unresolved, pending NRC review of the PSE&G determination of what controls were, and should have been, applied to the vendor computer software. **(URI 50-311/97-06-02)**

c. Conclusions

The corrective actions for the earlier identified CAACS/CREACS test procedures were inadequate in that they did not identify test procedure inadequacies for other associated CAACS/CREACS test procedures.

The licensee failed to follow an approved test procedure which conflicts with requirements in NC.DE-AP.ZZ-0012(Q), "Test Program" section 5.3.5.A. Failure to properly address test results which were outside established acceptance test criteria also conflicts with NC.DE-AP.ZZ-0012(Q). Failure to follow quality-related procedures and failure to properly disposition test results which were inconsistent with their acceptance criteria is a violation. **(VIO 50-311/97-06-01).**

## E8 Miscellaneous Engineering Activities

### E8.1 Feedwater Piping Leak Tests (92903)

Inspection Report 50-311/97-04, Section E4.1, discussed a problem where PSE&G referenced the incorrect procedure for post feedwater system piping modification leak testing. ASME Code 3 piping should be tested using procedure SC.MD-GP.ZZ-0033, and ANSI B31.1 piping should be tested using procedure SC.MD-GP.ZZ

-0192. PSE&G indicated they had recently resolved this issue as part of the corrective action for CR 961203111, and therefore did not have to address it again. The inspector reviewed the corrective action for this CR and determined it only addressed post-maintenance testing, not post-modification testing. As a result of this inspection finding, PSE&G initiated a new CR to address the problem with post-modification leak testing. Since the feedwater and condensate systems are non-safety related balance of plant systems, no further NRC action on this matter is planned at this time.

E8.2 (Closed) Inspector Follow-up Item 50-311/96-21-04, Turbine Roll at 15% vs. 8% in ADFCS Design Documentation (92903)

IFI 50-311/96-21-04 was related to the Advanced Digital Feedwater Control System (ADFCS) design requirement for controlling the steam generator level in automatic while at 8% power and rolling the main turbine. Post-modification test procedure had the main turbine rolled at 15% power. The licensee stated this more conservative approach was followed because the ADFCS controller tuning was not complete at 8% power and the plant had experienced secondary side stability problems at low power. Work request (WR) 970214210 has been initiated to have the main turbine rolled at 8% power at the next startup after ADFCS controller tuning is complete. The WR is tagged as a commitment type (CM CD) related to this IFI. The IFI is closed.

E8.3 (Closed) Inspector Follow-up Item 50-311/96-21-06, Steam Pressure Calculation Failure in Low Power Mode (92903)

IFI 50-311/96-21-06 addresses a failure to test that the Feedwater Regulating Valves (BF19) remain in automatic control when the ADFCS is operating in low power mode (less than 25% power) and steam generator pressure computer point quality goes to a failed condition. The existing ADFCS test procedure verified the BF19 valves fail to manual in high power mode, but not low power mode. In high power mode the main steam pressure signal is used to density compensate the main steam flow signal. The compensated main steam flow value is used in high power mode, but not in low power mode. However, even in low power mode, the valves need to fail to manual. The issue was raised because a system text description provided to the inspector was ambiguous. PSE&G verified that the BF19 valves should fail to manual in both high and low power modes. The IFI is closed.

E8.4 (Closed) Inspector Follow-up Item 50-311/96-21-07, SGFP Runback Logic Drawing Clarification (92903)

IFI 50-311/96-21-07 addressed an area of schematic drawing 218914B9781-15 modified by DCP 2EC-3306 which appeared to be partially erased. The inspector attempted to use the drawing to verify new runback logic test procedures were adequate. The licensee reported that the section of the drawing was inadvertently erased when changing another section of the drawing. The drawing was updated and is being incorporated into 2EC-3306 with an MCR. The inspector reviewed the revised drawing section and determined the associated testing was adequate. IFI 50-311/96-21-07 is closed.

E8.5 (Closed) Technical Restart Issue (T) 4 - Digital Feedwater Installation to Correct Feedwater Control Reliability (92903)

a. Background

Technical Restart Issue (T4) concerns the use of a digital feedwater system to correct steam generator (SG) feedwater (FW) control reliability problems. FW control problems were either the cause of or complicating factors in many plant transients experienced by Salem from plant startup through the plant shutdown in 1995.

