

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-387/83-19
50-388/83-11
Docket No. 50-387 (CAT B)
50-388 (CAT A)
NPF-14
License No. CPPR-102 Priority -- Category --

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 28 - August 9, 1983

Inspectors: *John F. Rhoads*
G. Rhoads, Senior Resident Inspector

8/10/83
date

John F. McCann
J. McCann, Senior Resident Inspector

8/10/83
date

Approved by: *Ebe C. McCabe*
Ebe C. McCabe, Chief, Reactor Projects
Section 1D, DPRP

date
8/18/83
date

Inspection Summary: June 28 - August 9, 1983 Report 50-387/83-19; 50-388/83-11
Routine resident inspection (Unit 1 - 61 hr., Unit 2 - 138 hr.) of preoperational testing, operations, maintenance, surveillance, engineered safeguards, construction work in progress, reported events, equipment status, and open items. One Unit 1 violation was identified (Failure to maintain safety-related drawing file up-to-date, Detail 3.1).

DETAILS

1. Persons Contacted

Pennsylvania Power and Light Company

R. Beckley, Resident NQA Engineer
S. Denson, Project Construction Engineer
A. Dominiguez, Senior Project Engineer
F. Eisenhuth, Senior Compliance Engineer
H. Keiser, Superintendent of Plant
R. Prego, Operations Quality Assurance
R. Sheranko, Startup & Test Field Engineer
D. Thompson, Assistant Superintendent of Plant

Bechtel Corporation

G. Bell, Project QA Engineer
E. Figard, ISG Supervisor
G. Gelinas, Project Field QC Engineer
A. Konjura, Lead Quality Assurance Engineer
W. Mourer, Field Construction Manager

2. Licensee Action on NRC Findings

a. (Closed) Bulletin 80-21 (388/80-BU-21) Valve Yokes Supplied By Malcolm Foundary.

This item was previously closed for Unit 1 in NRC Inspection Report 50-387/82-04. It was left open for Unit 2 at that time until the work remaining under Bechtel Noncompliance Report 5980 was completed. This work was completed in October, 1982.

b. (Closed) Construction Deficiency Report (388/81-00-29) Relay Scheme Allows Lockout Feature to Preclude Restart of Swing Bus Motor-Generator (M/G).

Design Change Package (DCP 630.1) was implemented to correct this problem by:

- Adding a time delay of 17 seconds on the under frequency trip, thus allowing the diesel generators to reach operating speed.
- Changing the transfer time delay from 3 to 6 seconds, allowing the diesel generators to reach operating voltage.
- Removing the undervoltage devices from circuit breakers feeding the M/G set.

- c. (Closed) Unresolved Item (388/83-02-01) Flat Washers Not Installed On RCIC Anchor Bolts.

As a result of this item, a Bechtel Quality Action Request (QAR-8856-F0942) was generated. Closeout of the QAR required documentation and correction of the discrepant condition on the RCIC installation, as well as reviewing the installation of all other 'Q' listed ASME rotating equipment. One additional instance of missing washers was found in the installation of the Emergency Service water pumps (2P-506 A and B).

To prevent recurrence, a training session was held on February 10, 1983 to discuss the problem with mechanical engineering personnel, and review the requirements of Bechtel Specification C-815, which requires the flat washers.

The RCIC turbine installation was accepted "as-is" without the washers based on a Bechtel engineering evaluation of base plate loading, with G.E. concurrence. The ESW pump washers were added under Work Authorization WA-U-33517, which was completed on July 28, 1983.

- d. (Closed) Inspector Followup Item (388/82-12-02) Establish Guidelines To Ensure Records Can Be Retrieved After Bechtel Organization Leaves.

The licensee has developed a Quality Control Inspection Report Index which cross-references subcontractor indexes. This index is to be included in the Records Turnover Package to PP&L at the completion of the construction phase.

- e. (Closed) Construction Deficiency Report (388/81-00-07) Deficiencies In ASCO Solenoid Valves.

