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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-334/85-06

Docket No. 50-334 License No. CPR-66

Licensee: Duquesne Light Company
One Oxford Center
301 Grant Street
Pittsburgh, Pennsylvania 15279

Facility Name: Beaver Valley Power Station, Unit 1

Location: Shippingport, Pennsylvania

Dates: February 20 - March 20, 1985

Inspectors:

Wm Troskoski
W. M. Troskoski, Senior Resident Inspector — 3/25/85 date

Wm Troskoski for
D. M. Johnson, Resident Inspector — 3/25/85 date

G. W. Meyer
G. W. Meyer, Project Engineer — 4/9/85 date

Approved By:

L. E. Tripp
L. E. Tripp, Chief, Reactor Projects
Section No. 3A, Reactor Projects
Branch 3 — 4/9/85 date

Inspection Summary: Inspection No. 50-334/85-06 on February 20 - March 20, 1985.

Areas Inspected: Routine inspections by the resident inspectors (208 hours) of licensee actions on previous inspection findings, plant operations, housekeeping, fire protection, radiological controls, physical security, engineered safety features verification, problem identification system, surveillance activities, maintenance activities, Offsite Review Committee, licensee event reports, and the maintenance program.

Results: No violations were identified.

DETAILS

1. Persons Contacted

J. J. Carey, Vice President, Nuclear Group
R. J. Druga, Manager, Technical Services
T. D. Jones, General Manager, Nuclear Operations
W. S. Lacey, Plant Manager
J. D. Sieber, General Manager, Nuclear Services
N. R. Tonet, General Manager, Nuclear Engineering & Construction Unit
J. V. Vassello, Manager, Nuclear Safety

The inspectors also contacted other licensee employees and contractors during this inspection.

2. The NRC Outstanding Items (OI) List was reviewed with cognizant licensee personnel. Items selected by the inspectors were subsequently reviewed through discussions with licensee personnel, documentation reviews and field inspection to determine whether licensee actions specified in the OI's had been satisfactorily completed. The overall status of previously identified inspection findings were reviewed, and planned and completed licensee actions were discussed for those items reported below:

(Open) Unresolved Item (81-20-02): Review DLC corrective action for high background level of liquid waste effluent rad monitor (RM-LW-104). Technical Specification 3.3.3.9, Radioactive Liquid Effluent Monitoring Instrumentation, requires the operability of RM-LW-104 whenever that pathway is used for an effluent release, or (1) a double sample analysis and (2) an independent verification by two technically qualified personnel of the release rate calculation and discharge valve lineup. Through a review of OM 1.17.4W, Liquid Waste Discharge Cooling Tower Blowdown, and Radioactive Waste Discharge Authorizations, the inspector verified that RM-LW-104 is proven to be operable prior to a discharge by performance of a source check. When the background level approaches an unacceptably high level (about 10,000 cpm), a backflush is performed to back the meter indication down from the trip setpoint. Through discussions with Operations personnel, the inspector determined that the only apparent problem with the above methodology occurs during the discharge from a relatively high level source tank (such as LW-TK-7A and B), when the rad monitor usually initiates a trip at the end of the release due to crud buildup.

Through a review of the ORC Audit and Inspection Subcommittee minutes of January, 1985, the inspector determined that DCP 453 was issued in March, 1982, to eliminate the crud trap in the sample line which results in unacceptably high background radiation levels for RM-LW-104. However, it appears that the DCP had not been budgeted or assigned. The AIS recommended either the prompt DCP implementation or the formulation of a new position to resolve this issue. This item, therefore, remains open.

(Closed) Unresolved Item (82-16-09): Resolve requested deviation from environmental qualification of containment high range monitor. In a previous inspection of the installed containment high range radiation monitors (RM 219 A and B), it was determined that the environmental qualification of the control room instrumentation had not yet been completed. The licensee requested a deviation from the environmental qualification of the cable splices in a letter to NRR dated March 19, 1982. Since then, the high range radiation monitors installed under DCP 303 have been successfully qualified to the requirements and intent of IEEE Standard 323 - 1974, IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Station. The inspector reviewed Test Report No. 46880 dated August 30, 1984, and verified that an independent test laboratory (Wyle) conducted tests of Raychem Corporation's environmental sealing kit and cable insulation repair kits that were used in DCP 303. The inspector had no further questions and this item is closed.

(Open) Inspector Follow Item (82-24-01): Followup on TMI required containment wide range pressure monitors. This item was left open pending submittal of a technical specification change to add these monitors to the accident monitoring instrumentation table, and to upgrade the pressure transmitters to IEEE 323-1974, Environmental Qualification Standards, when equipment is available. From a review of operating license change request No. 94, dated October 8, 1984, the inspector determined that the licensee had requested a deviation from the model technical specifications provided by Generic Letter 83-37. This item is currently under review by NRR, which has jurisdiction over such matters, and is thereby closed. The second part of the item concerning upgrade of the pressure transmitters to IEEE 323-1974 remains open pending review of acceptable equipment qualification test reports.

