U. S. NUCLEAR REGULATORY COMMISSION

REGION I

License Nos.	DPR-66, NPF-73
Report Nos.	50-334/99-08, 50-412/99-08
Docket Nos.	50-334, 50-412
Licensee:	Duquesne Light Company Post Office Box 4 Shippingport, PA 15077
Facility:	Beaver Valley Power Station, Units 1 and 2
Inspection Period:	September 5, 1999 through October 16, 1999
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EXECUTIVE SUMMARY

Beaver Valley Power Station, Units 1 & 2
NRC Inspection Report 50-334/99-08 & 50-412/99-08

This inspection included aspects of licensee operations, engineering, and maintenance. The report covers a 6-week period of resident inspection.

Operations

- On September 6, control room operators promptly responded to failed main unit generator indications and placed the plant in a safe shutdown condition. The Operations Manager made a good decision to perform additional generator troubleshooting with the reactor in a shutdown condition. The reactor startup and generator synchronization procedures were briefed in detail and properly controlled. Control room communications, and management and Quality Assurance oversight were good. (Section O1.2)

- The Independent Safety Evaluation Group (ISEG) was fulfilling its charter as specified in the Updated Final Safety Analysis Report. Procedures provided appropriate ISEG program implementation guidance. The monthly ISEG reports, self-assessment, root cause evaluation and independent review were generally performed well. Two exceptions were the corrective action program self assessment which was too limited in scope to improve plant safety and the loss of main generator seal oil pressure causal assessment which did not determine why planned maintenance was deferred. (Section O7.1)

- Corrective actions to a technical specification violation included a reduction in the number of outstanding operations manual change notices from 670 to 30. (Section M8.3)

- On September 12, operators promptly established a reliable 4kV bus electrical lineup after identifying a failure of one of the onsite 4kV supply breakers. Good observation by a plant operator prevented a similar failure of the off-site 4kV supply breaker. (Section E2.3)

Maintenance

- Four maintenance work activities were conducted safely with appropriate management oversight. (Section M1.1)

- Seven surveillance tests were completed in accordance with procedures. However, a plant operator did not recognize increased steam and water leakage as degraded conditions during the Unit 1 steam driven auxiliary feedwater pump surveillance test. (Section M1.2)

- Electricians, engineers, and vendor representatives communicated effectively and safely performed comprehensive troubleshooting to investigate the failed Unit 1 main unit

generator voltage regulator. Although the cause was not conclusively identified, the investigation and corrective actions were reasonable to preclude recurrence of the event. (Section M2.1)

- Station personnel identified seven additional missed technical specification (TS) surveillances since February 1999. Three of the seven reflected current performance deficiencies and were caused by human error. The remaining four were old issues, due primarily to longstanding procedure deficiencies. While the safety significance of the individual missed tests was low, the continued examples of missed surveillance tests indicate that previous corrective actions have not been fully effective at ensuring TS surveillance tests are performed as required. (Sections M8.1, M8.2, M8.3, E8.1)

- Station personnel demonstrated initiative by using industry experience and lessons learned from a previous NRC violation to identify four missed TS surveillance tests. The events were of minimal safety significance. (Sections M8.1, M8.2, M8.3, E8.1)

Engineering

- Temporary modifications were appropriately controlled and scheduled for removal in accordance with the priority of the specific item. (Section E2.1)

- Licensee amendment requests, including requests to revise nonconservative technical specifications, were being completed in a timely manner. (Section E2.2)

- System engineers effectively identified the cause of a failed 4kV bus supply breaker. Engineers and electrical technicians coordinated closely to determine the extent of condition and perform appropriate repairs to all affected 4kV breakers. (Section E2.3)

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Report Details

Summary of Plant Status

Unit 1 began this inspection period at 100 percent power. On September 6, operators manually tripped the reactor in response to a main unit generator voltage regulator failure (Section O1.2). Continued voltage regulator problems were observed following restart on September 9, and the unit was shut down to continue evaluation and repairs. The unit was restarted and synchronized to the offsite power grid on September 11, following successful voltage regulator repairs. The unit operated at or near full power through the end of the inspection period, except for brief power reductions to support main condenser waterbox isolation and cleaning.