This item was previously reviewed during NRC Inspection 50-387/82-02 and left open pending replacement of the twelve Unit 2 valves which had been modified.

These twelve solenoid valves were replaced under Bechtel Noncompliance Report No. 7783. The work was completed in November, 1982.

- f. (Closed) Construction Deficiency Report (388/83-00-06) Improper Torquing of Shock Suppressor Pivot Mount Assembly Screws.

Licensee corrective action for this problem included the following:

- Bechtel Field Procedure FP-P-20 was revised to include a table in the "Snubber Construction Check List" delineating the torque values for each size suppressor.

- A training session was held for the Bechtel Field Engineers to emphasize the use of correct torque values.
- A Bechtel Staff Engineer was assigned to perform periodic observation of the torque crew to ensure program compliance.
- All size 10 snubbers which were installed by the individual applying the improper torque had the pivot arm assembly screws loosened and retightened to the proper torque. This work is documented under Bechtel Noncompliance Report 11102.

This deficiency was limited to one individual who failed to consult the torque instruction provided by review of the torque sheets for other size snubbers and discussions with the other torque crew members.

- g. (Closed) Construction Deficiency Reports (388/80-00-14), (388/80-00-21), (388/81-00-20) Deficiencies in Limitorque Valve Operators.

These deficiencies were collectively addressed by the licensee for Unit 2 by the development and completion of Field Procedure FP-E-11, Revision 2, "Procedure For Inspection of Limitorque Motor Operated Valves". The deficiencies described in the Construction Deficiency Reports were (1) loosening of stationary contacts on torque switches, (2) cracking of limit switch rotors, (3) cracking of torque switches. Corrective action for these items included refastening torque switches with application of "Locktite" to screws and replacement of the malamine material in the torque switches and limit switch rotors with Fibrite material recommended by the vendor. The inspector chose a random sample of 9 valve operators for review of the inspection records.

- h. (Closed) Construction Deficiency Report (388/80-00-28) Improper Grounding of PGCC Flex Conduit.

The corrective action required for this problem was specified in Field Deviation Disposition Requests UR2-561, Revisions 0 through 3, and UR2-519, Revision 4, and Field Disposition Instruction MDFQ, Revision 0. This work was completed in April, 1983.

The inspector also reviewed a Construction Quality Assurance audit of the PGCC cable grounding activities, and performed an independent sampling review of the PGCC cabinets to ensure cables and conduit were properly grounded. No unacceptable conditions were noted.

i. (Open) Inspector Followup Item (387/83-15-01) Replacement of T-10 Transformer.

On June 28 a conference call between the licensee, NRC Region I, and members of the staff from NRR was held to discuss the corrective actions planned by the licensee regarding the replacement of the Start-up Transformer which had malfunctioned on June 24. Based on this conference call, the licensee made commitments as documented in their letter to the NRC dated June 30, 1983, PLA-1735. This included replacing the transformer with a transformer which had been previously used as the startup transformer. The replacement transformer which had malfunctioned was equipped with automatic tap adjustment for voltage regulation which the older model now being used does not have. The licensee made grid adjustments to assure that the input voltage to the transformer would be regulated and controlled.

The inspector reviewed portions of the post installation test results performed under plant procedure TP-TY-003, Revision 0, and also verified that a new off-normal procedure CN-03-004, Revision 0, had been written and approved discussing operator actions on loss of the offsite power source to the T-10 transformer.

This item remains open pending review of the licensee's determination of actual cause of problem with the transformer, and the ultimate replacement of the transformer back into the system.

j. (Closed) Licensee Identified Item - "List of ISG Test Directors Has Not Been Maintained."

The inspector reviewed the current list of ISG Test Directors, which is being formally maintained in accordance with Administrative Procedure AD 10.1. Training records were reviewed for several individuals on the list to ensure that they met the requirements of AD 10.1 and the FSAR, Section 14.2. No unacceptable conditions were noted.

k. (Closed) Construction Deficiency Report (388/82-00-11) Improper Setpoint On Crosby Safety Relief Valves.