(Closed) Unresolved Item (84-02-02): Control of ISI Program examination samples. The licensee's ISI Program allows the substitution of a weld scheduled for inspection to be made in the event that it cannot be examined due to physical constraints as determined by the plant operator and maintenance personnel. Though those sample changes were properly made on the basis of code requirements, no written procedure had been established to control this activity. The inspector reviewed OQC-ISI 3.0, Ten Year Inspection Plan, Rev. 0, Section 5.4.2, which permits the Quality Control Engineer to interchange the period of inspection for any 10 Year Plan item as long as the percentage of completed inspections for each period is maintained as specified in the 10 Year Plan for the inspection category in question. This is acceptable and the item is closed.

(Closed) Unresolved Item (84-02-03): Restrictive access examinations. When access to pipe welds is restricted by pipe supports or hangers, the 10 Year Plan requires the examination to be performed to the extent practical, unless removal of the support is permissible. No procedure had been available to govern how this determination is made. From a review of OQC-ISI 3.1, Administration of the 10 Year Plan, Section 5.4.1, the inspector determined that the addition or deletion of any item from the 10 Year Plan is required to be fully documented prior to any revision of the plan. This documentation provides the justification for the commitment change, and is forwarded to the Quality Control Engineer for any revisions necessary to the 10 Year Plan. The inspector had no further concerns and this item is closed.

(Closed) Unresolved Item (82-08-03): Review licensee action per IEB 79-14, Seismic Deficiencies (LER: 82-07, -08, -11, -12). A detailed review of this area was performed during NRC Inspection Report 50-334/83-21. Concerns identified as a result of that inspection are being tracked as Unresolved Items 83-21-01 and -02. Since this item is redundant to those concerns, it is administratively closed.

(Closed) Unresolved Item (83-19-03): Identify cause of apparent RCS boron dilution of September, 1983. Incident Report 83-51 addresses this item and was reviewed by the Maintenance and Operation Subcommittee of the ORC during the March 6, 1985, meeting. The MOS determined that the root cause of the low RCS boron concentration was due to blender operation and not the boron sampling and analysis method as originally reported. Currently, OM 1.55B.4, Periodic Checks, requires a monthly performance check of the blender by verifying blender discharge concentration when the plant is in Modes 1 thru 4. As this problem appears to have recurred during the last refueling outage, the licensee is currently considering whether to expand this performance check for all modes. Followup on this is Open Item (85-06-01).

(Closed) Unresolved Item (84-12-03): Ensure valves are not prestroked prior to testing for containment isolation times. The inspector reviewed completed copies of OST 1.1.10, Cold Shutdown Valve Exercise Test, and OST 1.47.3A, Three Month Containment Isolation and ASME Section XI Test, and verified that guidance had been added to preclude stroking of valves prior to time measurement. This should assure that actual as-found containment isolation times are compared to appropriate acceptance criteria and corrective maintenance initiated for any valve with a closure time outside of the limits.

(Open) Unresolved Item (84-15-02): Provide schedule and basis for frequency of line starter PM Program. The Maintenance and Operation Subcommittee of the ORC is currently investigating the use and scheduling of preventative maintenance activities under Item MOS 83-1/A4-1. This item reamins open pending final program development by the licensee.

(Closed) Violation (85-03-01): Failure to set three pressurizer level channels with allowable values specified in Technical Specification 2.2, Limiting Safety Systems Settings. As discussed in Inspection Report 50-334/85-03, the pressurizer water level trip ensures protection against reactor coolant system overpressurization by limiting the water level to a volume sufficient to retain a steam bubble and prevent water release to the pressurizer safety valve. The BVPS Unit 1 accident analysis takes no credit for the operation of this trip. After discussing this item with the licensee during the Enforcement Conference on February 13, 1985, NRC Regional Management determined that it meets the criteria of 10 CFR 2, Appendix C, as a licensee identified violation. The inspector verified that appropriate revisions to the test procedures (MSP 6.41, -42, -43, Pressurizer Level Protection Channel Calibration) have been completed. No further action is required and this item is closed.

(Open) Unresolved Item (85-02-05): Determine why administrative controls did not prevent the unexpected operation of the condensate pump recirc valve. On February 15, 1985, the plant experienced a feedwater transient that resulted in a manual power reduction by Operations personnel to avoid exceeding DNB parameters. Initial observation of the licensee's response to the event and independent verification of technical specification compliance is documented in NRC Inspection Report 50-334/85-02. Further review was conducted by the inspector to determine what administrative controls broke down to allow the inadvertent operation of the condensate pump recirc valve (FCV-CN-101), which required operator response to avoid an unnecessary challenge to safety systems.

