U.S. NUCLEAR REGULATORY COMMISSION

Report No.	92-13
Docket Nos.	50-387; 50-388
License Nos.	NPF-14 NPF-22
Licensee:	Pennsylvania Power & Light Company 2 North Ninth Street Allentown, Pennsylvania
Facility Name:	Susquehanna Steam Electric Station
Inspection at:	Berwick, Pennsylvania
Inspection Conducted:	March 16 - 27, 1992

Inspector: _____ 5/6/92
Donald Caphton, Senior Reactor Engineer — Date

Approved by: _____ 5/6/92
Norman J. Blumberg, Chief — Date
Performance Programs Section
Operations Branch, DRS

Inspection Summary: Inspection conducted March 16 - 27, 1992, Inspection Report Nos. 50-387/92-13 and 50-388/92-13

Areas Inspected: Routine announced inspection to follow up on corrective actions taken in response to the maintenance team inspection (MTI) 50-387/90-81; 50-388/90-81 conducted during October 9 to November 9, 1990, with specific focus on corrective actions to identified violations, unresolved items, and weaknesses.

Results: The licensee had taken adequate corrective action on four of five MTI violations. The corrective action for the fifth violation was lacking management and quality assurance follow-up on the corrective action commitment made. The licensee took adequate corrective action for all five MTI identified unresolved items. Out of sixteen MTI weaknesses

identified, eleven of the weaknesses had been resolved at the time of this inspection. One weakness - failure to provide maintenance planners with adequate approved documents to base post-maintenance testing of ASME Code valves - was upgraded to an unresolved item. The material condition and housekeeping of the facility was found to be well maintained.

No violations were identified.

DETAILS

1.0 PERSONS CONTACTED

Attachment 1 lists the persons contacted during the inspection.

2.0 SCOPE

The licensee's corrective actions taken for five violations, five unresolved items (URIs), and sixteen weaknesses identified by the maintenance team inspection (MTI) conducted October 9 to November 9, 1990, were inspected. Cognizant people were interviewed, documentation was reviewed, the pertinent facilities and equipment reinspected, and walkdown inspections were made of the accessible portions of the plant. Licensee documentation referenced during this inspection is listed in Attachment 2. The following sections of the report discuss in order the violations, unresolved items, and weaknesses. The licensee responded by letter dated March 28, 1991, to the Notice of Violation and responded to the MTI weaknesses by letter dated April 29, 1991. The licensee's responses and the corrective actions discussed within, as well as additional corrective actions taken, were inspected. The inspector provided daily management briefings regarding the inspection findings and conducted a final exit meeting with the licensee on March 27, 1992.

3.0 VIOLATIONS

The violations are listed below corresponding to the listing and numbering in the Notice of Violation. A brief synopsis of each violation is given, followed by the inspection findings.

- Closed Violation 50-387, 388/90-81-01

  The MTI identified four examples where modifications were made without the required 10 CFR 50.59 safety evaluation. The licensee's corrective actions were verified for each example of the violation by field inspection and record review.

  a. Temporary lighting strings had been installed at the Unit 1 and 2 control rod hydraulic control units on the 719-foot levels without performing a 10 CFR 50.59 safety review. The strings had existed since before March 26, 1984. The temporary lighting was removed, and permanent lighting installed.

  b. The Unit 2 standby liquid control accumulator 2T207B charging cap had a hole drilled through the cap to allow for the connection of a Shrader valve that was too high to fit under the cap. The modification was made without a 10 CFR 50.59 safety evaluation. The standby Liquid Control Accumulator charging connection cap modification was evaluated by the licensee and found to not impact upon safety.

  c. A modification structure was installed on top of the Unit 2 main steam flow

c. A modification structure was installed on top of the Unit 2 main steam flow panel 2C041 located on the 719-foot elevation. A 10 CFR 50.59 safety review had not been performed. The temporary structure attached to the Unit 2 Main Steam Flow Panel was removed.

d. Banana jacks were installed in safety-related panel 1C611. A 10 CFR 50.59 safety review had not been performed. Engineering analysis concluded that banana jacks did not constitute a change to the facility or a modification to the circuits. A criteria document was developed, including an engineering evaluation covering harsh environmental areas to support the licensee's position. An evaluation pursuant to 10 CFR 50.59 was made to cover the installation of banana jacks. The engineering Technical Specification E 1095, Revision 0, "Installation of Banana Jack Test Connectors and Safety Evaluation" was approved on June 28, 1991. The licensee's corrective actions resolved the MTI concerns with banana jacks.

