U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-387/91-06 and 50-388/91-06

Docket Nos. 50-387 and 50-388

License Nos. NPF-14 and NPF-22

Licensee: Pennsylvania Power and Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Facility Name: Susquehanna Steam Electric Station

Inspection At: Salem Township, Pennsylvania

Inspection Conducted: May 6-10, 1991

Inspector: J.M. Trapp 7-24-91
J. M. Trapp, Sr. Reactor Engineer date
System Sections
Engineering Branch, DRS

Approved by: P. K. Eapen 7/24/91
Dr. P. K. Eapen, Chief date
Systems Section, DRS

Inspection Summary: Routine Unannounced Inspection on May 6-10, 1991. Inspection Report Nos. 50-387/91-06 and 50-388/91-06.

Areas Inspected: The focus of this inspection is design, design changes, modifications, and bypass control. Also included in the scope was engineering/technical support follow-up to identified deficiencies and a review of inservice testing. The control of design changes is important to assure that modified systems continue to be capable of performing their intended safety function after the design changes are implemented.

Results: In general, the modifications reviewed were technically sound. Plant modification had been thoroughly "closed out" prior to the system being declared operable.

The Inservice Test (IST) results reviewed were acceptable, well organized and trended. However, a check valve in the containment instrument gas system "Q" boundary, was not

included in the IST program. Consequently this valve was not tested in accordance with ASME B&PV Code, Section XI as discussed in Section 4.0.

This inspection found that Engineering/Technical Support follow-up for the deficiencies reviewed, was thorough. However, one weakness was identified in the timeliness of repairs being made to the Radiation Monitoring System as discussed in Section 3.0.

DETAILS

1.0 Design Changes and Modifications Review (NRC IM 37700)

The objective of reviewing design changes (DCP's) was to ascertain that changes to the station's safety systems as described in the Safety Analysis Report were made in accordance with regulatory requirements, Technical Specifications, Station Procedures, and the licensee's Quality Assurance Program. This objective was accomplished by performing a detailed review of the following modifications:

1. 88-3032, "RHRSW Modification-Isolation Valves for RHR Heat Exchangers."

2. 88-3050A, "Replacement of RHR Pump Room Cooling Coils 2E230 A/C."

3. 89-3030, "ESW Loop "B" Supply and Return Piping Modification - Reactor Building Cooling Coils."

These design change packages (DCPs) were detailed and technically sound. In general, the DCPs reviewed incorporated requirements and standards commensurate with the safety significance of the design change involved. The thoroughness of the DCPs was also evident by the limited number of changes (PCNs) that were made to the DCPs during installation. The inspector observed:

- All design packages were adequately reviewed and approved by the plant operations review committee prior to release for installation.

- Post modification testing was performed in accordance with previously established acceptance criteria and the test acceptance criteria were met during post modification testing.

- Control room drawings had been modified in accordance with station procedures prior to declaring the modified system operable.

- Training of licensed operators on the modified plant systems was conducted prior to declaring the modified system operable.

- Station procedures were updated prior to declaring the modified system operable.

- ISI and IST Programs were revised to reflect changes in the system design. However, a formal process for assuring design changes are reflected in the IST program was not included in modification close out procedures.

One of the modifications reviewed, DCP 88-3032, incorporated the changes to facilitate a temporary fire water connection to the RHR service water system in the

event of a station blackout. This was a licensee initiative to enhance the performance of installed safety systems.

The systems engineers' active involvement in the modification process was perceived as an additional licensee strength. The system engineers provide a focal point for the modifications from inception. The system engineers interviewed exhibited detailed knowledge of the modifications performed on their assigned systems and the overall modification process. Design kickoff and installation kickoff meetings were observed to be useful efforts to enhance cooperation and communication between responsible groups. The system engineers performed an effective modification close-out process.

One deficiency was identified in the establishment of testing criteria for modification 88-3032. The RHR service water system is a ASME, Class 3 system. ASME B&PV Code, Section XI, Article IWD-5210 (b), states in part that "The contained fluid in the system shall serve as the pressurizing medium." PP&L Specification M-1040, states in section 3.8.1.3 (a), pneumatic pressure test requirements for Class 3 systems, that Class 3 water systems must be pressure tested only by means of water. For the RHR service water system the pressurizing medium is water. A one time exception was approved by engineering to perform a pneumatic pressure test in lieu of a hydrostatic test for the "hot-tapped,"3" drain connections. The failure to perform a hydrostatic test is not a plant safety issue because the pneumatic test conducted was comparable to a hydrostatic test in detecting leakage. However, the engineering assessment which allowed the pneumatic test was not thorough because it did not consider ASME B&PV Code requirements to hydrostatic test these welds.