Unit 2 began this inspection period at 100 percent power. The unit remained at or near full power except for brief power reductions to support main condenser waterbox isolation and cleaning.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

O1.2 Unit 1 Manual Reactor Trip Due to Main Unit Generator Voltage Regulator Oscillations

a. Inspection Scope (71707, 93702)

Unit 1 experienced oscillations of the main unit generator (MUG) voltage regulator (VR) circuitry which resulted in the plant operators tripping the reactor in order to minimize any degradation to the plant's electrical generating equipment. The inspectors responded to the control room and monitored plant stabilization to determine whether operators maintained plant safety. The inspectors observed plant restart and synchronization to assess corrective action effectiveness.

b. Observations and Findings

On September 6 at 5:22 p.m., oscillations of the MUG VR circuitry were observed by the control room operators. The MUG exciter field current, voltage, and power factor meters were oscillating from their normal steady-state full power values. In addition, control room annunciators associated with the MUG VR alarmed. Operators validated the indications for a short period of time (18 seconds), then tripped the reactor. All safety equipment performed as required. Operators properly stabilized the plant using their post-trip emergency operating procedures. Minor equipment concerns were identified and corrected prior to plant restart. The control room operators responded promptly to

the degraded MUG indications and placed the plant in a safe condition. Operators properly reported the event to the NRC as required by 10 CFR 50.72.

Voltage regulator troubleshooting activities are discussed in section M2.1. Following replacement of a failed VR error detection circuit comparator card, the plant restarted on September 9. When the VR was placed back into service (automatic mode) after the MUG was synchronized to the offsite distribution system, the VR oscillations returned. The VR was quickly (4 seconds) returned to manual mode of control which stabilized the VR. The Operations Manager decided that continued troubleshooting would be done with the plant shut down and later that day the MUG was disconnected from the offsite distribution system and the reactor shut down to Mode 3 (Hot Standby). The inspectors concluded that VR troubleshooting that was performed was reasonable for the original problem and that additional troubleshooting was safer with the reactor in a shutdown condition.

Following additional MUG VR troubleshooting, the plant again returned to power operation on September 11. The inspectors observed the MUG synchronization to the offsite distribution system. The MUG VR responded normally. On both plant startups, the control room operators were briefed in detail by plant management who reviewed the procedure steps and reinforced expectations for operator response. The MUG synchronization was then performed in a controlled manner. Communication in the control room was good. The inspectors noted good oversight by plant management and Quality Assurance. Quality Assurance inspectors observed operator actions and noted minor procedure discrepancies. The inspectors also noted several additional minor discrepancies in MUG synchronization procedure, 1OM-52.4.A, "Increasing Power from 5% Reactor Power and Turbine on Turning Gear to Full Load Operation," Rev. 30. The inspectors discussed these with the Operations Manager and Quality Assurance inspector who initiated Condition Report (CR) 992350.

c. Conclusions

On September 6, control room operators promptly responded to failed MUG indications and placed the plant in a safe shutdown condition. The Operations Manager made a good decision to perform additional generator troubleshooting with the reactor in a shutdown condition. The reactor startup and generator synchronization procedures were briefed in detail and properly controlled. Control room communications, and management and Quality Assurance oversight were good.

O7 Quality Assurance in Operations

O7.1 Independent Safety Evaluation Group

a. Inspection Scope (71707)

The inspectors reviewed performance of the Independent Safety Evaluation Group (ISEG) in order to assess their function for providing recommendations to improve plant safety. The inspectors reviewed the following ISEG documents: 1) ISEG charter

contained in the Updated Final Safety Analysis Report (UFSAR); 2) monthly reports; 3) a self assessment report; 4) a root cause evaluation; and 5) a Generic Letter review.

b. Observations and Findings

The ISEG is composed of three individuals who evaluate onsite unit operating characteristics, activities, and external nuclear operating experience. Based on these evaluations, the ISEG is responsible to provide recommendations for improved plant safety. The inspectors reviewed the charter for ISEG, which is described in the Unit 2 UFSAR and the controlling procedures which are located in the Safety and Licensing Administrative Manual (SLAM). Safety and Licensing Administrative Manual Volume IV, Chapter 2, "ISEG Evaluation Administrative," Rev. 7, accurately reflected the ISEG information in the UFSAR. Other SLAM ISEG procedures, which provided guidance for specific ISEG tasks, were also reviewed.