Discussions with test personnel indicated that flow transmitter FT-CN-101-3 had been scheduled for change out during the fourth refueling outage under DCP 129, SG Blowdown Demineralizers. Because the transmitter was replaced with one that did not have a sufficient range, it had to be replaced again while the plant was operating; an evolution that should present no hazard to personnel or equipment. After obtaining an equipment clearance on the portion of the instrument air system associated with FT-CN-101, the job was walked down on February 14, 1985. At that time, the valve actuator was removed from FCV-CN-101 due to unrelated work. Test personnel stated that they would have requested the same clearance points, regardless of whether or not the plant was on line. It is Operation's responsibility to decide if the work can be done under current plant conditions, and that the clearance adequately prevents unwanted system interactions. After signing "off-log only," test personnel isolated the instrument air to FT-CN-101-3 on February 15, 1985, and hooked up the dead weight tester to complete calibration. It was at this time that FCV-CN-101 unexpectedly operated (it had been returned to service the night before).

The inspector reviewed Instrument Transmitter Rack Print AA 8700-RK-6B. The print erroneously showed a straight run of line from the instrument air isolation valve to FT-CN-101-3; it did not show a branch-off to FT-CN-101-2, which also sends a control signal to FCV-CN-101. The two transmitters are of different ranges and are selected through a logic system that differentiates between one or two condensate pump operation. By isolating air to both transmitters, the recirc valve went to full open which resulted in a significant decrease in feedwater flow to the steam generators. The licensee's representative stated that an Engineering Memorandum would be issued to correct the print error.

The actual transmitter calibration had been conducted under a generic station field calibration procedure, CP-020, Calibration of Pneumatic Differential Pressure Transmitter, approved February 2, 1978. Unlike station loop calibration procedures, specific control flow diagrams are not shown. Hence, it is up to test personnel to use controlled prints to verify that the desired work can be performed under an approved equipment clearance.

The inspector noted that the Technical Advisory Group was conducting an incident review of this event. This item remains open pending the conclusion of that review to determine why the instrument air print did not reflect as-built conditions and what further corrective actions might be needed.

(Closed) Unresolved Item (84-12-04): Review of current safety practices for work on electrically "hot" cabinets. This item was opened for an inspector concern dealing with I&C technician work in energized electrical cabinets, that may cause damage or personnel injury due to events such as unintentional grounding. This item was discussed again in Inspection Report 50-334/84-33 when a similar event occurred during work in an energized emergency diesel generator load sequencer.

I&C personnel were briefed in safety meetings that dealt with the concerns addressed above. Since the majority of I&C work is done on energized circuits ($\leq$120V), the primary method of eliminating problems is by use of careful, cautious work practices. The inspectors reviewed the training rosters to verify that I&C personnel had been briefed about work in energized safety related circuits, and were aware of the potential problems. The inspectors feel that this concern has been properly addressed and this item is closed.

3. Plant Operations

a. General

Inspection tours of the plant areas listed below were conducted during both day and night shifts with respect to Technical Specification (TS) compliance, housekeeping and cleanliness, fire protection, radiation control, physical security and plant protection, operational and maintenance administrative controls.

-- Control Room
-- Primary Auxiliary Building
-- Turbine Building
-- Service Building
-- Main Intake Structure
-- Main Steam Valve Room
-- Purge Duct Room
-- East/West Cable Vaults
-- Emergency Diesel Generator Rooms
-- Containment Building
-- Penetration Areas
-- Safeguards Areas
-- Various Switchgear Rooms/Cable Spreading Room
-- Protected Areas

Acceptance criteria for the above areas included the following:

-- BVPS FSAR
-- Technical Specifications (TS)
-- BVPS Operating Manual (OM), Chapter 48, Conduct of Operations
-- OM 1.48.5, Section D, Jumpers and Lifted Leads
-- OM 1.48.6. Clearance Procedures
-- OM 1.48.8, Records
-- OM 1.48.9, Rules of Practice
-- OM Chapter 55A, Periodic Checks - Operating Surveillance Tests
-- BVPS Maintenance Manual (MM), Chapter 1, Conduct of Maintenance
-- BVPS Radcon Manual (RCM)
-- 10 CFR 50.54(k), Control Room Manning Requirements
-- BVPS Site/Station Administrative Procedures (SAP)
-- BVPS Physical Security Plan (PSP)
-- Inspector Judgement

b. Operations

The inspectors toured the Control Room regularly to verify compliance with NRC Requirements and facility technical specifications (TS). Direct observations of instrumentation, recorder traces and control panels were made for items important to safety. Included in the reviews are the rod position indicators, nuclear instrumentation systems, radiation monitors, containment pressure and temperature parameters. onsite/offsite emergency power sources, availability of reactor protection systems and proper alignment of engineered safety feature systems. Where an abnormal condition existed (such as out-of-service equipment), adherence to appropriate TS action statements were independently verified. Also, various operation logs and records, including completed surveillance tests, equipment clearance permits in progress, status board maintenance and temporary operating procedures were reviewed on a sampling basis for compliance with technical specifications and those administrative controls listed in paragraph 3a.

