May 6, 2005

Mr. William Pearce
Site Vice President, Beaver Valley Power Station
First Energy Nuclear Operating Company
Post Office Box 4
Shippingport, Pennsylvania 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC INTEGRATED INSPECTION REPORT 05000334/2005002 AND 05000412/2005002

Dear Mr. Pearce:

On March 31, 2005, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Beaver Valley Power Station Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 18, 2005, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, this report documents one self-revealing finding which was of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into the corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest anything in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Beaver Valley.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

We appreciate your cooperation. Please contact me at 610-337-5069 if you have any questions regarding this letter.

Sincerely,

/RA/

Arthur Burritt, Acting Chief
Reactor Projects Branch 7
Division of Reactor Projects

Docket Nos.: 50-334, 50-412
License Nos: DPR-66, NPF-73

Enclosures: Inspection Report 05000334/2005002; 05000412/2005002
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.	50-334, 50-412
License Nos.	DPR-66, NPF-73
Report Nos.	05000334/2005002 and 05000412/2005002
Licensee:	First Energy Nuclear Operating Company (FENOC)
Facility:	Beaver Valley Power Station, Units 1 and 2
Location:	Post Office Box 4 Shippingport, PA 15077
Dates:	January 1, 2005 - March 31, 2005
Inspectors:	P. Cataldo, Senior Resident Inspector T. Moslak, Health Physicist D. Silk, Senior Emergency Preparedness Inspector G. Smith, Resident Inspector
Approved by:	A. Burritt, Acting Chief Reactor Projects Branch 7 Division of Reactor Projects

CONTENTS

SUMMARY OF FINDINGS

IR 05000334/2005002, IR 05000412/2005002; 01/01/2005 - 03/31/2005; Beaver Valley Power Station, Units 1 & 2; Operability Evaluations.

The report covered a 3-month period of inspection by resident inspectors, an announced inspection by a regional health physics inspector, and an in-office review by a senior emergency preparedness inspector. One Green non-cited violations (NCVs) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3 dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. A self-revealing, non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified, which involved maintenance procedures used for installation of mechanical seals that were not implemented correctly and did not contain appropriate quantitative acceptance criteria (e.g., torque values). This resulted in subsequent seal failure and shaft damage to the "A" river water pump. The failure was caused by incorrect bolting material installed on the mechanical seal package, contrary to approved instructions and drawings, and incorrect torque values that were specified in the work instructions.

This finding is greater than minor because it affected an attribute and objective of the Mitigating Systems Cornerstone, in that it reduced the availability and reliability of a safety-related river water pump. Specifically, the seal failure and shaft damage resulted in the unplanned unavailability of the river water pump until repairs were completed. Further, from a reliability perspective, the degraded seal increased the likelihood of failure when the pump would be required to perform its safety function during design basis events, as evidenced by its ultimate failure when the pump was placed in service in March 2005. The finding is of very low safety significance since the river water pump was out of service for less than its technical specification allowed outage time. A contributing cause to this finding is related to the corrective action subcategory of the problem identification and resolution cross-cutting area, because seal leakage was not appropriately evaluated for a period of nine months until the pump was secured due to the seal failure. (Section 1R15).

B. Licensee Identified Violations

None

REPORT DETAILS

Summary of Plant Status:

Unit 1 operated at or near 100 percent power throughout the inspection period.

Unit 2 operated at or near 100 percent power throughout the inspection period with some exceptions. On February 25, 2005, the unit experienced an unexpected trip of a heater drain pump, and reduced power to about 40 percent power. On March 4, 2005, following heater drain pump repairs, the unit raised power to 73 percent power until main condenser waterbox cleaning was accomplished, and achieved full power on March 6, 2005.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 sample)

a. Inspection Scope

The inspectors reviewed licensee actions due to the effects of elevated Ohio River water levels between January 4 - 9, 2005. Specifically, the inspectors reviewed actions taken following the entry into Abnormal Operating Procedure (AOP) 1/2OM-53C.4A.75.2, "Acts of Nature - Flood," Rev. 20, when the Ohio River water level exceeded 670 feet mean sea level. The inspectors performed plant walkdowns of the Unit 1 River Water (RW) and the Unit 2 Service Water (SW) system in the intake structure, reviewed operator logs and interviewed plant personnel to evaluate FENOC's execution of the flood AOP.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments

a. Inspection Scope

Partial System Walkdowns (71111.04 - 3 samples).

The inspectors performed three partial system walkdowns listed below during this inspection period. The inspectors evaluated the operability of the selected train or system when the redundant train or system was inoperable or unavailable, by verifying correct valve positions and breaker alignments in accordance with the applicable procedures, and consistent with applicable chapters of the UFSAR.

- On February 1, 2005, the inspectors performed a walkdown of the Unit 1 'A' train RW system while the 'B' train was out-of-service for the performance of an uncoupled run of the 'B' RW pump.

- On February 3, 2005, the inspectors performed a walkdown of the Unit 2 No. 2 Emergency Diesel Generator (EDG) ventilation system while the No. 1 EDG ventilation system was out-of-service.