The inspector reviewed the corrected Safety Relief Valve setpoints for five valves and verified that the blowdown was between 2% and 11% of setpoint pressure for each, as recommended by General Electric.

3. Plant Operations Review

3.1 Facility Tours (Unit 1)

Regular tours were made of the control structure, turbine and reactor buildings (accessible areas), radwaste building, diesel generator building, power block yard perimeter, security building, and security fencing. The following were examined: vehicle control, portal monitoring, personnel access control and badging, radiation and high radiation area control, construction work, testing, maintenance, equipment storage and protection, shift turnover, control room staffing, instrument reading conformance to requirements, alarm and annunciator status and operator awareness thereof, equipment lineups (mechanical and electrical), housekeeping, the shift supervision and the control room operator logs, the bypass log, the incident report log, the event report log, work authorizations, and nonconformance reports.

Findings:

On July 26 while reviewing the Control Room operators log, an entry was noted which stated that on July 25 at 9:30 p.m., a Limiting Condition for Operation (LCO) was entered due to a high level in "B" drywell floor drain sump, with an inoperable containment isolation drain valve. A later entry on July 26 at 2:08 a.m., indicated the problem was resolved and the LCO had been cleared. The Assistant Superintendent of Plant told the inspector that electrical maintenance personnel had found two wires reversed in panel OC876A on elevation 806 of the control structure. The reversal of these leads effectively disrupted power to the inboard drain valve on the drywell drain sump, and the drywell equipment drain. By interrupting power, this prevented the valves from opening. On July 26 through July 29, the licensee attempted to determine how the leads may have gotten switched. A review was done of work performed in the OC876A panel and also interviews were held with personnel who had access to the Control Structure during the approximate time the leads would have been switched. A Conference Call was held between licensee management, and NRC Region I management on July 28 to discuss the event and what corrective actions the licensee was taking.

On August 5, the Assistant Superintendent of Plant stated that all interviews had been performed, that the panel had been locked, and that a list of electrical panels essential to safety was being generated and those panels would be locked. The cause of the switched leads was not identified. A procedure was developed by the licensee to verify essential safety system operability on a rush basis. Measures were initiated to more closely monitor access to areas containing essential safety equipment.

NRC review of the procedure, access control, and licensee actions to lock the electrical panels will be performed during a subsequent NRC inspection. (387/83-19-01)

During the inspector's review of this event, certain discrepancies were noted in Control Room documents. The following problems were identified:

- Stick file number 127 for drawing J653 was not being kept up-to-date with recent revisions. The stick file had Revision 4 for sheet 89 of this drawing whereas the correct Revision was Revision 7, dated June 11, 1982. It was determined that the Document Control Center (DCC) had removed this stick file from the controlled drawing file, and therefore had not been making appropriate changes to it. On July 29, the inspector informed the Superintendent of Plant that this was a violation of 10CFR50 Appendix B Criterion VI and PP&L Operational Policy Statement OPS-3, Revision 1. On August 3, the inspector reviewed stick file 127, drawing J653 and noted it had been corrected. Other control room stick files were also reviewed with no other out of revision drawings noted, showing that J653 was an isolated case.

A Design Change Package (DCP-625) had changed the capacity of the sump from around 300 gallons/sump to 150 gallons per pump in June, 1982, but the drawings had not been updated to reflect this change. On August 1, the inspector reviewed a Drawing Change Mechanism (DCM) which requested a Drawing Change Notice be initiated for the P&ID. It was noted this DCM had been initiated by the licensee on July 15, 1983, before the inspector had noted the discrepancy. On August 3, the inspector reviewed Temporary Change Notice (TCN) 1-83-1101 which changed the set-points to the Alarm Response Procedures.

On August 5 this issue was discussed with the Assistant Superintendent of Plant. The inspector stated he was concerned about how the licensee assured that changes made to the plant right before the operating license was issued were incorporated into plant drawings and procedures. This item remains unresolved pending review of licensee's system for incorporation of plant changes into procedures. (387/83-19-02)

3.2 Facility Tours (Unit 2)

The inspector made routine tours of the Unit 2 reactor building, turbine building, control structure and yard areas. Activities observed included construction work in progress, housekeeping and cleanliness controls, hot-work safety, preoperational testing in progress, equipment jurisdictional controls, in-place storage of equipment and industrial security measures. The inspector also interviewed QC, craft, and supervisory personnel during the tours.