The corrective actions taken by the licensee to correct each of the four cited examples was found to be acceptable. This violation is resolved.

° <u>Closed Violation 50-387, 388/90-81-02</u>

On October 11, 1990, the MTI team identified a Unit 1 environmentally-qualified (EQ) Reactor Core Isolation Cooling Pump Rosemount 1153B discharge flow transmitter (FT-E51-1N003) cover cap that was loose. The cap was found to be torqued to 65 inch pounds.

The licensee's corrective action included checking, cleaning, and retorqueing all subject EQ Rosemount transmitter cover caps. A new procedure, IC-IE-05, Maintenance of Equipment Qualifications, was issued to provide direction for developing a Data Form containing requirements for maintaining the equipment qualification of instruments following maintenance. This new procedure outlines the requirements for maintaining the equipment qualifications for the subject Rosemount 1153B transmitters, as well as for other EQ instruments. Based upon interviews, the review of completed work authorizations, the licensee's investigation findings and the new EQ maintenance requirements procedure, this violation is closed.

° <u>Open - Violation 50-387, 388/90-81-03, renumbered 90-81-013</u>

The MTI team found that, during the period of October 1988 to October 1990, required procedural reviews and verification of approximately 2000 Unit 1 and 2 procedures, including safety-related maintenance procedures, surveillance procedures and checklists were conducted, but not in accordance with ANSI 18.7-1976, i.e., independent personnel not having responsibility for performing or directly supervising the procedure.

The licensee's response letter stated that "AD-QA-101, "Procedure Program," was revised to require a verification review of procedures by qualified personnel not performing or directly supervising the performance of the procedure at least once every two years." An inspection of AD-QA-101, Revision 20, approved August 8, 1991, failed to identify in the revised procedure the requirements for a verification review by qualified personnel not performing or directly supervising the performance of the procedure. Cognizant licensee personnel were questioned regarding this discrepancy, including the breakdown in the licensee's administrative controls/Quality Assurance processes that resulted in the failure to identify the discrepancy with their response letter commitment.

The inspector concluded that the licensee had made some changes in the procedure review and verification processes to bring the processes more closely in agreement with the requirements of ANSI 18.7-1976; however, the processes were not being procedurally driven by a revised AD-QA-101. The procedure's Periodic Review Form, Attachment M, to AD-QA-101 was deficient in its broadness for driving the review to include, for example, changes resulting from manufacture notices, GE Service Information Notices, NRC information notices and bulletins, etc. The licensee's representatives stated intent to assure both an adequate technical and administrative periodic review. The inspector noted that the procedure, as revised, specifies a periodic review at least every two years to include both the technical and administrative review. The procedure is still deficient in addressing the independence aspects of the review process as required by ANSI 18.7-1976.

Based upon the findings, the licensee's management representative committed to provide the NRC: (1) a revised response to the Notice of Violation by April 30, 1992; (2) revise the procedure by June 30, 1992, to make clear the procedure requirements including the technical and administrative review requirements; and (3) determine the root cause of why the management and administrative controls/Quality Assurance systems did not identify that the licensee's response letter specified actions were not fully implemented. This violation remains open pending review of the licensee's revised response to the notice of violation and inspection of the licensee's revised procedure and its implementation.

Closed Violation 50-387, 388/90-82-04

Two examples of a violation involving inadequately preplanned work was identified by the MTI.

a. On October 10, 1990, inadequately preplanned work was performed during the initial stages of the Unit 1 High Pressure Coolant Injection (HPCI) turbine six-year inspection. The preplanned work package procedure was not detailed enough or appropriate to the complexity of the work, and inadequacies were observed in the maintenance crew's performance.