During the course of the inspection, discussions were conducted with operators concerning reasons for selected annunciators and knowledge of recent changes to procedures, facility configuration and plant conditions. The inspector verified adherence to approved procedures for ongoing activities observed. Shift turnovers were witnessed and staffing requirements confirmed. Except where noted below, inspector comments or questions resulting from these daily reviews were acceptably resolved by licensee personnel.

(1) On February 20, 1985, the reactor was manually shutdown at about 6:15 a.m. in accordance with administrative guidelines when steam generator conductivity approached 19 umhos. After plugging a failed tube, the reactor was restarted at about 8:15 a.m. on February 21, 1985. During the restart activities, a trip occurred due to a high level in the C steam generator. The licensee had been experiencing difficulty in balancing steam flow and feed flow due to main condenser vacuum problems because two out of the four water boxes were isolated (to search for the leaking condenser tube), and erratic behavior of the steam dump control system, when in the automatic mode. All safety systems functioned correctly. The inspectors observed portions of the restart effort and no further problems were noted.

(2) The licensee began experiencing steam generator conductivity problems again on February 28, 1985. After exceeding the administrative guideline of 7 umhos, primary power was reduced to about 35%. When it became apparent that the leaking condenser tube could not be readily identified and conductivity continued to increase, the plant was placed in Mode 2 (less than 5% thermal power) at about 8:45 p.m. on March 1, 1985. After identifying and removing the failed tube, the reactor was returned to Mode 1 at about 6:15 a.m. on March 4, 1985. The inspector observed startup activities to verify compliance with Technical Specifications and administrative controls. No concerns were identified.

During the fourth refueling outage that ended in January, 1985, the main condenser had been completely retubed with a ferric alloy to alleviate manganese underpitting caused by river water chemistry. Apparently, other modifications performed on the main condenser served to increase vacuum and has resulted in the steam approaching sonic velocities which in turn causes tube vibration and subsequent failures. Plans for corrective action including a one-to-two week maintenance outage are currently under development to resolve the continuing tube failure problem.

c. Plant Security/Physical Protection

Implementation of the Physical Security Plan was observed in the areas listed in paragraph 3a above with regard to the following:

-- Protected area barriers were not degraded;

-- Isolation zones were clear;

-- Persons and packages were checked prior to allowing entry into the Protected Area;

-- Vehicles were properly searched and vehicle access to the Protected Area was in accordance with approved procedures;

-- Security access controls to Vital Areas were being maintained and that persons in Vital Areas were properly authorized;

-- Security posts were adequately manned, equipped, and security personnel were alert and knowledgeable regarding position requirements, and that written procedures were available; and,

-- Adequate lighting maintained.

No inadequacies were observed.

d. Radiation Controls

Radiation controls, including posting of radiation areas, the condition of step-off pads, disposal of protective clothing, completion of Radiation Work Permits, compliance with Radiation Work Permits, personnel monitoring devices being worn, cleanliness of work areas, radiation control job coverage, area monitor operability (portable and permanent), area monitor calibration, and personnel frisking procedures were observed on a sampling basis. No inadequacies were noted.

e. Plant Housekeeping and Fire Protection

Plant housekeeping conditions including general cleanliness conditions and control of material to prevent fire hazards were observed in areas listed in paragraph 3a. Maintenance of fire barriers, fire barrier penetrations, and verification of posted fire watches in these areas was also observed. No inadequacies were noted.

f. Safety Related Tagouts

During the week of March 11, 1985, the inspector independently verified that the safety related tagouts in effect for the B river water pump and B charging pump were properly prepared and conducted. In each case, the C pump (swing pump) had been correctly realigned to the 1 DF emergency electrical bus to complete the second ESF component train. No deficiencies were noted.

g. Critical Valve Control

The inspectors reviewed the BVPS Operations Department control of critical valves, which if mispositioned could result in damage to vital safety equipment. Designated valves are padlocked in their required position and the keys are controlled by the Nuclear Shift Supervisor. A status log is maintained for each valve which specifies the normal valve position, and documents the quarterly audit. Valves inside containment are verified to be correctly aligned by review of this audit, as all equipment receives a double verification of correct alignment prior to startup after an outage.

The inspector reviewed the valve status log and verified that all critical valves had been independently verified locked and correctly positioned as required by BVPS OM Chapter 48, and that adequate control of the keys to these valves was being maintained. A portion of the critical valve list was verified to be locked in the correct position in the field during a plant tour. Certain valves on this list are also verified each shift on station logs by Nuclear Plant Operators, per BVPS OM Chapter 54. The inspector reviewed selected logs for 1985 to verify that these valves had been properly checked. No problems were observed during this inspection.

4. Engineered Safety Features (ESF) Verification

The operability of various ESF systems was verified by performing a walkdown of accessible portions that included the following as appropriate:

(1) System lineup procedures match plant drawings and the as-built configuration.