No unacceptable conditions were noted.

4. In Office Review of Licensee Event Reports (LERs)

The inspector reviewed LERs submitted to the NRC:RI office to verify that the details of the event were clearly reported, including the accuracy of the description of cause and adequacy of correction actions. The inspector determined whether further information was required from the licensee, whether generic implications were indicated, and whether the event warranted onsite followup. The following LERs were reviewed:

- 83-083/01T-0, Surveillance Testing of Containment Radiation Monitors.
- 83-084/03L-0, Control Room Emergency Outside Air Supply (CREOASS) Fan Tripped During Surveillance Testing.
- 83-085/03L-0, Containment Isolation Valve On A Sample Line In The Containment Atmosphere Control System Did Not Close During A Surveillance Test.
- 83-087/03L-0, "A" Channel of Containment Hydrogen/Oxygen Analyzers Was Found to Have Erratic Readings and Declared Inoperable.
- 83-088/03L-0, Reactor Core Isolation Cooling (RCIC) Pump Discharge Valve Failed to Open During Testing.
- 83-089/03L-0, "B" Train of the Standby Gas Treatment System Tripped During Performance of Monthly Surveillance Testing.
- 83-090/03L-0, One of the Containment Atmosphere Monitoring Systems Hydrogen/Oxygen Analyzers Was Declared Inoperable Due to Improper Readings.
- 83-091/03L-0, Low Pressure Coolant Injection System, Loop B, of the Residual Heat Removal System Was Rendered Inoperable.
- 83-092/03L-0, One of the Two Off-Site Power Sources Was Lost Due to Transformer Winding Failure.
- 83-094/03L-0, Average Power Range Monitor Flow Biased Scram Trip Set-Point Was Less Conservative Than Required by Tech. Spec. 3.2.2.
- 83-095/03L-0, During Surveillance Testing a High Pressure Coolant Injection System (HPCI) Isolation Signal Was Received.
- 83-096/03L-0, Reactor Core Isolation Cooling System Leak Detection Logic Train "B" Experienced a Power Failure.
- 83-098/03L-0, One of the Suppression Pool-to-Drywell Vacuum Breakers Was Considered Inoperable Based on Dual Status Indication in Main Control Room.
- 83-099/03L-0, Reactor Core Isolation Cooling (RCIC) Turbine Exhaust Valve Failed Leak Rate Testing.
- 83-102/03L-0, "A" Channel of the Reactor Core Isolation Cooling (RCIC) Turbine Exhaust Diaphragm High Pressure Isolation Instrumentation Tripped And Could Not Be Reset.

5. Reactor Core Isolation Cooling System (RCIC) - Unit 1

In March the licensee reported that a 10 Amp fuse providing power to the RCIC Topaz inverter, used when operating RCIC from the Remote Shutdown panel, had blown. The Licensee Event Report (LER 83-36) stated that a plant modification could be performed replacing the 10 amp fuse with a 20 amp fuse. Since that time, the fuse size had not been replaced and on three separate occasions, the fuse has been found blown. On August 3 the inspector discussed this item with members of the Plant Technical Staff to determine why the modification stated in the LER had not been completed.

The sequence of events has been as follows:

- February 26 - Fuse F9 was found blown, and was replaced.
- March 30 - PMR 83-201 was written requesting fuse be changed from 10 amp to 20 amp capacity.
- May 16 - PMR was dispositioned as not approved and requested that the plant staff perform test to get in-rush current data on the inverter.
- May 26 - A Work Authorization (WA-S38358) was written to get in-rush currents using an oscilloscope.
- July 14 - Fuse F9 found blown again - replaced with another 10 amp fuse.
- July 14 - WA-S38358 from above (May 26) finally performed, but no usable results could be obtained.
- July 24 - Fuse F9 blown/replaced again.
- July 27 - Work Authorization (WA-38477) written to hookup recorder to monitor in-rush currents.
- July 31 - Fuse F10 blown and replaced with 10 amp fuse.
- August 2 - Recorder hooked up per WA-38477.