The procedure, MT-052-002, Unit 1 and Unit 2 HPCI Turbine Maintenance, was rewritten to reflect the direct experience gained during the Unit I HPCI turbine maintenance. The maintenance crew provided input to Maintenance Engineering to assist in upgrading the procedure. Maintenance Engineering revised the procedure. The procedure was stated to have been used and worked well for the six-year inspection for Unit 2 which was subsequent to the MTI. The inspector reviewed the procedure and noted procedural improvements over that provided for the original HPCI turbine maintenance witnessed by the MTI. Although the procedure was improved, the inspector noted several places in the procedure that warranted further improvement, e.g., the wording of a footnote (1) on page five did not correspond with the asterisk locations and step 8.1.1 lacked specificity regarding exact directions (parts and part members) to be removed or the instructions/directions for maintaining control identity and care of parts removed.

The inspector concluded that the corrective action taken provided an improved HPCI turbine maintenance procedure; and, based upon this fact, the violation is closed. The inspector further noted, however, that the procedure was in need of additional work.

b. On October 11, 1990, inadequately preplanned maintenance work and test sequencing was evident by activities associated with work to replace Unit 1 service water system butterfly valves. After installation, but before torquing the flange bolts, the emergency service water pumps were restarted to perform testing for another work activity and resulted in leakage out of the incomplete torqued flange.

The personnel working on the valve were not made aware that the pumps were being started and could potentially affect their work. The licensee agreed to revise their procedures such that a notification to personnel will be made when plant conditions are to be changed. This procedure revision was in progress at the time of this inspection. Based upon this action, this violation is closed.

° <u>Closed Violation 50-387, 388/90-81-05</u>

This violation consisted of three examples where either procedures were not followed, or work was performed outside the scope of approved procedures.

a. On October 13, 1990, while performing work in Unit I under WA No. P02214, workers failed to follow Radiation Work Permit No. 90-583 and obtain a health physics (HP) survey required for every breach before opening flanges in a contaminated system.

HP had previously surveyed the initial breach of this system to establish the working conditions. The radiation work permit (RWP) clearly stated a "Survey Required Every Breach and Weekly." HP had concluded that the intent was to only require the survey during the initial breach; however, the RWP did not state this, and the workers did not follow the stated instructions. HP has revised their RWP wording for future jobs to specify a HP survey for the initial breach of piping and systems, unless determined otherwise, to avoid a similar issue in the future. Workers and HP technicians have received training regarding the subject area, including the importance of following procedures and assuring that procedures are accurate. The licensee has issued to workers a handbook (manual) to provide another means to emphasize management expectations. Included in this manual is a paragraph that covers the subject of following procedures and work plans. Prior to the Unit 1 outage, management level personnel provided briefings to all workers which included management's expectations to follow procedures and work plans and to stop and get them fixed before continuing whenever procedure or work plans were not correct. Between February 18 and March 27, 1992, 1,776 Susquehanna personnel received their preoutage management briefing. Management expectations for using and following procedures also has been issued in procedure NDAP-QA-0500, Revision 0, approved November 4, 1991. Based upon the actions taken, this example of failure to follow procedures is closed.

b. On October 11, 1990, while working in Unit 1 under WA No. S06850, technicians performed work outside of the scope and authorization of the WA by removing speed sensor connections, limit switches, position transformer and pressure sensing lines.

The level of detail in the work package was inadequate, and the technicians proceeded with the work. As discussed in the preceding example, personnel have received training regarding management's expectations to stop work whenever procedures and work plans are found to be inadequate. Instrument and Controls (I&C) have developed a new procedure IC-IS-14, Revision 0, Work Plan Development Instruction, to provide direction for the development of improved work plans for WA activities. Based upon review of the documentation, interview of personnel, and improvements in I&C work planning, this example of a failure to perform work within the scope and authorization of a WA is closed.

c. On October 11, 1990, while working under WA No. P94140, a worker failed to follow the procedure and went beyond the scope and authorization of the WA by testing the insulation resistance of the generator.

The licensee counseled the workers involved regarding working within the work scope of the WA. The licensee has provided training to workers, as noted in paragraph a. above, regarding the importance of working within the bounds of procedures and WAs. AD-QA-502, Work Authorization System, specifically addresses additions or deletions to work instructions and specifies the required review process when such changes are made. The inspector concluded that the licensee's procedures adequately addressed the issue of working within the scope of a WA. Based upon the actions taken by the licensee, this example of the violation of a failure to follow the procedure and a worker working beyond the scope and authorization of a WA is closed.