The inspectors reviewed the monthly ISEG reports for April through August, 1999. The reports were well written and summarized the ISEG recommendations appropriately. Self-assessment BV-SA-99-21 on the Condition Report Program, which reviewed the corrective action program compliance to the requirements of Nuclear Power Department Administrative Procedure 5.6, "Processing of Condition Reports," Rev. 5 was reviewed. It identified programmatic weaknesses and provided recommendations for administrative improvements. However, the defined scope of the self-assessment was limited to procedure compliance and did not significantly add improvement to plant safety.

The inspectors reviewed the root cause evaluation for the April 30, 1999, loss of MUG seal oil pressure. An earlier water intrusion into the seal oil system had led to a buildup of corrosion products which obstructed the seal oil system filter flow. The evaluation adequately characterized the root cause and accurately described the event precursors. The recommended corrective actions were complete. However, the evaluation did not explain one aspect of one of the causal factors, which was the decision to defer planned corrective maintenance to clean the seal oil during the surveillance outage. The inspectors determined that this evaluation deficiency limited the evaluation's contribution toward plant safety.

ISEG performed an independent review of the Generic Letter 89-13, "Service Water Systems Affecting Safety Related Equipment," commitments. The review found no unfulfilled commitments and identified several good programmatic improvements which were placed in the corrective action program for implementation.

c. Conclusion

The Independent Safety Evaluation Group (ISEG) was fulfilling its charter as specified in the Updated Final Safety Analysis Report. Procedures provided appropriate ISEG program implementation guidance. The monthly ISEG reports, self-assessment, root cause evaluation and independent review were generally performed well. Two exceptions were the corrective action program self assessment which was too limited in

scope to improve plant safety and the loss of main generator seal oil pressure causal assessment which did not determine why planned maintenance was deferred.

O8 Miscellaneous Operations Issues (92700)

O8.1 (Closed) Licensee Event Report (LER) 50-334/99-10: Unit 1 Manual Reactor Trip Due to Main Unit Generator Voltage Regulator Malfunction

This event is documented in Sections O1.2 and M2.1 of this report. The LER accurately described the event. Although a definitive root cause for the voltage regulator malfunction could not be identified, the troubleshooting efforts were comprehensive and the corrective actions appropriate.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Routine Maintenance Observations

a. Inspection Scope (62707)

The inspectors observed selected maintenance activities on important systems and components. The maintenance work order (WO) activities observed and reviewed are listed below.

- WO 99-217479-000 Incoming 4 (kilovolt) kV Supply Unit Station Service Transformer Air Circuit Breaker (ACB) repair
- WO 99-217654-000 Turbine Electro-hydraulic Control (EHC) Direct Current (DC) Control Power troubleshooting
- WO 99-217654-002 Turbine EHC DC Control Power troubleshooting
- WO 99-210237-000 Motor Driven Auxiliary Feedwater Pump preventive maintenance

b. Observations and Findings

The activities observed and reviewed were performed safely and in accordance with proper procedures. Management oversight during the risk significant troubleshooting on the EHC power supply was appropriate.

c. Conclusions

Four maintenance work activities were conducted safely with appropriate management oversight.

M1.2 Routine Surveillance Observations

a. Inspection Scope (61726)

The inspectors observed selected surveillance tests. Operational surveillance tests (OSTs), maintenance surveillance procedures (MSPs), and temporary operating procedures (TOPs) reviewed and observed by the inspectors are listed below.

- 1OST-24.2 — Motor Driven Auxiliary Feed Pump Test [1FW-P-3A], Rev. 16
- 1OST-24.4 — Steam Turbine Driven Auxiliary Feedwater (AFW) Pump Test [1FW-P-2], Rev. 13
- 1/2OST-30.19 — Intake Structure Silt Check/Cleaning, Rev. 7
- 2OST-36.2 — EDG 2-2 Surveillance Test, Rev. 24
- 2OST-30.1A — Standby Service Water Pump [2SWE-P21A] Test, Rev. 12
- 2MSP-11.10-I — 2SIS-P923, Safety Injection Accumulator (2SIS-TK21A) Pressure Channel II Test, Rev. 4
- 2TOP-99-12 — Turbine-Driven Auxiliary Feedwater Pump Steam Header Supply Isolation Valve(s) Stroke Test, Rev. 0 and 1