On August 5 the inspector discussed this sequence of events with the Assistant Superintendent of Plant and stated that it appeared to be an example where inadequate management control of a known plant deficiency had resulted in a relatively simple problem not being corrected for about six months. The resolution to this problem will be followed during a subsequent NRC inspection. (387/83-19-03)

On August 2 and 3, the inspector reviewed maintenance performed on the RCIC System to resolve a problem which has resulted in RCIC overspeeding on two separate occasions in the past. The Work Authorizations (WA-S34878 and WA-S34752) discussed machining the governor valve piston to get a clearance of .007 " between the piston and adjusting the stroke of the valve by making adjustments to the spring. During the licensee's review of the problem, they noted that a G.E. Field Deviation Instruction (FDI) should have already been completed under Work Authorizations WA-U11407 and WA-U24650 to make the necessary clearances on the valve piston. A Nonconformance Report (NCR 83-760) has been written to determine why the FDI had not been completed. The disposition of this NCR will be reviewed during a subsequent inspection. (387/83-19-04)

A quick start of the RCIC system was performed on August 4 with acceptable results. Another quick start is planned for the week of August 8 to verify the RCIC fixes had taken care of the overspeed problems.

6. Surveillance Testing (Unit 1)

The inspector observed surveillance to verify that testing had been properly approved by shift supervision, control room operators were knowledgeable regarding testing in progress, approved procedures were being used, redundant systems or components were available for service as required, test instrumentation was calibrated, work was performed by qualified personnel, and test acceptance criteria were met. The following test was observed:

Surveillance SO-51-001, Monthly Alignment Verification Core Spray System.

No unacceptable conditions were noted.

7. ECCS System Walkdown (Unit 1)

On August 4 the inspector independently verified operability of the High Pressure Coolant Injection System by performing a complete walkdown of accessible portions of the system. The walkdown included the following:

- Confirmation that the licensee's system check-off list matched plant drawings and as-built configurations.
- Identification of equipment conditions.
- Inspection of breaker interiors.
- Verification of properly valved-in instrumentation.
- Verification of valve position, breaker position, and locking mechanisms.

The following discrepancies were noted:

- Two valves, 155015 and 155F014, were locked but the licensee's valve check-off list (COL-OP-52-001-2, Revision 4) did not indicate these valves should be locked.
- Two other valves, 156F025 and 156F026, had the manual operators locked but again the COL did not so indicate.
- Two valves, HV1F059 and HV1F011, local indicators were not indicating properly.
- Four valves were missing name tags (1RV-P1-15606, 156002, 156005, and 1RV-P1-15609).
- One valve, 155041, was not listed on the check-off list. The vent valve was found in the proper position (Closed) with its operator locked and the downstream line capped.
- One valve, 155040, a redundant drain valve to local switches, LSH-1N015A and B, was found in an improper position (open vice closed). The valve was closed by the operator accompanying the inspector after verifying with the control room that the valve should be closed. The inspector reviewed the system drawings, and verified that system operability was not affected.

Licensee corrective actions for noted discrepancies will be reviewed during a subsequent inspection. (387/83-19-05)

8. Reactor Vessel Internals Installation (Unit 2)

The inspector frequently observed Reactor Internals work in progress during the inspection period. Specific activities observed on a sample basis included installation of feedwater spargers, welding of feedwater sparger end brackets and core spray junction box covers, installation of control rod guide tubes and control rods, installation of control rod drive mechanisms, installation of top guide, wedges and keepers, and instrument installation for jet pump vibration testing. The following items were noted during work observation:

- Approved installation procedures were available and in use at the work location.
- Appropriate rigging and handling precautions were taken while equipment was being moved.
- Quality Control inspection requirements were met.
- Installations were in accordance with specifications of the FSAR.
- Protective coverings were installed as required.
- Test and measuring equipment was properly calibrated.
- Cleanliness and housekeeping requirements were in effect.
- Tool control was adequate.
- Personnel were trained and knowledgeable.