(2) Equipment conditions were observed for items which might degrade performance. Hangers and supports are operable.

(3) The interior of breakers, electrical and instrumentation cabinets were inspected for debris, loose material, jumpers, etc.

(4) Instrumentation was properly valved in and functioning; and had current calibration dates.

(5) Valves were verified to be in the proper position with power available. Valve locking mechanisms were checked, where required.

(6) Technical specification required surveillance testing was current.

The following systems were so reviewed:

- River Water System, March 4, 1985.
- Auxiliary Feedwater System, March 6, 1985.
- Emergency Diesel Generators, March 13, 1985.
- Chemical Addition System, March 14, 1985.

During the review of the Chemical Addition System (NaOH), the inspector noted that Technical Specification (TS) 3.6.2.3 LCO requires: (1) 4700 gallons of between 19.5 and 20.0% by weight of NaOH solution, and (2) four chemical injection pumps (QS-P-4A, B, C, and D) capable of adding the solution to the quench spray pump flow. The surveillance requirements verify pump operability on a 31 day frequency by manually running each pump and measuring flow. The TS action statement allows the chemical addition system to be inoperable for up to 72 hours before reactor shutdown is required. This TS does not make a distinction between the two redundant subsystems (ESF trains powered by independent emergency electrical sources), nor does it require the licensee to verify that each pump will start automatically on a test signal at least once per 18 months during shutdown, as other ESF pumps are.

The inspector reviewed the Standard Technical Specification (STS) which referred to the chemical additive tank volume concentration of NaOH and operability of two spray additive eductors, which are passive devices that add the NaOH solution to the quench spray pump suction line by gravity feed. The action in the STS surveillance requirements parallel the BVPS technical specifications with the exception of a five year test of the solution flow rate by gravity feed which is not applicable to a system using chemical injection pumps. No reference is made in the STS to the chemical injection pumps, because this is not a standard design feature, as verified by the inspector through discussions with the residents at plants of a similar design (subatmospheric containments).

NRR safety evaluation of Amendment No. 28 to the BVPS Unit 1 Operating License, dated August 27, 1980, incorporated the current requirements of TS 3.6.2.3 to assure that a metered amount of caustic solution was added to the containment sump for pH control and iodine scrubbing. The evaluation considered the effects of a single failure to assure that at least one spray of pH 11 to 8 would be used at all times during an accident. The current BVPS Technical Specification action statement allows this entire system to be out of service for 72 hours. This does not appear to be consistent with the safety philosophy applied to all other ESF systems with redundant trains, whereby, Technical Specification 3.0.3 allows only one hour for both redundant trains to be out of service.

The BVPS updated FSAR, Section 6.4, states that two chemical injection subsystems are electrically redundant and independent to assure that single failure criteria is adequately addressed. It further states that one chemical injection pump per loop will automatically stop on a signal from the cutback control valve in the quench spray loop provided that the other chemical injection pump is running. The 18 month TS surveillance requirements do not address the testing of this design feature. However, in OST 1.13.11, Quench Spray System Operability Test, DLC does incorporate the auto pump start and cutback tests as a good operating practice.

The inspector brought this to the attention of the Manager of Nuclear Safety. Determination of whether or not a technical specification change is necessary to divide the chemical addition system into respective ESF trains and provide for testing of the chemical injection pumps automatic functions on a refueling frequency is an Unresolved Item (85-06-02).

5. Problem Identification Systems

The inspectors conducted a review of the licensee's Problem Identification Systems to ensure that a management control system was in effect to identify problems and deficiencies in various plant activities, and ensure that such problems were tracked and resolved. Areas covered included; Operations, Quality Control (maintenance and construction), Radiological Controls, and Testing and Plant Performance.

In the Operations area, the inspector reviewed the incident report system by which equipment problems with safety related systems, procedures, and radiological control problems are investigated and reported. The inspector verified that significant events were being evaluated by the Technical Advisory Group (TAG) and that corrective actions recommended as a result of these investigations were being tracked as required. During the first two months of 1985, the volume of incident reports being generated has increased substantially over previous months. This increase in volume could possibly lead to a delay in completion of the incident reports, especially those of greater importance to plant safety. The inspectors will continue to follow the operations incident reporting system to verify that significant problems and corrective actions are prioritized and are resolved in a timely manner. This action will be tracked as Inspector Follow Item (85-06-03).

Problems encountered during the performance of procedures conducted by the Operations Group (OSTs) are reported as comments on the procedure cover sheet or on a separate attached comment sheet. Most of these problems must be resolved to satisfactorily complete the procedure and this may be accomplished by either of several methods: procedure changes, OMCNs for OSTs, or Maintenance Work Requests for equipment problems. Several Problems in this area are discussed in detail in Section 6 of this report.

In the Quality Control area, the inspectors reviewed the licensee's system for reporting deficient conditions. This is accomplished by use of the General Inspection Report (GIR) and the Nonconformance and Corrective Action Report (NCAR) used by station QC personnel and the Nonconformance Report (NCR) used by the station's primary contractor, Schneider Power Corporation.