T4 also includes problems with the SG Atmospheric Steam Relief Valves (MS10). The MS10 valves failure to open when required was described in NRC Inspection Report 50-272&311/94-80. PSE&G's action to resolve the "reset windup" (inability to respond to a steam pressure increase) problem on a short term basis was described in NRC Inspection Report 50-27&311/94-13. The final resolution for the MS10 valves not opening when required was the replacement of the analog controllers with digital controllers as part of the Advanced Digital Feedwater Control System (ADFCS).

An NRC review of the ADFCS concluded there were three 10 CFR 50.59 issues requiring clarification. These dealt with the possibility for a different type of initiating event, or a malfunction of a different type than any evaluated previously in the UFSAR. This issue was described in NRC Inspection Report 50-272/96-06, 50-311/96-06, and is included in Technical Restart Issue T4.

b. Observations and Findings

The inspector reviewed DCP package 2EC-3178 which implements the ADFCS; the DCP documented that the ADFCS was a field proven and reliable system. This DCP also eliminated the reactor trip on steam flow/feedwater flow mismatch coincident with a low S/G level. This was a significant cause of reactor trips at low power. Details of this package are provided in NRC Inspection Report 50-311/96-21 section E3.3. As discussed in that report, PSE&G conducted extensive testing at the vendor's facility, on the Salem specific control room simulator, and on site. PSE&G Operations, Maintenance, and Engineering have trained on the system. The inspector concluded the maturity of the equipment, the extensive test program, and training demonstrate that the ADFCS should improve the FW control system reliability.

The inspector reviewed two other design change packages which should improve SG FW control reliability. DCP 2EC-3306 replaced the steam generator feedwater pump (SGFP) analog governor with a new Woodward model 505 digital governor and adds an automatic main turbine runback on a loss of SGFP. Details of this package were provided in NRC Inspection Report 50-311/96-21, section E3.3. Testing of this equipment was comparable to the testing of the ADFCS. As with the ADFCS, the digital governor was a mature product. The inspector concluded the new digital governor and automatic turbine runback on loss of a SGFP should improve the feedwater control system reliability.

DCP 2EE-0117 replaced the SGFP turbine hydraulic speed control actuator Woodward model EG-3P with a model EG-10P, modified associated hydraulic oil drain piping, redesigned the linkage to the steam inlet valve servo-motors, and changed the type of oil used for control oil. The changes were made to resolve some long standing SGFP governor actuator instability and linkage wear problems. PSE&G indicated these design changes were made after consultation with the various manufactures involved with the SGFP. PSE&G stated their investigations determined the use of the Woodward EG-3P governor, including the control oil piping arrangements, was not consistent with the De Laval SGFP turbines used at Salem.

The new actuator has twice the torque for the same input. The redesigned linkage ensured there is over-travel for transients and adequate closing force at no load conditions. The new control oil piping arrangements reduced control oil leakage as well as ensured there was an adequate vent path for the control oil. The different control oil was selected because its viscosity was not as sensitive to temperature changes. The problem analysis and resolutions appeared to be thorough.

S/G feedwater control testing is a significant part of the plant heatup and power accession test program. The ability to control SG level, SGFP speed, and SG pressure using the MS10 valves during steady state and transients will be adequately challenged during the test program. Testing during heatup as well as "at power" transients should demonstrate new feedwater control system response is quick yet stable.

PSE&G revised the 10 CFR 50.59 evaluation for the ADFCS to address questions concerning the possibility of a different type of initiating event or a malfunction of a different type than any evaluated previously in the UFSAR. The inspector reviewed the revised evaluation as well as the related Westinghouse Safety Evaluation Check List (SECL) used to support the 10 CFR 50.59 conclusions.

