U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-387/80-16

Docket No. 50-387

License No. CPPR-101 Priority -- Category B

Licensee: Pennsylvania Power & Light Company

2 North Ninth Street

Allentown, Pennsylvania 18101

Facility Name: Susquehanna Steam Electric Station

Inspection at: Salem Township, Pennsylvania

Inspection conducted: June 30 - August 1, 1980

Inspectors: R M Gallo — 8/14/80
R. M. Gallo, Senior Resident Inspector — date signed

G G Rhoads — 8/15/80
G. G. Rhoads, Resident Inspector — date signed

_____ — _____
date signed

Approved by: Ebe C. McCabe, Jr. — 9/8/80
Ebe C. McCabe, Chief, Reactor Projects Section No.2, RO&NS Branch — date signed

Inspection Summary:

Areas Inspected: Routine inspection by the Resident Inspectors of: preoperational test program implementation, training instructor qualification, operating staff training, and integrated flush witnessing, and Bulletin and Circular followup. The inspectors also performed plant tours and reviewed licensee actions on previously identified items. The inspection involved 143 inspector-hours, including 13 hours during off shift, by the NRC Resident Inspectors.

Results: Of the six areas inspected, no items of noncompliance were identified in five areas; one apparent item of noncompliance was identified. (Deficiency - Failure to incorporate recirculation system flow testing into preoperational test - Paragraph 6).

Region I Form 12
(Rev. April 77)

DETAILS

1. Persons Contacted

Pennsylvania Power and Light Company

L. Adams, Plant Supervisor of Operations
R. Byram, Plant Supervisor of Maintenance
S. Cantone, Superintendent of Plant
E. Carlson, Simulator Supervisor
T. Clymer, Site QAE
T. Dalpiaz, Startup and Test Group Supervisor
D. Dunn, Resident Engineer
J. Edwards, Plant Personnel and Administrative Supervisor
R. Featenby, Assistant Project Director
E. Figard, Assistant ISG Supervisor
M. Fulkerson, Startup and Test Field Engineer
E. Gorski, Plant Quality Supervisor
M. Gorski, Resident Engineer
J. Graham, Plant Assistant
P. Kyner, Resident QAE
G. Lazarowitz, Resident Engineer
W. Lowthert, Plant Training Supervisor
K. Mertes, Startup and Test Field Engineer
L. O'Neill, Plant Technical Supervisor
J. Rimsky, Plant I&C/Computer Supervisor
D. Thompson, Assistant Superintendent of Plant
R. Webster, ISG Supervisor

The inspectors also interviewed other PP&L employees, as well as employees of Bechtel, and General Electric Company.

2. Plant Tour

The inspector conducted periodic tours of accessible areas in the plant during normal and backshift hours. During these tours, the following items were evaluated:

-- Hot Work: Adequacy of fire prevention/protection measures used.

-- Fire Equipment: Operability and evidence of periodic inspection of fire suppression equipment.

-- Housekeeping: Minimal accumulations of debris and maintenance of required cleanness levels of systems under or following testing.

-- Equipment preservation: Maintenance of special precautionary measures for installed equipment, as applicable.

-- Component Tagging: Implementation and observance of equipment tagging for safety, equipment protections and jurisdiction.

-- Instrumentation: Adequate protection for installed instrumentation.

-- Logs: Completeness of logs maintained.

-- Security: Adequate site construction security.

-- Cable Installation: Adequate precautions taken to prevent damage to installed cables.

-- Communications: Adequate public address system.

-- Equipment Maintenance and Controls: Corrective maintenance is performed in accordance with approved procedures, no unauthorized work activitjes on systems or equipment, no uncontrolled openings in previously cleaned or flushed systems or components.