b. Observations and Findings

The surveillance testing was performed safely and in accordance with proper procedures. During performance of 2TOP-99-12, operators appropriately stopped the test when indications were different than expected. Corrective maintenance and procedure changes were completed before the procedure was re-started. On the Unit 1 steam driven AFW pump test, the inspectors noted steam and water leaks on the AFW turbine and pump. The inspectors questioned the plant operator (PO) performing the test and reviewed the test procedure. The PO indicated that, since he had not performed the quarterly surveillance recently, he did not know whether the current steam and water leakage was considered normal. However, the PO had already completed a procedural step in the surveillance test which verified that the AFW turbine exhibited normal steam and water leakage after startup. The PO contacted maintenance personnel who reviewed the AFW leakage and indicated that the leakage was not normal, and the condition should be included in the corrective maintenance backlog. Maintenance personnel initiated work requests for both the steam and water leaks when they were unable to identify any outstanding requests in the backlog. The inspectors discussed the issue with the Nuclear Shift Supervisor who initiated CR 992707 to provide better guidance to the PO's in order to identify degraded conditions during infrequently performed surveillance testing.

c. Conclusions

Seven surveillance tests were completed in accordance with procedures. However, a plant operator did not recognize increased steam and water leakage as degraded conditions during the Unit 1 steam driven auxiliary feedwater pump surveillance test.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Unit 1 Main Unit Generator Voltage Regulator Troubleshooting and Repair

a. Inspection Scope (37551, 62707)

The inspectors monitored MUG VR troubleshooting activities to determine whether maintenance activities were performed safely and were appropriate to preclude a repeat failure. The inspectors conducted interviews, reviewed work orders, and observed troubleshooting activities.

b. Observations and Findings

On September 6, 1999, the Unit 1 MUG operating parameters began to oscillate outside of their normal operating bands, indicating a likely MUG VR failure (see Section O1.2). Preliminary evaluation of technical drawings revealed five potential circuit faults which could cause the observed VR oscillations. Technicians performed several troubleshooting plans as well as the entire once-per-cycle preventive maintenance inspection, 1/2PMP-35-EXC-Regulator-1E, "WTA Voltage Regulator Inspection and Testing," Rev. 9. Extensive testing identified no problems with the permanent magnetic generator, the main generator, the main generator exciter, or the exciter direct current circuit. Engineers determined that an oxidation/corrosion layer found on a fine compensation potentiometer on a comparator card within the error detection circuit was the most probable cause of the event. A vendor-recommended equipment upgrade to preclude the potential for corrosion on this component had been deferred from past outages due to low priority. The inspectors determined that the VR failure causal analysis was technically sound, and the level of troubleshooting was reasonable for the observed VR oscillations.

The failed error detection circuit card was replaced, and the main generator was synchronized to the grid on September 9. When the VR was placed in automatic, operators immediately observed oscillations similar to those that occurred on September 6. Operators promptly returned the VR to manual control which stabilized the oscillations. Additional on-line and off-line troubleshooting identified further error detection circuit anomalies, but not a definitive cause. Technicians replaced the entire VR logic drawer and, based on a vendor recommendation, installed a capacitor as a temporary modification to the logic drawer. The modification proved effective at stabilizing the error detection circuit output as demonstrated following the September 11, unit restart. Additional corrective actions identified in LER 50-334/99-10, including scheduling of associated vendor recommended VR upgrades and independent diagnostic evaluation of the replaced VR logic drawer, were appropriate. The inspectors determined that electricians, engineers, and vendor representatives communicated effectively and safely performed comprehensive troubleshooting to investigate the failed MUG VR. Although the cause was not conclusively identified, the investigation and corrective actions were reasonable to preclude recurrence of the event.

c. Conclusions

Electricians, engineers, and vendor representatives communicated effectively and safely performed comprehensive troubleshooting to investigate the failed Unit 1 main unit generator voltage regulator. Although the cause was not conclusively identified, the investigation and corrective actions were reasonable to minimize the probability of recurrence of the event.