The licensee's quality assurance audit group recently completed an audit of the plant modification system (Audit Report 91-024). This was a three week audit by a team of four auditors. The audit report concluded that the plant modifications program remains effective and satisfactorily implemented. No significant technical or design issues were identified. The audit report was reviewed and it was found to be an effective assessment of the plant modification program.

2.0 Electrical and Mechanical Bypass Control (NRC IM 37700)

The inspector reviewed the temporary modifications (bypasses) to assure that such modifications were completed in accordance with NRC requirements. Electrical and Mechanical Bypass Control procedure AD-QA-484, Rev. 3, was reviewed to verify that administrative controls for bypass control were adequate. In addition, the following two bypasses were selected to verify that the licensee was implementing these bypasses in accordance with the bypass control procedure.

- 2-91-022, "Temporary 250VDC Battery"

- 2-89-005, "Temporary Pressure Transmitter on HPCI"

The following observations were made during the review of the two bypasses listed above:

- The bypasses were reviewed and approved in accordance with the bypass control procedure.
- The bypasses were installed in accordance with the installation package.
- The records for the installation of bypasses were complete.
- Periodic reviews of the bypasses were being performed in accordance with the administrative procedures.

The total number of active bypasses for both units was less than twenty at the time of this inspection. This is a reduction from over one hundred bypasses installed one year ago. This reduction of the active bypasses indicates a strong management involvement in the control and close-out of bypasses. The reduction of active bypasses required a large engineering effort to transform the long standing bypasses into permanent station modifications. This effort provided additional reviews and incorporation of the modification into plant design documentation.

A review of AD-QA-484, Rev. 3, "Electrical and Mechanical Bypass Control," found that certain bypasses are not reviewed by PORC. To satisfy section 6.5.1.6 of the technical specifications which requires PORC be responsible for review of all proposed changes or modifications to unit systems or equipment that affect nuclear safety, the bypasses are screened by the technical section. The screening criteria are as follows:

1. If the bypass constitutes a change to the facility or procedures as described in the FSAR or it is a test or experiment not described in the FSAR, then a safety evaluation is written and PORC review is required prior to installation.

2. If the bypass does not meet the above screening criteria, it may be installed after approval by a technical supervisor and this bypass does not require PORC review.

The inspector noted that the above screening criteria were established in a revision of AD-QA-484. The previous revision of AD-QA-484 screening criteria did not provide similar guidelines for the PORC review of bypasses. The inspector observed that a small number of the older installed bypasses were not screened for review by PORC using the present screening criteria. The inspector discussed this matter with the licensee's representatives. The licensee stated at the exit meeting that the installed old

bypasses would be screened using the latest edition of AD-QA-484 and corrective actions would be taken, if needed. The inspector found this action to be acceptable.

3.0 Engineering Corrective Action Follow-up

Two licensee identified deficiencies were reviewed by the inspector to assure that engineering/technical resolutions to deficiencies were performed in a thorough and timely manner.

The Unit 2 automatic depressurization system was declared inoperable when the containment instrument gas header pressure dropped below 135 psig due to a pressure relief valve (PRV) lifting. Licensee Event Report LER 90-003 was written for the event which occurred on February 28, 1990. The LER was updated by the licensee on June 29, 1990. The licensee performed bench testing of the PRV on April 23, 1990; but could not positively identify the root cause for the PRV opening and failing to reseat. The internals of the valve were replaced and the valve was re-installed. As a long term corrective action the licensee stated that a PRV designed specifically for gas applications would be installed. The licensee has completed the installation of the improved PRV for Unit 2 and is scheduled to install a similar valve in Unit 1 during the 1992 refueling outage. The inspector found that the technical support provided to correct these deficiencies was thorough and timely.

The second licensee identified deficiency reviewed related to the corrective actions taken to enhance the vent stack radiation monitoring system (SPING). This radiation monitoring system experienced a high rate of failure. The failure of the SPING places the plant in a Technical Specification Limiting Condition of Operation (LCO). Problems with the SPING were first identified by the licensee in 1983. An NRC unresolved item regarding this issue was opened in 1985. An update of the NRC unresolved item was provided in NRC Inspection Report 50-387/90-20, at which time the schedule to start installation of the phase 1 of the SPING upgrade project was given as December 1990. At the time of this inspection, the date for phase 1 installation had been delayed until September of 1991. The engineering which has gone into the phase 1 effort appears to be extensive and addresses the problems presently experienced by the SPING. However, the delays encountered in the attempt to install this modification indicate a potential weakness in the engineering process.