Findings:

a. Fire equipment: The inspector verified on a sampling basis that licensee inspections of CO_2 and Ansul fire extinguishers had been performed on a monthly and annual basis as prescribed by National Fire Protection Association (NFPA) Code 10, 1978 Edition - Standard for Portable Fire Extinguishers and that the locking wire and seal had not been tampered with. The following extinguishers were examined:

Date	Extinguisher (Serial #)	Location
July 30, 1980	73039 (ANSUL)	Turbine Building
July 31, 1980	67455 (ANSUL)	Turbine Building
July 31, 1980	40396 (ANSUL)	Turbine Building

b. Component tagging: The inspector verified on a sampling basis that the licensee's implementation of the tag permit system was in accordance with AD-00-030 Revision 0, Protective Permit and Tag System. The following tags and tag permits were examined:

Date	Permit Number	Equipment/Breaker Number	Location
July 21, 1980	1-80-1551	Breaker 0B611-52	Control Bldg. El. 783
July 21, 1980	1-80-1551	Breaker 0B621-52	Control Bldg. El. 783
July 21, 1980	1-80-1550	Breaker 0B146-22	Control Bldg. El. 783
July 21, 1980	1-80-1571	Breaker 0B621-22	Control Bldg. El. 783
July 21, 1980	1-80-1588	Breaker 0B621-053	Control Bldg. El. 783

c. Log reviews: The following logs were reviewed for completeness on the dates indicated:

1. Startup Work List (SWL)
   (a) Residual Heat Removal System (July 14, 1980)
   (b) Diesel Generator and Auxiliaries (July 3, 1980)
2. Control Room Operator Log (June 29, 30, July 1, 22, 23, 28, 1980)
3. Shift Supervisor Log (June 29, 30, July 1, 28, 1980)
4. Supervisor of Operation Log (July 14 and July 23, 1980)

Findings relative to the Integrated Flush are discussed in Paragraph 5 of this report.

d. Security: Temporary security measures were incorporated to restrict passage onto the refueling floor (818' elevation) of the Unit 1 Reactor Building while the integrated flush was in progress. The inspector verified on July 3, July 19, July 25, and July 28, 1980 that security measures were in effect, and that no unauthorized personnel were in the areas.

e. Cable Installation: On July 28, 1980 the inspector observed insulation resistance testing of single conductor No.10 cable. The inspector verified conformance to NRC requirements PSAR Appendix D and FSAR commitments and licensee procedures. The testing was conducted in accordance with Technical Procedure TP 1.29, Revision 1. The inspector verified that calibrated test equipment was in use and that final resistance readings were as recorded. The inspector observed testing of five conductors identified as FP1Q4012A. Documentation reviewed by the inspector included:

Work Authorization 1-152B-E-80-5
PP&L Internal Letter, PLI-8716
PP&L Noncormance Report No. 80-131 .

No items of noncompliance were identified.

f. Communications: On July 18, 1980 the inspector noted that the public address system did not operate in Core Spray Room B, Reactor Building, Elevation 646. This was brought to the attention of the Assistant Plant Superintendent. A review of corrective action will be conducted during a future inspection. (387/80-16-06)

3. Licensee Action on Previously Identified Items

a. (Closed) Inspector Followup Item (387/80-01-02): Small pipe attachment not designated on P&ID. The inspector had noted that small pipe SP-DCB-102-1 was not shown as an attachment to piping P&ID DCB-102-1 Revision 5. The inspector reviewed P&ID DCB-102-1 Revision 5-F9 issued on June 4, 1980 which did designate the small pipe attachment correctly. The inspector had no further questions on this item.

4. Radioactive Sources Received at Susquehanna

On July 14, 1980 the Resident Inspector was informed by the licensee that three continuous air monitor units had been found in an onsite warehouse controlled by Bechtel Corporation. The air monitor units contained radioactive check sources. The Licensee informed the Resident Inspector that the air monitor units with sourcesinstalled had been shipped by Eberline Co. of Santa Fe, New Mexico and had been received at Susquehanna on or about February 1980. However, it was not until April 28, 1980 that the licensee had a specific by-product license (No. 37-06554-03) that permitted them to receive and possess such material. The licensee removed twelve check sources from the air monitor units and five associated calibration sets and stored them under lock and key. The inspector verified that the PP&L license included these types of sources.