M8 Miscellaneous Maintenance Issues (92700)

M8.1 (Closed) Licensee Event Report 50-412/99-08: Failure to Comply with Technical Specifications Due to Not Meeting SR 4.8.1.1.2.f, Simultaneous Start Test of Emergency Diesel Generators

a. Inspection Scope

The inspectors performed an onsite review of the LER.

b. Observations and Findings

On July 23, the emergency diesel generator system engineer identified, during an industry operating experience review, that a Unit 2 technical specification (TS) surveillance test was not fully performed in 1996. Technical Specification 4.8.1.1.2.f required demonstration of diesel generator independence by starting both diesel generators simultaneously from a standby condition and verifying that each diesel generator achieves voltage and frequency within the specified ranges in less than/equal to 10 seconds. The surveillance test is required every 10 years. In 1996, the testing was deficient in that the voltage was not verified to be within the specified range in less than/equal to 10 seconds. The voltage was verified with the specified range, but not verified within the 10 second time period. Additionally, a licensing engineer identified that the original test in 1987 also was inadequate. The licensee concluded the root cause was human error in identifying the surveillance requirement and translating the requirement into the surveillance procedure. On July 23, the surveillance test was revised and satisfactorily performed. The inspectors reviewed the revised surveillance test procedure, observed the successful retest, and determined that corrective actions were appropriate. The inspectors noted that station personnel failed to identify the deficiency during the 1998 TS surveillance procedure review. The licensee subsequently initiated a significant category two CR (992774) to determine whether this and other recently identified missed surveillances represent a larger problem.

Failure to verify emergency diesel generator voltage within the time requirement was a violation of TS 4.8.1.1.2.f. This failure constitutes a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

System engineers identified, through use of industry operating experience, that a 10 year emergency diesel generator surveillance test did not completely satisfy technical specification requirements. Corrective actions were appropriate and the testing was completed satisfactorily.

M8.2 (Closed) Licensee Event Report 50-334(412)/99-05: Inadequate Meteorological Wind Speed Instrumentation Calibration Range Led to Failure to Comply with Technical Specifications

An instrumentation and control supervisor identified that wind speed instrumentation was calibrated for only half of the range specified in the UFSAR (e.g., 0-25 vs. 0-50 miles per hour (mph)). Although the instruments had been accurately calibrated over the 0-25 mph range, their accuracy could not be assured over their full required range of performance. Operators declared all six wind speed instruments inoperable and determined that, due to the inadequate calibration procedure, numerous gaseous waste discharges were performed in the past without the required minimum number operable wind speed instruments. Subsequent sensor calibration after this event, determined that the as-found settings were satisfactory over the 0-50 mph range. The wind speed instruments are used for monitoring purposes and do not provide any automatic function. Not having previously known the instruments were inoperable, the station did not submit a special report to the NRC. The gaseous waste releases performed without operable monitoring instrumentation and failure to submit a special report to the NRC were violations of TS 3.3.3.4. This failure constitutes a violation of minor significance and is not subject to formal enforcement action. The inspectors performed an onsite review of this LER and determined that maintenance personnel demonstrated good initiative to identify this calibration discrepancy. Lessons learned from a recent NRC violation for missed TS surveillances were properly applied. The inspectors determined that the LER accurately documented the event and verified appropriate corrective actions were completed in a timely manner.

M8.3 (Closed) Licensee Event Report 50-334/99-09: Missed Surveillance of Component Cooling Water System 10" to 8" Header Cross-Connect Inlet Isolation Valve 1CCR-42

a. Inspection Scope

The inspectors performed an onsite review of the LER and an assessment of the root cause and corrective actions.

b. Observations and Findings

On July 22, the Unit 1 Nuclear Shift Supervisor identified that the verification of the correct position for component cooling water valve, 1CCR-42 (the header cross connect inlet isolation valve to the spent fuel pool heat exchangers), had not been completed during the performance of the operating surveillance test earlier that day. Operators are required to verify the valve's position monthly per TS 4.7.3.1.b. The surveillance was

completed satisfactorily on July 23. Operators performed an extent of condition review and identified that on April 29, operators did not verify the position of 1CCR-42 during performance of the surveillance procedure. The cause of the event was attributed to insufficient attention by the licensed operators who performed and reviewed the surveillance test. A contributing cause was poor procedure quality due to handwritten changes on the surveillance procedure. The changes rendered the valve verification difficult to distinguish from other valves that were deleted.

Technical Specification 4.7.3.1.b requires that each component cooling valve servicing safety-related equipment be verified in its correct position monthly. Contrary to TS 4.7.3.1.b, on April 1 to May 27, 1CCR-42 was not verified in its correct position. This failure constitutes a violation of minor significance and is not subject to formal enforcement. The valve was verified in the correct position on May 27, and redundant indications confirmed that the valve was in the correct position from April 1 to May 27.