The inspector reviewed the file of open NCARs and GIRs for 1984 to verify that the system was functioning as intended and that corrective actions were being tracked. Several rejectable GIRs that had been outstanding for up to a year were reviewed to verify that no significant safety problems were being overlooked. No problems were identified.

In the Radiological Control Area, the inspector reviewed the Daily Surveillance Reports to the Rad-Con Supervisor for the past two months and also the radiological problem information memos that report various system leakage problems. These systems appear to be effective in correcting the day-to-day radiological problems that occur in the plant. The inspector toured the plant to verify that the concerns of Rad-Con foreman reported to management were similar to those identified by the inspectors on the daily tours, and that adequate corrective action was being taken on these problems.

The Testing and Plant Performance (T&PP) area was reviewed through a sampling of completed procedures (BVTs) conducted during the last refueling outage by the T&PP section. Test problems are reported during the conduct of testing on a cover sheet appended to the procedure and corrective action summary reported on an attached sheet. Procedure problems identified were logged in a readily identifiable manner and the corrective actions specified were incorporated by procedure changes or recommendations for procedure improvement. Test performance problems were effectively logged and the corrective actions specified were generally comprehensive and complete. No problems were identified in this area.

The inspector also reviewed the Quality Assurance (QA) audits of these activities that were conducted in 1984. Generally, these audits satisfy the basic auditing requirements of each activity in areas such as personnel training, administrative procedure compliance, and corrective action reporting systems. Review of these audits revealed that although they are technically adequate, they do not, in general, address the root causes of identified problems, or the safety significance of these problems. This function is normally accomplished by the Offsite Review Committee (ORC), per BVPS Technical Specification 6.5.2, by virtue of their audits conducted by various subcommittees, e.g., Maintenance and Operations (MOS), and Radiological and Environmental (RES). These ORC subcommittee audits are generally comprehensive and provide an in-depth analysis of the performance of the specific activity, and deal with the safety related responsibilities of these activities. The inspector had no other concerns in the area of problem identification.

6. Surveillance Activities

The inspector conducted a review of Operational Surveillance Test (OSTs) procedures, that were completed during the fourth refueling outage. These OSTs are run every 18 months to verify operability of various systems that cannot be tested during normal operations due to system conditions, conflicts and accessibility of components. The review was performed to verify that the testing accomplished was in compliance with the technical specification or ASME Section XI requirements, the test was accomplished satisfactorily with respect to data recording and procedural signoff, and that the test method appeared adequate to achieve the desired results. The procedures reviewed consisted of 18 OSTs dealing with safety related systems such as containment isolation/depressurization, safety injection, river water, auxiliary feedwater and emergency power systems.

Numerous problems and inconsistencies were identified in the area of test performance. One problem dealt with reverification of prerequisites and initial conditions when procedure accomplishment was conducted over long periods of time, or significant delays were encountered. In certain instances, a second copy of the procedure would be filled out to reverify initial conditions when performing a test of the second train of a given system after a significant delay, but this was not true for all procedures. It was often difficult to verify that the proper initial conditions or prerequisite steps were still in effect when the procedure was completed for the second train. In another case, a portion of a procedure to verify operability of safety injection accumulator isolation valves was accomplished by an entry in the NSS log without a record of verification of initial conditions required by the procedure.

A second problem dealt with logging equipment failures or equipment unavailability due to equipment clearances that were identified during procedure accomplishment. The method of recording these problems and logging final resolution was not always consistent or clear as to how the problem was resolved. Sometimes, these problems were logged on the OST cover sheet with corresponding corrective action specified, but at other times, the problem was noted on a page in the procedure, making it difficult to determine what corrective action was accomplished.

A review of BVPS-1 Station Administrative Procedures and the administrative requirements of the BVPS Operating Manual revealed that there were no specified guidance or requirements for accomplishment of the 18 month operational tests. It appears that such guidance concerning procedure conduct, problem logging and resolution is needed for these tests. Additional licensee action in this area will be tracked as Unresolved Item (85-06-04).

Review of completed Maintenance Surveillance Procedures for instrument calibration and testing, and Beaver Valley Tests of equipment for plant performance, indicated that these tests are performed in a very structured manner. As the problems noted above appear to be limited to only the 18 month frequency OSTs, the inspectors had no further concerns.

7. Modification Activities

The B charging pump (CH-P-1B) has been out of service since plant startup from the fourth refueling outage, to complete modification work under DCP 286, Charging Pump Vibration Supports. This design change had been initiated to address problems encountered with Pacific Centrifugal Charging/Safety Injection Pumps as first identified in Westinghouse Technical Bulletin NSD-TB-78-1, Rev. 1, dated May 1, 1979. Apparently, resonant frequency problems were experienced on the thrust bearing end (drip pocket) of the first generation charging pumps. Weights were added as a temporary fix to dampen the vibration. DCP 286 performed a long term corrective action which included welding ribs as a vibration support on the B and C charging pumps, and removing the dead weights to improve vibration characteristics. This increased the stiffness of the charging pump drip pockets supporting the thrust bearing housing. The 1A charging pump was of a later generation design which did not require the dead weight or vibration modifications. The C charging pump modifications had been accomplished prior to the fourth refueling outage without problems.