On July 17, while retrieving a tool dropped into one of the control rod guide tubes, other debris was found at the bottom of the tube. Further inspection revealed debris laying on top of the control rod velocity limiters in 18 of the 185 guide tubes. The debris consisted of items such as grinding wheels, wood splinters, cable tie-wraps, and cotton gloves. Licensee action taken in response to this incident included pulling each of the control rods out of the guide tube and removing all debris, checking the overhead crane to ensure that it is not the source of debris, attempting to determine which site organization uses grinding wheels of the type found in the vessel, and stationing additional, roving security personnel in the refueling floor to be alert for any violations of the cleanliness requirements and inspection of other areas where debris could have been placed.

9. The inspector discussed this issue at length with licensee management, and requested that additional information be provided to verify that the incident resulted in no damage to the control rods on control rod guide tubes. A licensee representative stated on July 20, that the condition was being considered potentially reportable under 10CFR50.55(e), and that the additional information would be provided in that context. The licensee made a telephone report to the NRC Region I office on July 22, 1983, describing this problem. This item will be tracked by NRC as Potential Construction Deficiency Report (388/83-00-10).

The inspector also reviewed the preliminary results of the jet pump cavitation vibration testing performed to determine the effects of the cavitation of the recirculation pumps which occurred during the IHSI program. This information was documented in General Electric Report No. Y1003B2001, Revision 1. The report indicated that a conservative jet pump fatigue usage factor of 0.12 may have resulted from the total cavitation time, including 1.5 hrs. from the test. A more realistic approximation, which accounts for the water temperature effect on its elastic modulus, would give a fatigue usage of 0.06. Based on discussions with the senior G.E. site representative, expected fatigue usage of the jet pumps over plant life would have been conservatively 0.7, and therefore no material replacement is considered necessary at this point. The final report on this testing will be reviewed by NRC. This item is being tracked as Potential Construction Deficiency Report (388/83-00-05).

10. Maintenance Activities (Unit 2)

The inspector witnessed the work associated with the pump shaft replacement on the 'C' RHR pump on a sampling basis. The shaft was replaced because of excessive "run-out", or bowing.

The work was accomplished in accordance with procedure MT-49-001 (Revision 1), "RHR Pump Disassembly and Reassembly". Specific portions of this work witnessed included parts of the installation of the first, second and third impeller stages, rigging and handling during pump installation in the system, and motor-pump alignment procedures. Only minor and infrequent procedure changes were required to satisfactorily perform the work, indicating that the procedure was generally well written. These changes included disregarding the Class 'B' cleanliness and Health Physics requirements of the procedure since the portion of RHR piping where the pump is installed had not yet been flushed and there is no Radiological Contamination in Unit 2 systems. These changes were only temporary since both of the requirements will apply during the operations phase, for which the procedure was written. Specific items observed by the inspector included the following:

- The approved procedure was available and being followed.
- Personnel performing the work were trained and knowledgeable.
- Quality Assurance personnel were reviewing this work on a sampling basis, and were frequently seen at the work site.
- Measuring equipment was calibrated.
- Required procedure changes were properly processed.
- Quality Control hold points were established and observed.

No unacceptable conditions were noted.

11. Preoperational Testing - Unit 2

The inspector reviewed Preoperational Test Procedure P251.1A, "Core Spray", Revision 0, to verify that:

- The test was properly reviewed and approved.
- Test objectives and acceptance criteria were in accordance with Chapter 14 of the FSAR and other licensee commitments.
- Test procedure was technically adequate to demonstrate that acceptance criteria were met.

The test objectives for this test did not include demonstration of acceptable core spray pump flow rates, NPSH, or core spray pattern. These are demonstrated in Test P251.2A, which will be reviewed as part of the routine inspection program.