The inspectors determined that the root cause evaluation was conducted effectively. The corrective actions addressed the immediate issues and were appropriate to prevent recurrence. In addition, senior management directed actions to reduce the operation manual change notices (OMCNs), which are handwritten procedure changes. Since July 28, the OMCN backlog has dropped from 670 to 30.

NRC Inspection Report Nos. 50-334(412)/99-04 previously documented three violations of TS setpoint or calibration surveillance requirements. During this inspection period, the inspectors noted that station personnel have identified seven additional missed TS surveillances since February 1999. Two missed surveillances, associated with the Unit 1 axial flux difference monitor alarm and mis-calibration of a power range nuclear instrument, occurred during this inspection period; these events will be closed out concurrent with the associated LER reviews. Three of the seven reflected current performance deficiencies as they were caused by human error. The remaining four were old issues, due primarily to longstanding procedure deficiencies. While the safety significance of the individual missed tests was low, the continued examples of missed surveillance tests indicate that previous corrective actions have not been fully effective at ensuring TS surveillance tests are performed as required. As documented in Section M8.1, the licensee initiated corrective action to collectively review this concern.

c. Conclusion

Station personnel identified seven additional missed TS surveillances since February 1999. Three of the seven reflected current performance deficiencies and were caused by human error. The remaining four were old issues, due primarily to longstanding procedure deficiencies. While the safety significance of the individual missed tests was low, the continued examples of missed surveillance tests indicate that previous corrective actions have not been fully effective at ensuring TS surveillance tests are performed as required.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Temporary Modifications

a. Inspection Scope (37551)

The inspectors reviewed the current list of temporary modifications (TMs) for overall impact on safe operations and the quality of engineering evaluations for the modifications. In addition, the inspectors verified that the TMs were scheduled to be removed in a timely manner and evaluated properly during engineering quarterly reviews.

b. Observations and Findings

On September 9, Units 1 and 2 had 12 and 11 active TMs, respectively. The overall impact of the TMs was evaluated as minor with many of modifications affecting low safety significant equipment. Twelve of the twenty-three TMs were scheduled with work orders assigned for the next refueling outage. The remaining TMs were scheduled to be completed within the next 18 months. The scheduling and completion of the TMs were commensurate with the priority of the items. The quarterly reviews conducted by nuclear engineers and system engineers were appropriate and completed per procedural guidance. The inspectors reviewed a sample of the 10 CFR 50.59 safety evaluations and concluded that the evaluations were adequate to support the TMs.

c. Conclusions

Temporary modifications were appropriately controlled and scheduled for removal in accordance with the priority of the specific item.

E2.2 License Amendment Requests Backlog

a. Inspection Scope (37551, 71707)

The inspectors reviewed the license amendment requests (LARs) backlog to identify potentially safety significant items and to examine any compensatory measures taken for the items. In addition, the inspectors reviewed the prioritization process for the LARs. This inspection was conducted in response to previous inspection findings where nonconservative TSs were identified but TS amendment requests were not submitted in a timely manner (see NRC Integrated Inspection Reports 50-334(412)/98-01, 50-334(412)/98-04, and 50-334(412)/98-05).

b. Observations and Findings

The LAR backlog was divided in four groups: 1) LARs submitted to the NRC; 2) LARs on hold awaiting technical input from another department; 3) LARs in progress through

the internal review process; and 4) LARs to be incorporated in the improved standard TS upgrade. As of October 11, 14 LARs were submitted to the NRC, 10 LARs were on hold, 4 LARs were in progress, and 15 LARs were associated with the improved standard TS upgrade. The nonconservative TSs identified in 1998 were properly prioritized and have been submitted to the NRC. The additional items reviewed were comprised mainly of enhancements/improvements to the TSs. The methods for tracking and prioritization were not clearly delineated in the governing procedures; however, the licensing staff was cognizant of the outstanding LARs. A February 1999 meeting between operations management, nuclear engineering management, and safety and licensing personnel helped to provide guidance for prioritization. The inspectors' review of the outstanding LARs did not identify any issues with immediate safety significance or that required additional compensatory measures beyond those described previously for nonconservative TSs.

c. Conclusions

Licensee amendment requests, including requests to revise nonconservative technical specifications, were being properly prioritized and completed in a timely manner.