Calibration Sets	Serial Number
(1) Th^{230} .005 microcuries	None
(2) Ba^{133} 1.2 microcuries	S-2126
(3) Ba^{133} .01 microcuries	None
(4) Sr-Y^{90} .005 microcuries	None
(5) Sr-Y^{90} 0.5 microcuries	S-2124

Check Sources	Serial Number
(1) Cs^{137} 30 microcuries	75154-1 No. 1
(2) Cs^{137} 30 microcuries	75154-1 No. 3
(3) Cs^{137} 30 microcuries	75154-2 No. 1
(4) Cs^{137} 30 microcuries	75154-2 No. 3
(5) Cs^{137} 30 microcuries	75154-3 No. 1
(6) Cs^{137} 30 microcuries	75154-3 No. 3
(7) Ba^{133} 0.5 microcuries	75154-1 No. 2
(8) Ba^{133} 0.5 microcuries	75154-2 No. 2
(9) Ba^{133} 0.5 microcuries	75154-3 No. 2
(10) Sr-Y^{90} 0.5 microcuries	DAI-ICC No. 481
(11) Sr-Y^{90} 0.5 microcuries	DAI-ICC No. 482
(12) Sr-Y^{90} 0.5 microcuries	DAI-ICC No. 483

Followup regarding possible noncompliance with 10 CFR 30 by the shipper has been initiated. This item (387/80-16-07) is open pending resolution of concerns over markings on the materials when received, and over licensee controls applied to assure compliance with 10 CFR 30.3 and 10 CFR 30.34(c).

5. Integrated Flush

References: (a) Technical Procedure (TP)-3.26 Revision 1 Integrated Flush.

(b) TP-2.20 Revision 0 Reactor Recirculation System Flow Testing.

(c) TP-1.16 Revision 6 System Cleanliness Verification Procedure.

The inspector reviewed references (a), (b), and (c) and observed portions of the integrated flush.

The integrated flush had two major objectives. The first objective was to complete velocity flushing of those piping systems that interconnect with the Reactor Pressure Vessel (RPV), and the second objective was to complete a series of recirculation flushes of the RPV.

The velocity flushes consisted of a series of once through flushes. These flushes utilized gravity as the motive force and were conducted away from the RPV to suitable receiving facilities or to waste. The once through flushes were intended to remove water soluble contamination and particulate matter.

The inspector observed selected activities to verify compliance with NRC requirements, the PSAR Appendix D, FSAR Commitments, and Startup and Plant Staff Procedures.

On June 30, 1980 the inspector observed that Reactor Water Storage Tank and Condensate Storage Tank level indications in the Control Room were operable. The inspector observed the tygon tubing installation used to verify suppression pool level.

During review of the SRO Log for July 1, 1980 the inspector noted that "Blue Tags" had been placed, sometime during the period June 27 - 30, 1980, on equipment to be "turned over" to PP&L prior to the formal acceptance of those systems by the Superintendent of Plant. The systems involved were 62A-Reactor Vessel and Auxiliaries, 64B.2-Reactor Recirculation System and 83F-Main Steam-Steam Flow Monitor System. The tagging of these systems prior to formal acceptance is contrary to Startup Administrative Procedure AD-6.1. PP&L NQA issued Deficiency Report (DR) No. 105 regarding this matter on July 1, 1980. The "Blue Tags" were removed until formal turnover could be completed.

A review of the licensee's corrective action will be conducted during a future inspection. (387/80-16-01)

On July 2, 1980 the inspector noted several documented discrepancies in the valve flush valve lineup sheets, Appendix C to TP 3.26. The inspector was informed that the valve lineup would be re-verified prior to commencement of the flush. On July 6, 1980 the inspector verified that the valve lineup had been re-verified on July 3 and 4.

On July 6, 1980 the inspector observed installation of blank flanges and removal of temporary pipe spools in the main steam relief lines in preparation for completion of step 7.1.3 of TP 3.26. On July 8, 1980 the inspector observed the local operation of the main steam isolation valves in preparation for the flush of main steam line "D". The inspector also observed reactor water level during the "D" line flush and verified communications were operable between the Reactor Building refueling floor and the Control Room.