While welding the stiffener bars on CH-P-1B, a linear indication was observed by Quality Control inspectors. The initial indication was located on the quarter inch land near the face of the discharge head. Further inspection found two additional indications. The licensee obtained a reworked discharge head from the vendor and installed it during the week of March 4, 1985.

At the close of this inspection period, post-maintenance testing, consisting of a 24 hour pump run, was delayed due to low pressure shaft seal leakage. Discussions with personnel performing the work indicated that this was due to differences in manufacturing tolerances between the existing seal housing components and the new seal package. The licensee has contacted the vendor for guidance.

The licensee's engineering staff informed the inspector that when work is completed on CH-P-1B, a second liquid penetrant examination will be performed on CH-P-1C to ensure that a similar indication had not been missed during the original inspection. The inspectors had no further concerns.

8. Offsite Review Committee

To verify that the Offsite Review Committee functions were conducted in accordance with Technical Specification 6.5.2, the inspectors attended the quarterly meeting on March 6, 1985. The ORC composition, quorum, and meeting frequency met the technical specification requirements. Various subcommittee review reports were submitted to the ORC for review that contained detailed information of their review of the respective assigned areas (such as maintenance and operation, radcon, engineering and audit). From inspector's knowledge of events occurring in the past quarter, it was verified that reportable events, significant operating abnormalities or deviations from normal expected performance of plant equipment that affect nuclear safety, and recognized indications of unanticipated deficiencies in some aspect of operation of safety-related structure systems or components were discussed. The inspectors identified no concerns.

9. 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 corrective action. 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:

-- LER: 85-01* Startup Prior to Establishing Containment Integrity.

-- LER: 85-02** Reactor Coolant System Leakage.

-- LER: 85-03** Inadvertent Reactor Trip and Safety Injection.

-- LER: 85-04 Auxiliary Feedwater Pump Spurious Auto-Start.

-- LER: 85-05 Failure to calibrate PORV Isolation Valve Limit Switch.

*This item was discussed in special NRC Inspection Report No. 50-334/85-03.

**These items are discussed in Inspection Report 50-334/85-02.

LER: 85-04 identified two instances where the B motor driven auxiliary feedwater pump auto-started without an apparent actuation signal. At the time of the incident, two maintenance surveillance procedures were in progress involving Bus 1 DF undervoltage protection testing and plant process signal sensor performance monitoring, which had been performed without any previous similar event. From a review of the six pairs of contacts in the feedwater pump control circuitry (benchboard control switch, emergency shutdown panel control switch, relays 62-VF-116, K611, K634, and 3-AFPB), the licensee was unable to identify the cause for the auto-start. Neither the benchboard nor the emergency shutdown panel control switches were actuated. Since Relay K611 contacts are closed it was determined that this was not the source. Likewise, Relay K634 contacts are closed by any two or three level channels in any two steam generators indicating a low-low level. Since this condition did not occur, misoperation of this relay is not expected. The contacts on two other relays, 62-VF-116 and 3-AFPB, close on either a trip of all main feedwater pumps or a failure of the turbine driven auxiliary feedwater pump to start. Again neither of these conditions occurred and the station concluded that the auto-start signals were spurious and self-clearing. This item has been entered into the licensee's tracking system should any similar events occur in the future.

LER: 85-05 concerns Maintenance Surveillance Procedure MSP 6.67, that was prepared in June, 1982, and was never entered into the Maintenance Planning System for accomplishment. During this period of time, DLC was in the process of assuming responsibility of maintenance scheduling which at the time was accomplished by a contractor. It appears that during this transition MSP 6.67 failed to become included in the Maintenance Planning System. Since that time, procedures written by the station procedures section for maintenance activities are distributed to the planning and scheduling section for inclusion in the appropriate schedule. In addition to this, the planning and scheduling section has been assigned to conduct a semi-annual review of the MSP index against the Maintenance Planning System to ensure that all existing procedures are scheduled. The inspectors will track this actions as Inspector Follow Item (85-06-05) to verify that the subject reviews are completed.

10. Maintenance Program

a. Review

The inspector reviewed the administrative program established for corrective and preventive maintenance. The inspector reviewed Station Administrative Procedures, Chapter 8, Maintenance, Revision 8, and Chapter 30, Maintenance Work Request, Revision 1, which establish the maintenance program and describe the processing of Maintenance Work Requests (MWRs) for corrective maintenance.