E2.3 Unit 1 4kV Onsite and Offsite Power Supply Breaker Repair

a. Inspection Scope (37551)

On September 12, after transferring the 4kV power supply from the offsite supply to the on-site supply, the operating crew identified a failed 4kV onsite supply breaker. The inspectors verified that the electrical power supply configuration provided for safe plant operation and observed the troubleshooting and repair of the 4kV supply breakers.

b. Observations and Findings

The onsite 4kV supply breaker (ACB-341D) to the "D" 4kV electrical bus was found to have lost 125 volt direct current (VDC) control power. A strong burnt odor was also noticed near the breaker cubicle. Because the 125 VDC control power was lost, the onsite breaker would not have actuated the automatic transfer to offsite supply power in response to a unit trip. This condition degraded one of the two offsite power supplies required by TS. The Nuclear Shift Supervisor (NSS) declared the offsite power supply inoperable and appropriately entered TS action statement 3.8.1.1 which required verification of the remaining offsite supply and restoration of the degraded offsite supply within 72 hours. Operators transferred the "D" 4kV bus supply to the offsite supply. After the offsite breaker ACB-341B closed, the charging spring motor failed to stop running. The operator manually stopped the charging spring motor. The NSS declared the offsite supply operable but degraded (the offsite supply breaker was capable of one open/close/open cycle in its configuration with the charging springs charged) and exited the TS action statement. The inspectors validated the NSS's operability determination after discussing the breaker configuration with the system engineer. The issue was captured in CR 992335.

Although these breakers are not safety related, they perform an important function to provide electrical power to the station. Loss of offsite power contributes approximately 4 percent to the overall plant core damage probability.

The system engineer identified the loss of 125 VDC control power to ACB-341D as a result of the charging spring motor failing to stop after the breaker closed. Good observation by the plant operator prevented a similar occurrence on ACB-341B. Further investigation by the system engineer, with support of the electrical maintenance department, identified that the root cause of the charging spring motor failure was physical interference between the motor control center (MCC) back panel and an actuating arm located on the breaker. The 4kV breakers were recently refurbished (March 1999) by the vendor and an upgraded actuating arm was installed. The position of the arm was such that it contacted the back of the MCC cubicle and did not complete its required movement. Score marks were identified on the back panel of the MCC cubicle.

Initial review of breaker maintenance records identified two additional 4kV onsite power supply breakers as having been refurbished and therefore potentially degraded. On September 14, operators transferred the remaining 4kV busses from onsite to offsite supply, while engineering and maintenance personnel developed a repair plan. The repair plan was very basic and it involved removal of 1/8" of material from the end of the actuating arm to provide adequate clearance to the MCC back panel. By September 16, the four onsite supply breakers and two offsite breakers were inspected, repaired, and post maintenance tested satisfactorily. The two remaining offsite supply breakers, which remained closed, were integrated into the work week schedule and repaired during the week ending October 1.

The inspectors observed the breaker maintenance and noted good coordination between system engineers and electrical maintenance technicians. Plant operators and electrical technicians were cognizant of their work activities. The system engineer effectively worked with the vendor to develop the repair plan. The Nuclear Engineering Department provided an engineering memorandum authorizing the changes to the breaker actuator arm. The system engineer submitted an industry operating experience report alerting other sites to the potential problem.

c. Conclusion

On September 12, operators promptly established a reliable 4kV bus electrical lineup after identifying a failure of one of the onsite 4kV supply breakers. Good observation by a plant operator prevented a similar failure of the off-site 4kV supply breaker. System engineers effectively identified the cause of the failed 4kV bus supply breaker. Engineers and electrical technicians coordinated closely to determine the extent of condition and perform appropriate repairs to affected 4kV breakers.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) Licensee Event Report 50-334/99-08: Missed Inservice Testing Program Surveillance Attribute.

a. Inspection Scope (92700)

The inspectors performed an onsite review of this LER. The inspectors interviewed the Unit 1 Inservice Testing (IST) Program engineer to evaluate the corrective actions.

b. Observations and Findings

On April 23, 1999, the Unit 1 IST Program engineer identified that two suction valves used to supply the high head safety injection pumps from the refueling water storage tank (RWST) were only stroked time tested in the open direction. These valves, motor operated valve (MOV)-1CH-115B and MOV-1CH-115D, have safety functions to open (upon receipt of a safety injection (SI) signal) and close (after low level is reached in the RWST). The stroke time testing requirement for the valves to close was not included in the original IST program in 1976 and had not been performed since original plant operation. The plant was in Mode 5 (cold shutdown) when this condition was discovered and the valves were declared inoperable. Condition Report 991036 was initiated to incorporate the problem into the site's corrective action program.
The corrective actions for this event were comprehensive. The valves were stroke time tested satisfactorily in the closed direction on the following day. The IST program and surveillance procedure used for valve testing were revised. Both Unit 1 and 2 IST Program documentation were reviewed for additional discrepancies and none were identified.