4.0 UNRESOLVED ITEMS

The MTI identified five unresolved items (URIs). These were inspected, and the findings are discussed below. The URIs are discussed and numbered in the same order as listed in Appendix 3 to the MTI report.

Closed URI 90-81-01 During walkdowns of the Unit 1, Division 2, 250-V vital battery room, an intercell connecting cable between cells 60 and 61 was noted to have a tight bend radius.

The licensee issued nonconformance report, NCR No. 90-0321, to evaluate the matter. This particular cable is welding cable, and the manufacturer did not specify a minimum bend radius. The licensee contacted the supplier of the batteries, Charter Power Systems, who reviewed the matter, including potential affect from a seismic event. Based upon the information obtained, the licensee installed ty-wraps on the interconnecting cable to potentially lessen forces that could be exerted on the battery terminals in the event of an

earthquake. The inspector reviewed the documentation and visually observed that the ty-wraps had been installed. Based on the licensee's actions taken, this URI is closed.

Closed URI 90-81-02 During walkdown inspections of the Unit 2 high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) pump rooms on October 9, 1990, the ambient room temperatures were found by the MTI to be high and were noted on occasion to have exceeded established limits. This matter was made an unresolved item, pending an SSES evaluation of possible consequences.

The licensee initiated an engineering work request (EWR 10185) to cause the identified condition to be evaluated. It was subsequently found that the condition had been previously identified and evaluated under NCR 88-0613. The licensee's evaluation shows that the average room temperatures were well below temperature that would affect the qualified EQ life; although, occasionally, the temperatures did exceed actual limits. The conclusion reached in NCR 88-0613 was that qualified life of equipment in the RCIC room was not

adversely affected by short periods above the design maximums. The licensee initiated a temperature monitoring program and stated that the data collected is periodically analyzed to determine EQ impact. The inspector reviewed temperature data from both Units. Unit 1, the operating unit, had only one temperature that spiked to 102.2°F (limit is 104°F) and the average for the period inspected (December 5, 1991, to February 26, 1992) was approximately 95°F. Unit 1, the shut down unit, was averaging approximately 82°F during the period November 27, 1991, to February 18, 1992.

The Design Standard, GDS-13, Reactor Building Temperature Monitoring, and EQ Life Extension, Revision 0, issued August 5, 1991, specified that plant personnel are responsible for data collection and maintenance of the temperature monitoring instrumentation. However, the plant currently has no procedures covering this effort. The licensee committed to establish by December 31, 1992, procedures covering data collection and maintenance of the equipment.

Based upon these findings and the licensee's commitment to proceduralize the date collection and maintenance work being performed, this unresolved item is closed.

Closed URI 90-81-03 During the MTI walkdown inspections, the team observed two fuel tanker trailers parked adjacent to the Emergency Diesel Generator (EDG) building underneath the combustion air intake structure for the four EDGs. The team viewed this practice as having potential to cause a common mode failure of the EDG. The item was unresolved pending a review of SSES's evaluation showing acceptability.

The licensee revised their procedures to make the normal unloading of tank trailers occur at the separate E-EDG building fuel unloading station. Fuel will then be pumped from the E-building fuel storage tank to the A, B, C, and D EDG tanks. The inspector verified acceptability of parking tank trailers at the E-EDG building by reviewing the fire hazards analyses. Based upon discussions, the licensee stated that the procedure would be further revised to limit the time a loaded tanker would be permitted to be parked at the E-EDG building fuel unloading station. Based upon the actions taken and being taken by the licensee, this URI is closed.

Closed URI 90-81-04 During the MTI, the Unit 2 temperature detector, TE E51-2NO22B (PYCO) in the penetration room, 670-foot level, was found to have a loose screw on the terminal cover.

The licensee's EQ engineering group reviewed the requirement which specified torquing the PYCO head covers and approved the deletion of the torque requirements, stating that the cover gaskets do not have an EQ function (reference EQEL-19-I, Revision 5, Component Information Surveillance Form). The I&C Department then reviewed the EQ engineering findings and concluded that it was a proper maintenance work practice to ensure that the head covers are properly installed. I&C generated form IC-IE-05, Maintenance of Equipment Qualifications, to specify 150 inch lbs. of torque. This torque valve was derived

from shoptesting to find a torque value that provided for properly seating the head cover. The inspector reviewed the licensee's finding and actions taken to resolve this item. Based upon the licensee's actions, this unresolved item is closed.