During the period July 8 - 11, 1980 the inspector discussed with Plant Staff and Engineering Personnel the feedwater system valve operator problems identified during the integrated flush. The feedwater system start level control valve LV 10641, shown on P&ID M-106, had demonstrated poor reliability and was made the subject of Startup Field Report (SFR) 1259. This valve is an air operated flow throttle valve supplied by Copes-Vulcan. The most recent valve operator failure was caused by the shearing of two out of four cap screws that attach the operator base assembly to the valve yoke. The resolution of the deficiencies noted by the licensee on SFR 1259, regarding the Copes-Vulcan valve operators, will be reviewed by the NRC during a future inspection. (387/80-16-02)

On July 16, 1980 the inspector reviewed documentation regarding the results of flush cloth examinations for selected sections of the velocity flushes. The inspector noted that three flush cloth result forms were filled in and signed by the cognizant Shift Startup Engineer but the acceptable/unacceptable statement had not been marked. The steps not marked were 7.1.1 (9), 7.1.1 (12), and 7.1.4.4 (4). The Integrated Flush Lead Engineer was informed of this condition. The individual Shift Engineers were contacted and the flush forms were corrected.

On July 17 and 18, 1980 the inspectors performed a sampling inspection of valve positions in the Residual Heat Removal System and the Core Spray System. The inspectors verified the valve lineup was in accordance with the Temporary Operating Instruction for the system flush. The inspectors used P&ID drawings M-151 sheets 1 and 2 for the RHR system and M-152 for Core Spray System as reference for valve identification.

On July 17, 1980 the inspector observed conductivity meters and recorders for various points in the condensate system. The inspector noted that a chart recorder CR 12316 was providing readings that were ten times the individual conductivity meters for the same sample points. The inspector was informed that the lower readings were correct and had been verified by independent methods. The recorder was marked as having been tested in October 1979. The inspector reported the apparent discrepancy to the Plant Staff Instrumentation Supervisor for investigation.

The licensee corrected the instruction card attached to the recorder to provide for correct interpretation of recorder readings. The inspector had no further questions on this matter at this time.

On July 18, 1980 the inspector observed three flush cloth samples of the RHR system loop B. The samples met the requirements of TP 3.26 and TP 1.16.

No items of noncompliance were identified.

6. Recirculation System Flow Testing

On July 23, 1980 the inspector reviewed Technical Procedure TP 2.20 Revision 0 dated July 17, 1980. Section 1.1 of TP 2.20 states that the purpose of this procedure is to demonstrate proper system operation during actual operation of the reactor recirculation pumps and the motor-generator sets.

On July 24, 1980 the inspector received recirculation system Preoperational Test Procedure P64.1 Revision 1 dated July 22, 1980. Section 1 of P64.1 states that the objective of this test is to demonstrate proper operation of the Reactor Recirculation System. This procedure is divided into two major test sections, a logic test section and an operational test section. Section 1.1 of P64.1 describes the logic test section and states that the objective of this section is to demonstrate proper operation of system manual/automatic controls, interlocks, permissives, status lights, alarms, etc. Completion of this section requires operation of system lube oil pumps and valves, however, it does not require actual operation of the reactor recirculation pumps or the MG set drive motors and generators. Section 1.2 of P64.1 describes the operational test section and states flow testing and dynamic testing of the Reactor Recirculation System is accomplished in Test Procedure TP 2.20.

The inspector reviewed FSAR Section 14.2.12.1 Preoperational Test Procedure Abstract for test P64.1. P64.1 abstract states that the recirculation system is tested by individual and integrated operation of the motor-generator (M-G) sets, pumps and valves. It further states that performance of the M-G sets, recirculation pumps and jet pumps are determined to the extent possible during this test. In addition, FSAR Section 14.2.3.2 states that, for Preoperational Test Procedures the Test Review Board (TRB) is responsible for verifying procedure conformance with the FSAR. Plant Administrative Procedure AD-00-002 Revision 0, Section 5.2.1.1 states that the TRB members are responsible for their respective organizations review of Preoperational Test Procedures for attributes such as compliance with the FSAR.

The PP&L QA Manual Procedure SP-3, Revision 1, Section 5.4.1 states that the Preoperational Test Program shall consist of written and approved procedures which assure to the extent feasible that tests demonstrate that systems will operate in accordance with their design in all operating modes and throughout their design operating range.

The inspector determined the following regarding Preoperational Test P64.1 and Technical Procedure TP2.20: Sections 7.1 (1) through (7), 7.2 (1) through (7) and 7.3 (1) through (7) of TP 2.20 had been conducted and signed off during the period July 22 - 26, 1980; P64.1, Revision 1, does not incorporate the provisions for integrated operation of the recirculation system discussed in FSAR Section 14.2.12.1; Technical Procedures in general, including TP 2.20, are not reviewed by Nuclear Quality Assurance Personnel as are Preoperational Test Procedures; no inspections, testing or monitoring of TP 2.20 was accomplished by Station Quality Personnel.