Technical Specification 4.0.5 requires inservice testing of code class I, II and III valves in accordance with Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. ASME Section XI requires that code class I and II power operated valves are stroke time tested to the position required to fulfill their function at least once every 3 months in order to identify potential operational problems. MOV-1CH-115B and D are code class II valves. Failure to stroke time test these valves in the closed direction was a violation of TS 4.0.5. However, the safety significance of not testing these valves in the closed direction was low as valve degradation would have been identified through the performance of other testing. This testing included: weekly valve stroke testing; quarterly stroke time testing in the open direction; and, Generic Letter 89-10, "Motor Operated Valve Program Performance Testing." Therefore, this failure to stroke time test MOV-1CH-115B and D in the closed direction constitutes a violation of minor significance and is not subject to formal enforcement action.

c. Conclusion

The Inservice Testing Program engineer identified two safety related valves which were not being fully tested in accordance with TSs. Comprehensive corrective actions were implemented.

E8.2 Year 2000 (Y2K) Readiness: (TI 2515/141)

On July 1, 1999, Duquesne Light Company (DLC) responded to NRC Generic Letter 98-01 to provide information concerning Y2K readiness at the Beaver Valley Power Station. On September 28, DLC reported completion of all items pertaining to the open Y2K issues. The inspector reviewed the five systems that remained to be remediated to achieve Y2K readiness. The Unit 1 Plant Monitoring and Trending Computer (IPC), Unit 2 Plant Monitoring and Trending Computer (PCS), Unit 2 Emergency Response Facility Monitoring and Trending Computer (ERFCS), Atmospheric Radioactive Effluent Release Assessment System (ARERAS), and Emergency Response Data System (ERDS) remediation had been completed.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on October 21, 1999. The licensee acknowledged the findings presented.

The licensee did not indicate that any of the information presented at the exit meeting was proprietary.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observation
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 92700:	Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 93702	Prompt Onsite Response to Events at Operating Power Reactors
TI 2515/141	Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants

ITEMS OPENED, CLOSED AND DISCUSSED

Closed

55-334/99-10	LER	Unit 1 Manual Reactor Trip Due to Main Unit Generator Voltage Regulator Malfunction (Section O8.1)
50-412/99-08	LER	Failure to Comply with Technical Specifications Due to Not Meeting SR 4.8.1.1.2.f, "Simultaneous Start Test of Emergency Diesel Generators" (Section M8.1)
50-334(412)/99-05	LER	Inadequate Meteorological Wind Speed Instrumentation Calibration Range Led to Failure to Comply with Technical Specifications (Section M8.2)
50-334/99-09	LER	Missed Surveillance of Component Cooling Water System 10" to 8" Header Cross-Connect Inlet Isolation Valve 1CCR-42 (Section M8.3)
50-334/99-08	LER	Missed Inservice Testing Program Surveillance Attribute (Section E8.1)

LIST OF ACRONYMS USED

ACB	Air Current Breaker
AFW	Auxiliary Feedwater
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CR	Condition Report
DC	Direct Current
DLC	Duquesne Light Company
EHC	Electro-hydraulic Governor Control
ISEG	Independent Safety Evaluation Group
IST	Inservice Testing
kV	Kilovolt
LAR	License Amendment Request
LER	Licensee Event Report
MCC	Motor Control Center
MOV	Motor Operated Valve
mph	Miles Per Hour
MSP	Maintenance Surveillance Procedure
MUG	Main Unit Generator
NRC	Nuclear Regulatory Commission
NSS	Nuclear Shift Supervisor
OMCN	Operation Manual Change Notice
OST	Operational Surveillance Test
PO	Plant Operator
RWST	Refueling Water Storage Tank
SI	Safety Injection
SLAM	Safety and Licensing Administrative Manual
TM	Temporary Modification
TOP	Temporary Operating Procedure
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VDC	Volt Direct Current
VR	Voltage Regulator
WO	Work Order
Y2K	Year 2000