4.0 Inservice Test Program (NRC IM 73756)

The scope of the IST program review was to assure that all valves and pumps which are required to be tested in accordance with ASME B&PV code Section XI are included in the IST program. In addition, the results of selected IST pump and valve tests were reviewed to assure the following:

- Acceptance criteria are met or proper corrective actions were taken.
- Tests adequately verified the design functions of the components.
- Test records are maintained.

The 1990 and 1991 quarterly core spray valve exercise data for core spray valve HV-151-F015A were reviewed. The test records reviewed were well organized and complete. The valve stroke time data were reviewed and trended by the technical support organization. The pre-establish acceptance criteria for valve stroke times were met for the data reviewed.

The quarterly core spray flow verification test data were reviewed for core spray pump 1P206A. The test procedure was found to be acceptable. The test results met pre-established acceptance criteria. The test data were well organized and trended by the technical staff. The overall IST program implementation was effective.

A review to assure that required valves and pumps were included in the IST program, was conducted for the containment instrument gas system (CIG) and for the core spray system.

The valves and pumps in the core spray system, selected for review, were adequately incorporated in the IST program. No deficiencies were identified with regard to the core spray system IST program.

The CIG system is divided into a safety related (Q) and a non-safety related section (non-Q). The safety related section of the CIG system has instrument gas bottles to provide backup pneumatic energy actuation of the main steam system safety relief valves (SRVs). The SRVs are required during accident conditions as part of the automatic depressurization system (ADS). A one inch check valve and a one inch solenoid operated valve in the CIG system provide double valve isolation between the Q and non Q portions of the CIG system. Both valves are included within the Q boundary. The solenoid operated valve is provided to close the valve on a containment isolation signal. The solenoid valve is included in the IST program and is routinely leak checked. The check valves (1-26-018, 1-26-029, Unit 1; and 2-26-018, 2-26-029 Unit 2), which are located in a ASME, B&PV Code, Section III, class 2 piping system, were not included in the IST program and were not leak tested. The

licensee has not applied for relief from testing this valve. The 10 CFR 50.55a requires that inservice testing be performed on certain ASME Code Class 1, 2, and 3 valves. Section XI Subsections IWV-1100 defines the scope of valves to be tested in terms of plant shutdown and accident mitigation. Since this check valve is required for accident mitigation it is required to be included in the IST program. The omission of this valve from the IST program is an apparent violation (Violation 50-387/91-06-01).

5.0 Unresolved Item 50-387(388)/90-08-03 (Closed)

Inspection Report 90-08 discussed a licensee identified deficiency in the main steam pipe tunnel fan wiring. The reactor building main steam pipe tunnel coolers are a non-safety related system. An error in the wiring of the main steam pipe tunnel fan resulted in the opposite fan's cooling coils functioning when the fan was in service. It also appeared that the post installation testing was inadequate to identify this concern. The licensee's immediate corrective action was to open the cooling coils service water return bypass valve and verify that one fan in service could maintain tunnel temperature. Additional corrective actions were to re-wire the fan controls to the service water valves and to survey the operators for similar type problems. The inspector reviewed Engineering Change Order (ECO) 90-6060 which re-wired the valve controls and corrected plant drawings. The ECO adequately corrected this wiring error. The results of the operators survey and the technical section's response to the survey were reviewed and found to be satisfactory. Based on the above corrective actions, this unresolved item is closed.

6.0 Exit Meeting

The inspector met with those individuals denoted in Attachment I, on May 10, 1991, to discuss the inspection findings as detailed in this report.

ATTACHMENT I

Persons Contacted

A. Licensee

* E. Bragger, Sr. Proj. Eng.
T. Creasy, Pwr. Prod. Eng.
M. Golden, Plant Eng. Supv.
* R. Harris, Sr. Results Eng.
D. McGann, Pwr. Prod. Eng.
G. Maertz, Pwr. Prod. Eng.
A. Nargoski, QA
T. Nork, Plant Eng. Supv.
* L. O'Neil, Supv. Eng.- Nuclear
R. Paley, Pwr. Prod. Eng.
* D. Roth, Sr. Compliance Eng.
R. Rarig, Tech. Asst.
D. Ritter, Pwr. Prod. Eng.
T. Sweeny, Pwr. Prod. Eng.
B. Saccone, NPE
* G. Stanley, Supt. of Plant
* R. Wehry, Compliance Eng.

B. NRC

* S. Barber, Senior Resident Inspector
B. McDermott, Reactor Engineer
* J. White, Chief, RPS 2A

*Denotes those present at the exit meeting conducted onsite on May 10, 1991.