The inspector states that the failure to incorporate recirculation system flow testing into the Preoperational Test Procedure was contrary to the requirements of 10 CFR 50, Appendix B, Criterion XI. (387/80-16-03)

The licensee's representative committed to revise P64.1 to incorporate FSAR commitments.

7. Motor-Operated Valves

a. Valve Thermal Overloads

On July 18, 1980, during the Integrated Flush the inspector observed that the power supply for the Limitorque Operator of motor operated valve (MOV) HV-1F015B in the core spray system tripped during an attempt to operate the valve. The inspector was informed that this was due to the low voltage presently being supplied by the station startup transformers and the heavy summer loads on the PP&L system. The inspector determined that the MOV overload circuits were in effect during preoperational testing. The overload protection of certain safety-related system valves is designed to be bypassed during normal plant operation. FSAR Section 8.1.6.1 discusses PP&L compliance with Regulatory Guide 1.106 regarding thermal overload protection for electric motors on motor operated valves. Valve HV-1F015B is listed in FSAR Table 8.1-1 as one of the MOV's with thermal overload protection bypassed during plant operation.

On July 28, 1980, the station startup transformer taps were set up to increase the voltage supplied to the 13.8KV buses. This was done to help prevent unnecessary circuit overloads. PP&L is presently conducting a Plant Voltage Study regarding the improvement of plant voltage conditions and is considering the purchase of larger startup transformers with automatic load tap changing (LTC) features. The Plant Voltage Study is being conducted by PP&L to determine plant voltage regulation under steady state and motor starting transient conditions during postulated accidents. The inspector noted that IE Information Notice 79-04 addressed the degradation of engineered safety features due to deficient offsite power supplies. The inspector stated that a followup review of the type of problem identified in Information Notice 79-04 would be conducted during a future inspection. (387/80-16-04)

b. Motor Operated Valve Vendor Testing

The inspector inquired if the motor operated valves which had tripped on overload during the Integrated Flush had been tested for operation at reduced voltage. The inspector was informed that a Bechtel Nonconformance Report No. 5552 had been issued to document the lack of documentation from valve vendors that the operators would provide motor accelerating capability at 80% of rated voltage. This requirement is addressed in Bechtel Specification G-7 and FSAR Section 8.3.1.9. However, NCR No. 5552 addresses only DC motor operated valves. The inspector stated that this problem could apply to the AC motor operated valves and no documentation was avail-

able to determine if this problem applied. The resolution of the testing the motor operated valves is considered unresolved pending review by the licensee. (387/80-16-05)

8. IE Bulletin and Circular Followup - Units 1 and 2

a. Discussion

IE Circulars issued to PP&L were reviewed to verify the following:

(1) Circulars received by PP&L corporate management were forwarded to appropriate individuals within the organization, including station management, for information, review and/or corrective actions as required.

(2) Licensee reviews and evaluations of circulars are complete and accurate, as supported by other facility records and by inspector observations of installed plant equipment.

(3) Corrective actions specified in internal circular evaluation memoranda have been completed and/or responsibilities have been assigned to specific individuals for completion.

b. Findings

(1) The circulars listed below, along with applicable references, have been satisfactorily dispositioned by the licensee and the inspector had no further comments on them.

(a) IEC 79-25 - Shock Arrestor Strut Assembly Interference

References:

(1) PLI-7192 dated February 27, 1980.
(2) Memorandum of telephone call on February 15, 1980, between Carl Beaulien of PP&L and Rajan Parekh of Bechtel.
(3) PP&L storeroom microfiche parts locator.
(4) Pacific Scientific Strut Bulletin PSB-1.
(5) Pacific Scientific Vendor Bulletin No. 141.

The inspector reviewed the above references to determine if the subject Bergen Paterson brackets were in use. The inspector found no evidence to indicate this bracket had been used at Susquehanna Steam Electric plant, nor that there are any in the storeroom as spares. The inspector interviewed both Bechtel Hanger Engineers and PP&L Storeroom Personnel who stated that none of the subject parts were used. This item is considered closed.