Closed URI 90-81-05 The Unit 2 RWCU inboard isolation valve, HV 244F001, torque switch had been misadjusted. This item was made an unresolved item pending the assurance that PP&L procedures for covering other similar cases are in place and no other similar cases exist.

The licensee's investigation concluded that the torque switch had been improperly set prior to 1986 and the cause was attributed to cognitive personnel error. A licensee review was conducted to determine if other similar Unit 1 or 2 torque switches were incorrectly set. None were reported to have been found. The HV244F001 torque switch was reset to the specified setting per WA V00473 on December 15, 1990. A review of the WA and the procedure Form MT-GM-050-4 verified that the as-left setting was at a torque setting to permit the closing of the valve against a full reactor pressure ΔP. The procedure, MT-GM-050, Rev. 2, Limitorque Operator Maintenance, provides for the proper setting of torque switches. Based upon review of the licensee's actions, this unresolved item is closed.

5.0 WEAKNESSES

The MTI identified sixteen weaknesses. These weaknesses were inspected, and were found to have been satisfactorily addressed by the licensee, with the exception of the comments discussed below. The MTI weaknesses were listed in Appendix 2 of the MTI report. The weaknesses discussed below are numbered and taken in order of their listing in Appendix 2 of the MTI report.

3.5 "The root-cause analysis program and its application to failures, including assurance that generic implications are addressed."

As discussed in the MTI report, the licensee's program did not require root-cause analysis for component failures unless they result in relatively significant events. The inspector concluded that the program has not effectively changed. For example, at the WA level, WAs are reviewed; however, root-cause type determinations are not formerly built into this review. The licensee now relies entirely upon the WA reviewers, not a structured program, to assure that the cause of a condition is adequately assessed. If a WA is classified as a Significant Operations Occurrence SOOR-1 or 2 classification, the licensee's program does require a cause analysis to be done. The SOOR is at the event level, as opposed to equipment level. A review of a Equipment Performance and Trending Analysis Report 9103, dated December 11, 1991, found very little component level trending. The finding by the MTI team continues to exist. The licensee's management indicated that future program improvements are projected that would address the subject area.

5.1 "Inadequate preplanning of work, a lack of procedural adherence, and an insufficiently detailed WA package, as observed during the HPCI turbine overhaul."

The inspector observed that there has been no effective maintenance department mechanical and electrical group self-assessment program to assess procedural adherence by the mechanical and electrical people. A program has been developed, and the maintenance management stated their intent to implement the program. There was essentially no historical self-assessment data available from this program at the time of this inspection regarding assessment of mechanical and electrical procedure compliance. I&C had an ongoing assessment program which was found to be operating effectively.

5.9 "Inadequate post-maintenance testing planning process, e.g., ASME Code components are not being identified."

The inspector reviewed and discussed with the maintenance planners the documents being used by maintenance planners upon which to base and specify post-maintenance testing (PMT) for ASME Code components (valves). Based upon the review of the documents and the interviews, the inspector concluded that this item had not been adequately resolved. For example, one document used by the maintenance planners for specifying testing for ASME Section XI, IWV Categories A and B valve testing is the Maintenance Component Matrix; however, this document is still being developed. The procedure, AD-QA-423, Rev. 10, Station Pump and Valve Testing Program, was stated by the planners interviewed not to be the document they used for specifying PMT for ASME Code valves. They stated that the system engineers used AD-QA-423; however, system engineers are not in the WA approval process. Based upon the lack of a clearly defined and approved document for the maintenance planners to base PMT of ASME Code valves and the training of the planners in the use of the document to specify PMT, this item is being upgraded from an MTI weakness to an unresolved item (URI 50-387, 388/92-13-01).

7.3 Inadequate separation of fixed-contaminated and noncontaminated tools in TBTR storage areas. Note: this item is addressed in inspection report 50-387, 388/92-12.