The following documents were referenced for this procedure review:

- Final Safety Analysis Report (FSAR).
- Draft Revision to FSAR describing changes for Unit 2 test program.
- Bechtel Drawing No. M-2152.
- Bechtel Drawing No. E-155, Sheets 10 through 18.
- Bechtel Drawing No. E-156, Sheets 5 through 8.
- Bechtel Drawing No. E-185, Sheets 40 and 41.
- G.E. Elementary Diagram 791E419AE (Bechtel Drawing No. M-E21-20).
- G.E. Preoperational Test Specification 22A2271AX.

During the core spray logic review, the inspector noted errors in the G.E. Elementary Drawing for each core spray pump start logic. These drawing errors were similar, and involved referencing the Unit 1 Diesel Generator output breaker contacts instead of the Unit 2 breakers. Field Change Requests were immediately initiated to correct the drawings.

The inspector also noted that the words "High flow setpoint" in Acceptance Criterion 2(7)(d) should say "low flow setpoint". The Test Director initiated a test change notice to correct this.

No unacceptable items were noted.

The inspector witnessed portions of the Individual Rod Position Indication System Preoperational Testing (P256.1A). During this testing, the inspector noted that:

- System/Component level prerequisites were met.
- Test Engineer was using latest approved revision of the procedure.
- Quality Control personnel witnessed required portions of the test.

The inspector noted that indication for the rod in the upper right-hand corner of the 4-rod display was oscillating between position 00 and 02. The test engineer stated that the problem had been identified to the computer engineers, and was documented on a Work Authorization for correction. The inspector verified that the problem was documented under Work Authorization UA-W-36493.

No unacceptable conditions were noted.

12. High Pressure Coolant Injection (HPCI) Pump Testing (Unit 2)

The inspector observed initial testing of the HPCI Turbine at various times during the inspection period. The initial runs are performed as functional tests, and are done prior to preoperational testing of the system. The turbine run tests observed were all performed with the pump uncoupled from the turbine. Water for the barometric condenser, which is normally supplied by the pump discharge flow, was supplied by service water, and turbine steam was supplied from the Unit 2 temporary auxiliary boiler.

The inspector noted the following items:

- An approved Vendor Technical Manual was available and in use during the procedure.
- Personnel conducting the test were knowledgeable.
- Pre-requisites for turbine operations, including suppression pool level and lube-oil temperature were met prior to running the turbine.
- Quality Assurance personnel were reviewing the activity on a sampling basis and were frequently present.
- Instrumentation and test equipment in use were calibrated.

During the testing conducted on July 1, at a turbine speed of about 4,000 RPM, vibration measurements were taken in accordance with the test procedure. A displacement of 2 mm was measured at the shaft coupling to the pump. The expected maximum specified by the Vendor Technical Manual is 2.0 mm. Since the resonant frequency of the turbine is about 2,000 RPM, and 4,000 RPM would therefore be the first harmonic frequency, the test engineer decided to increase turbine speed slightly to see if the vibration amplitude would decrease. Turbine speed was increased to about 4,350 RPM while vibration measurements continued. A maximum displacement of 3.5 mm was reached and the test engineer ordered the turbine secured.

On July 19, HPCI turbine vibration testing was again performed. A modification to the shaft coupling had been made in the interim to reduce possible shaft imbalance. The vibration testing was satisfactorily completed with 1.6 mm measured at 4,100 RPM. The turbine speed was then increased to verify operability of the overspeed trip mechanism. The trip setpoint was 5,160 RPM. The turbine speed was very gradually increased to 5,280 RPM and when the turbine had still not tripped by that point, speed was reduced and the turbine secured. The inspector was later informed by the start-up test director that the overspeed trip was re-adjusted and successfully tested on July 20.

No unacceptable conditions were noted.

13. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. Unresolved items are discussed in Sections 3.1, 5, and 7.

14. Exit Interview

During the course of this inspection, meetings were held with H. Keiser to discuss the inspection and findings. No written material was given to the licensee during the inspection period.