The inspector reviewed the maintenance organization and its operation with the Maintenance Supervisor, who stated that the organization is structured into three groups, electrical, mechanical, and support. He also stated that the organization had 19 electricians, 34 mechanics, 4 welders, and 3 machinists plus the supervision, engineering, and management needed to support these workers. The Supervisor also noted that the maintenance organization had experienced a relatively high turnover in the worker ranks during the fall of 1984 due to a company worker reassignment, or "bump". The bump had occurred due to the decommissioning of Shippingport Atomic Power Station (SAPS) and the early retirement program offered by the company, and had involved the realignment of union personnel based on their trade level and seniority.

The inspector reviewed ten completed MWRs to verify that administrative requirements for corrective maintenance of safety related equipment were being met. The inspector also reviewed the corrective maintenance procedures which specified the work on the above MWRs. The inspector concluded that the procedures were thorough and properly written and that they contained numerous hold points for quality control inspections.

The inspector observed maintenance work in progress under MWR 842312 for River Water Pump 1B repair, MWR 842598 for Reactor Plant Component Cooling Water Pump 1A overhaul, and MWR 850600 for 4160 Volt Breaker AE4 repair to verify that the work had been properly reviewed and approved, the equipment had been tagged out of service properly, and the worker was qualified to perform the given task.

The inspector reviewed the interface between quality control (QC) and maintenance with the Quality Control Supervisor. He stated that QC inspectors have few problems in being notified of the maintenance work and that occasions when hold points are being bypassed are rare. The QC inspectors note unacceptable work in their General Inspection Reports (GIRs) as "rejectables", and then the hold points are not released until the problems are corrected. The rate of rejectables in GIRs during 1984 was 7% and fairly consistent between outage and non-outage. The supervisor stated that he has not observed any decrease in the quality of maintenance work due to the turnover of the bump and attributed this to the high skill level of newer employees and the nuclear experience at SAPS that many workers had.

The inspector reviewed the Outgoing Engineering Memorandum Log to assess the communications between maintenance and engineering personnel. The inspector found that in the first three months of 1985, 116 memos were written by maintenance and that responses by engineering were timely, often in a few days to support urgent maintenance needs.

The inspector reviewed the qualification program for welders and welding procedures, including Welding Manual Procedures 1.1, MWRs Requiring Welding, and 1.2, Qualification of Welding Procedures and Welders, and the documentation to support the qualifications.

The inspector reviewed the control of measuring and test equipment used by electricians and mechanics, including the equipment storage areas. Also, the inspector toured the shop areas.

The inspector reviewed the master schedule for preventive maintenance, selected preventive maintenance procedures, and status reports of preventive maintenance work completion.

The inspector reviewed the computerized equipment history files and the files of completed MWRs organized by system.

The inspector reviewed the on-the-job (OJT) training program recently instituted, including Maintenance Manual Section U, Maintenance On-The-Job Training Program, and records of completed training.

b. Findings

The inspector found the licensee's program for preventive and corrective maintenance to be acceptably performing its assigned functions subject to the following concerns:

1. The licensee's February 1985 Maintenance Trend Monitoring Report shows that the trend of backlogged MWRs in the mechanical group have increased by over 50% over the last nine months. Also, it shows that backlogged preventive maintenance procedures (PMPs) in the mechanical group have increased from 3% to 20% over the last six months. Further, these levels of backlogged work exceed targeted goals. Although both the refueling outage in late 1984 and the company-wide laborer bump in 1984 could have effected the mechanical groups's work performance, the inspector noted that the electrical group also experienced these effects and that their backlogged MWRs and PMPs had remained relatively stable and within targeted goals. In a March 14 discussion with the inspector, the station superintendent stated that licensee management was aware of the adverse trend of backlogged work in the mechanical group and that specific management action would be taken in the near future if the trend continues. The inspector stated that although the current levels

of backlogged work were not unacceptable, the continuance of the increasing trend could adversely affect the licensee's maintenance program.

This item (85-06-06) is unresolved pending licensee action to reduce backlogged work in the mechanical maintenance area.

2. The inspector found MWR 830709 for valve HCV-MS-104 on the Residual Heat Removal System, on which work had been completed on August 14, 1983, but the final review of the MWR paperwork was still in progress. Also, the MWR Tracking Report of March 12, 1985, showed the mechanical group has 244 MWRs listed as Complete Awaiting Paper (CAP), i.e., work completed but review in progress. Based on the above examples, the inspector concluded that some MWR paperwork reviews are taking an undesirably long time. Although no regulatory requirements cover the time period of this review, such long times before MWR data is entered into equipment histories could hinder repetitive problem identification and corrective action. The inspector noted that no items in the Monthly Maintnenace Trend Monitoring Report addressed this area.

   This inspector followup item (85-06-07) is open pending licensee action to achieve timely reviews of completed MWRs.

11. Exit Interview

Meetings were held with senior facility management periodically during the course of this inspection to discuss the inspection scope and findings. A summary of inspection findings were further discussed with the licensee at the conclusion of the report period.