6.0 FACILITY WALKDOWN

Appendix 6 of the MRI, "Specifics From Walkdown Inspection" discussed a number of problem areas that were identified by plant walkdowns during the MTI. Part of Appendix 6 had discussed scaffolding deficiencies. Based on the results of the MTI walkdown inspections, the inspector specifically looked at controls for currently erected scaffolding during this inspection. The inspector observed an inspection tag on a scaffold indicating that the scaffold was approved for use. The inspection tag had a checkoff item stating that the scaffold had the required toeboards. The scaffold was missing the toeboard on the entry side having the ladder. A check of the procedure AD-QA903, Rev. 4, Scaffold Erection Review Inspection, identified that the procedure did not specify the toe board requirements. The "Scaffold Inspection Tag" is an "Attachment A" to the procedure. Item 4 was checked on

the inspection tag and stated, "Scaffold erected in accordance with applicable sections of OSHA and ANSI." The inspector observed that the missing toeboard did not comply with OSHA requirements. The inspector concluded that the procedure lacked needed requirement definition. At the exit meeting, the licensee's management agreed to upgrade the procedure to incorporate pertinent requirements by December 31, 1992.

7.0 CONCLUSIONS

In summary, the licensee continues to conduct an adequate maintenance program. The material condition and housekeeping of the facilities was well maintained. The maintenance program could be improved by instituting a proactive mechanical and electrical maintenance self-assessment program. Continued management attention is warranted in this area. Management attention is needed to focus on improving the quality of maintenance procedures (mechanical and electrical). Management controls did not assure that all of the committed-to corrective action for one violation had been completed.

8.0 MANAGEMENT MEETINGS

Licensee management was informed of the scope and purpose of the inspection at the entrance meeting conducted on March 23, 1992. The findings of the inspection were periodically discussed with licensee management during the course of the inspection. The inspector met with licensee representatives (denoted in Attachment 1) at the conclusion of the inspection on March 27, 1992. At this meeting, the inspector summarized the scope and findings of the inspection as described in this report.

Attachments:

1. Persons Contacted
2. Referenced Documents

Attachment 1

Persons Contacted

Susquehanna Steam Electric Station

Name	Position
T. Bannon	Licensing Engineer
K. Chambliss	Maintenance Outage/Production Supervisor
*T. Clymer	Coordinator, Nuclear Quality Assurance
*T. Dalpiaz	Manager, Plant Services
S. Davis	Fire Protection Engineer
*E. Figard	Manager, Nuclear Maintenance
*D. Gandenberger	Supervisor, Maintenance Production Support
*G. Glaseor	Supervisor, Maintenance
R. Hoopes	Project Manager, EQ Upgrade
*J. Kenny	Licensing Group Supervisor
*G. Kuczynski	Manager, Nuclear Systems Engineering
*R. Peal	Supervisor, Compliance
D. Roth	Engineer, Supervisor
*G. Stanley	Superintendent of Plant
*R. Wehry	Compliance Engineer
*W. Williams	Project Licensing Specialist

United States Nuclear Regulatory Commission

Name	Position
*D. Mannai	Resident Inspector

Other licensee personnel also contributed to this inspection.

*Attended exit meeting held on March 27, 1992.

Attachment 2

Referenced Documents

E1095 Rev. 0	TS for Installation of Banana Jack Test Connectors
NCR 90-0343	SBLC Acculator Charging Connections and Protective Cap
NCR 90-0342	2C041, Main Steam Flow Panel A&B
NDI-QA-9.1.1, Rev. 4	Safety Evaluations
AD-QA-120, Rev. 8	Nonconformance Reports - Control and Processing
IC-IE-05, Rev. 2	Maintenance of Equipment Qualifications
AD-QA-101, Rev. 20	Procedure Program
NDAP-QA-0500, Rev. 0	Conduct of Maintenance
AD-QA-502, Rev. 17	Work Authorization System
IC-IS-14, Rev. 0	Work Plan Development Instruction
AD-00-116, Rev. 5	Station Communications Practices and Guidelines
NCR 90-0321	250 VDC Intercell Jumper Cables, DN.2
EWR 10185, August 9, 1991	RCIC Room Exceeded 107°F
NCR 88-0613	Reactor Building Room Temperatures
GDS-13, Rev. 0	Reactor Bldg Temperature Monitoring & EQ Life Extension
	Equipment Performance and Trending Analysis Report 9103, dated December 11, 1991
AD-QA-424, Rev. 10	Significant Operating Occurrence Reports
AD-QA-903, Rev. 4	Scaffold Erection Review Inspection
MI-AD-028, Rev. 0	SSES Maintenance Department Self-Assessment Program