The PSE&G position was that the various ADFCS failure modes were not a new type of accident or initiating event, but were non-safety related control system failures already addressed in the UFSAR. The failure modes analyzed included loss of FW as well as excessive FW flow caused by the FW Regulating Valves (MS19) and their bypass valves (MS40) failing open concurrent with high SGFP speed. Both of these situations were analyzed with the MS10 valves failing open and closed. The PSE&G conclusion was these accidents were bounded by other accidents already analyzed in the UFSAR, and therefore, no unresolved safety question (USQ) existed. The inspector found the accident analysis in order with one exception. The Westinghouse analysis for the excessive FW flow scenario assumed SGFP speeds of 6000 RPM. This was potentially not a conservative assumption as the SGFP has a normal top speed of 5800 RPM but an electrical overspeed setpoint of 6080 RPM and a mechanical overspeed setpoint of 6180 RPM. PSE&G, in conjunction with Westinghouse, reevaluated the scenario.

Using the failure of the ADFCS as the initiating event and an assumed subsequent failure of one Woodward digital governor, one SGFP would speed up to the 5800 RPM governor high end setpoint, but the SGFP with the failed governor would continue to increase in speed beyond 5800 RPM. As the electrical overspeed is associated with the new digital Woodward governor, the assumed failure of the governor would also eliminate the electrical overspeed trip. The SGFP with the failed governor would continue to increase in speed until the mechanical overspeed setpoint of 6180 (+0/-80) RPM was reached. Using basic pump laws where flow is proportional to speed, the combined flow of one SGFP at 5800 RPM and the other pump at 6180 RPM is less than the combined flow of two SGFP running at 6000 RPM. Therefore, the combined flow is less than the flow used by Westinghouse in their earlier analysis. PSE&G revised the ADFCS design change package with MCR 2EC-3178-276 to include the scenario described above.

The PSE&G 10 CFR 50.59 safety evaluation was submitted to NRR for review as required by Inspection Report 96-06. NRR reviewed the 10 CFR 50.59 evaluation as well as the associated PSE&G submittal for a Tech Spec change associated with the ADFCS and the subsequent Safety Evaluation Report (SER). Since the control modes of the feed regulating valve bypass valves and the consolidation of the SGFP, feedwater regulating valve and atmospheric relief valves is described in the Westinghouse topical report WCAP 13502, "Advanced Digital Feedwater Control System for Public Service Electric and Gas Company, Salem Units 1 and 2," which was previously reviewed and approved by NRR. NRR determined that no further actions are required.

c. Conclusion

The inspector concluded the feedwater control system modifications, including the digital feedwater control system, digital governor, new runback logic, and modified governor actuator should result in improved feedwater control system reliability. The revised 10 CFR 50.59 Safety Evaluation, modified to address the ADFCS failure coincident with one Woodward governor failure, is adequate. Restart Issue T4, "Digital feedwater installation to correct feedwater control reliability" is closed.

E8.6 (Closed) Inspection Followup Item 50-311/96-21-10, ECCS Throttle Valve Position Reportability (92903)

a. Background

During the reviews of startup testing for the Safety Injection System documented in Section E3.7 of NRC Inspection Report 50-311/96-21, the inspector noted that PSE&G had identified the potential for ECCS injection throttle valves to have been mispositioned. This was documented in CR 961003224. The concern was that ECCS throttle valve positions were measured using a machinist's rule to determine stem position. Measurements were taken to the nearest sixteenth of an inch. As a result, throttle valves could be restored to a position one eighth inch from the required position, which could have resulted in ECCS flows which did not meet TS requirements. At the time of the inspection, the issue of whether the matter was reportable to the NRC had not been decided by PSE&G.

The inspector reviewed the following documents to determine what conclusions had been reached by PSE&G and to evaluate the adequacy of those conclusions:

- CR 961003224, ECCS Throttle Valve Measurement Inadequate
- S2.OP-ST.SJ-0012(Q), Rev. 3, Emergency Core Cooling - ECCS Throttle Valves
- S2.OP-ST.SJ-0014(Q), Rev. 9, Intermediate Head Cold Leg Throttling Valve Flow Balance Verification
- S2.OP-ST.SJ-0015(Q), Rev. 11, Hot Leg Throttling Valve Flow Balance Verification
- S2.OP-ST.SJ-0016(Q), Rev. 12, High Head Cold Leg Throttling Valve Flow Balance Verification
- 10 CFR 50.72, Immediate notification requirements for operating nuclear power reactors
- 10 CFR 50.73, Licensee event report system

b. Observations and Findings

CR 961003224 concluded that the issue of potential for having mispositioned ECCS throttle valves due to inadequate measurement techniques was not reportable. This decision was based, in part, on a records check which determined that the ECCS throttle valve position verification surveillance test had not been performed for cause (as a result of valve repositioning). In addition, a search was performed of the database for the tagging Request and Information System (TRIS) which determined that the majority of the valves had not been repositioned since 1993, [during the last flow test]. The valves which had been repositioned, were done during this outage for work activities.

c. Conclusions

Based on the lack of an identified instance of an ECCS throttle valve being mispositioned, and the reporting requirements specified in 10 CFR 50.72 and 50.73, the inspector concluded that the matter is not reportable. This item is closed.

## V. Management Meetings

### X1 Exit Meeting Summary

The inspectors presented the inspection results to members of PSE&G management and technical staff at the conclusion of the inspection on April 10, 1997. PSE&G acknowledged and did not challenge the findings presented at that time.

Some of the information reviewed during the inspection was marked as proprietary information. Those materials were returned to PSE&G at the end of the inspection.

## PARTIAL LIST OF PERSONS CONTACTED

Public Service Electric and Gas Company

E. Nagy, Startup Manager
G. Boerschig, Manager, Nuclear Electrical Engineering
P. Moeller, Principal Engineer, Administrative Support
D. Hassler, Acting Salem Licensing Manager
E. Villar, Licensing Engineer
S. Funsten, Project Engineer
R. Chan, Project Engineer

U.S. Nuclear Regulatory Commission

C. Marschall, Senior Resident Inspector
R. Fuhrmeister, Senior Reactor Engineer
R. Quirk, NRC Contract Engineer

## LIST OF INSPECTION PROCEDURES USED

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|---|---|
| IP70400 | Preoperational Test Results Evaluation |
| IP92903 | Followup Engineering |

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

OPENED

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| VIO 97-06-01 | Testing not performed in accordance with approved procedures. |
| URI 97-06-02 | Controls for software for computer used by contractor to perform control room ventilation filter housing testing. |

CLOSED

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| IFI 96-21-07 | Turbine Roll at 15% vs. 8% in ADFCS Design Documentation |
| IFI 96-21-06 | Steam pressure calculation failure in low power mode |
| IFI 96-21-07 | SGFP runback logic drawing clarification |
| IFI 96-21-10 | ECCS throttle valve position reportability |
| T4 | Digital feedwater installation to correct feedwater control reliability |

DISCUSSED

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|---|---|
| P22 | Integrated test program |

## LIST OF ACRONYMS USED

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|---|---|
| ABS | Absolute |
| ADFCS | Advanced Digital Feedwater Control System |
| ANSI | American National Standards Institute |
| AR | Action Request |
| ASME | American Society of Mechanical Engineers |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| CAACS | Control Area Air Conditioning System |
| CFM | Cubic Feet per Minute |
| CREACS | Control Room Emergency Air Conditioning System |
| DCP | Design Change Package |
| EACS | Emergency Air Conditioning System |
| ESF | Engineered Safety Feature |
| FW | Feedwater |
| INWC | Inches of Water Column |
| IR | Inspection Report |
| MCR | Modification Concern and Resolution |
| NRC | Nuclear Regulatory Commission |
| NRR | Office of Nuclear Reactor Regulation |
| PSE&G | Public Service Electric and Gas |
| PSF | Pounds per Square Foot |
| RPM | Revolutions per Minute |
| S/G | Steam Generator |
| SECL | Safety Evaluation Check List |
| SER | Safety Evaluation Report |
| SGFP | Steam Generator Feed Pump |
| STP | Special Test Procedure |
| TRB | Test Review Board |
| TS | Technical Specification |
| NOV | Notice of Violation |
| UFSAR | Updated Final Safety Analysis Report |
| USQ | Unreviewed Safety Question |