(b) IEC 80-15 - Loss of Reactor Cooling Pump Cooling

This circular was sent to the licensee for information only, and dealt with loss of reactor cooling pump cooling, and subsequent natural circulation cooldown at a PWR. The inspector confirmed that the circular had been received by licensee management, that a review of applicability had been performed, and no further action was required. This circular is considered closed.

(c) IEC 77-15 - Degradation of Fuel Oil Flow to Emergency Diesel Generator

References:

(1) PLB 9247 dated May 9, 1978
(2) PLI 3338 dated June 30, 1978
(3) PLI 8499 dated June 3, 1980

The inspector reviewed the circular and the above references. Reference (3) states that Technical Specification Surveillance requirements would require both periodic sampling of fuel oil for degradation, and a verification of flow.for the fuel transfer pump.

Reference (3) also stated that a strainer had been identified in the fuel transfer pump system. Reference (1) stated this strainer should be inspected and/or cleaned periodically. The inspector reviewed the preventative maintenance schedule for the diesel fuel oil system and could find no requirement to inspect this strainer.

This circular will remain open pending NRC review of the licensee's technical specification when submitted, and verification of a periodic inspection and cleaning of the fuel oil pump strainer.

9. Training Staff License Application Submittals

a. References:

1. NRR (H. Denton) letter of March 28, 1980 to all licensees.
2. N.W. Curtis letter of July 21, 1980 to P. F. Collins, NRC.

The inspector reviewed references (1) and (2) and held discussions with the Simulator Supervisor to ascertain the license status of licensee training Staff Instructors involved in training on systems, integrated response, transcients, and simulator courses. Two training instructors are not scheduled to have either an SRO license or their application for an exam by the August 1, 1980 deadline of reference (1). Both these instructors are recently hired personnel. The licensee intends to use them as instructors in general training areas for Plant Engineers until they have completed the SRO licensing process.

10. Preoperational Test Program Implementation Controls

a. Diesel Generators (D/G) and Auxiliaries System Turnover

1. References:

(a) Turnover package 024A.0.1 Diesel Generator and Auxiliaries
(b) FSAR Sections 8.3.1.4
(c) FSAR Sections 9.5.5 to 9.5.8
(d) Startup Manual Administrative Procedure AD6.1 Revision 6 - System/Component Turnover to PP&L
(e) P&ID M-134, Revision 6, scoped
(f) Startup Work List (SWL) for startup system 024A - Diesel Generators and Auxiliaries

The inspector reviewed references (a) through (f) and conducted tours of the diesel generator rooms on June 26, July 16, and July 24, 1980. The purpose of this inspection was to perform the following:

1. Verify that jurisdictional controls were observed for system turnover.
2. Verify turnover tagging was accomplished consistent with jurisdictional controls.
3. Verify by review of turnover logs, records and drawings that jurisdictional controls are observed.

No unacceptable conditions were identified.

On July 24, 1980 while touring D/G Room B the inspector observed portions of the performance of the jacket water leak test on D/G B. The inspector noted that a Startup Work Authorization (SWA-2433) was available at the work location, and that the testing had been properly authorized by the SWA. The inspector also noted that Quality Control Inspector was observing performance of the test, and that the procedure FCI-M-184 was in use. The inspector independently verified that no visible leakage was occuring in the jacket cooler areas of the diesel generator. No unacceptable conditions were identified.

11. Operating Staff Training

The inspectors attended a General Employee Training Session of the licensees on July 14, 1980. The session was given as a prerequisite for obtaining unescorted site access. The session covered the following areas:

(a) Fires and Fire Fighting
(b) Security
(c) Personnel Safety
(d) Quality Assurance
(e) Radiation and Health Physics Program

Written tests covering fire fighting, quality assurance, safety and health physics were given. Persons receiving a score below 70% on the quizzes are required to retake the course. No items of noncompliance were noted.

12. Unresolved Items

Unresolved items are matters about which more information is required to ascertain whether they are acceptable items, items of noncompliance, or deviation. Unresolved items disclosed during the inspection are discussed in paragraph 7b.

13. Exit Interviews

At periodic intervals during the course of this inspection, meetings were held with facility management to discuss inspection scope and findings.