- On February 15, 2005, the inspectors performed a walkdown of the Unit 2 No. 1 Emergency Diesel Generator (EDG), while the No. 2 EDG was unavailable due to voltage regulator pre-outage work activities.

Complete System Walkdown. (71111.04S - 1 sample)

The inspectors conducted a detailed review of the alignment and condition of the Unit 2 Service Water (SW) System. This system was selected based on its risk significance and the results of previous inspections. The inspectors reviewed plant drawings, abnormal operating procedures, and emergency operating procedures to determine proper equipment alignment. The inspectors evaluated existing deficiencies to determine the impact on the SW system operation. Condition reports associated with the SW system were also reviewed to verify that the licensee was adequately identifying and correcting system deficiencies. In addition, the inspectors performed a detailed review of the SW system health report and the design basis document in order to gain insights on any longstanding issues.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05 - 9 samples)

a. Inspection Scope

Fire Area Walkdowns. The inspectors reviewed the Unit 1 Updated Fire Protection Appendix 'R' Review, Rev. 16, the Unit 2 Fire Protection Safe Shutdown Report, Addendum 18, Information Notice 2005-001, "Halon Fire Extinguishing System Piping Incorrectly Connected," and selected the following nine risk significant areas for inspection:

- Unit 1 Primary Auxiliary Building 768' (Fire Area PA-1A)
- Unit 1 Primary Auxiliary Building 752' (Fire Area PA-1C)
- Unit 1 Primary Auxiliary Building 722' (Fire Area PA-1G)
- Unit 1 CO2 Storage/PG Pump Room (Fire Area CO-2)
- Unit 2 Control Building West Communication Room (Fire Area CB-6)
- Unit 2 Service Building Elevation 780' - 6" (Fire Area SB-5)
- Unit 2 North Safeguards Area (Fire Area SG-1N)
- Unit 2 South Safeguards Area (Fire Area SG-1S)

- Unit 2 Main Steam Cable Vault (Fire Area MS-1)

The inspectors reviewed the fire protection conditions of the fire areas listed above to verify compliance with criteria delineated in Administrative Procedure 1/2-ADM-1900, "Fire Protection," Rev. 8. This review, for example, included FENOCs control of transient combustibles, material condition of fire protection equipment, and the adequacy of compensatory measures for any fire protection impairments.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspectors reviewed the internal flood protection features associated with the risk significant areas listed below. A detailed walkdown of the areas was conducted and various flood protection barriers, seals, sumps and associated sump pumps and alarm circuits were inspected. Additionally, the inspectors verified that structures, systems, and components within the selected areas were consistent with the applicable design and licensing basis attributes for internal floods as described in the Updated Final Safety Analysis Report (UFSAR), and the Individual Plant Examination report.

- Unit 2 North Safeguards Area (Flood Area SG-1N)
- Unit 2 South Safeguards Area (Flood Area SG-1S)

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11 - 1 sample)

a. Inspection Scope

The inspectors observed the conduct of Unit 1 licensed operator requalification training conducted in the facility's simulator on March 14, 2005. The inspectors observed licensed operator performance relative to the following activities: effective communications, implementation of normal, abnormal and emergency operating procedures, command and control, technical specification compliance, and emergency plan implementation. The inspectors evaluated simulator fidelity to ensure major plant configurations or changes were captured in the simulator to ensure adequate training was provided. Inspectors evaluated the staff evaluators during the examination to verify identified deficiencies in operator performance were properly identified, and that identified conditions adverse to quality were appropriately entered into the licensee's corrective action program for resolution.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12 - 1 sample)

a. Inspection Scope

The inspectors evaluated Maintenance Rule (MR) implementation for the issues listed below. The inspector evaluated specific attributes, such as, MR scoping, characterization of failed SSCs, MR risk categorization of SSCs, SSC performance criteria or goals, and appropriateness of corrective actions. The inspectors verified that the issues were addressed as required by 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance of Nuclear Power Plants," and 1/2-ADM-2114, "Maintenance Rule Program Administration," Revision 0. For the selected system, the inspectors evaluated whether system performance was properly dispositioned for MR category (a)(1) or (a)(2) performance monitoring. MR System Basis Documents were also reviewed as appropriate, during the review. The following conditions were evaluated:

- CR 05-00532, "Loss of Power to AC Panel 22"

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment and Emergent Work Control (71111.13 - 6 samples)

a. Inspection Scope

The inspectors reviewed the scheduling and control of six activities, and evaluated the effect on overall plant risk. This review was conducted using the criteria contained in 10CFR50.65(a)(4); 1/2-ADM-2033, "Risk Management Program," Rev. 2; NOP-WM-2001, "Work Management Process," Rev. 2; 1/2-ADM-0804, "On-Line Work Management and Risk Assessment," Rev. 3; 1/2-ADM-2114, "Maintenance Rule Program Administrative Procedure," Rev. 0; and Conduct of Operations Procedure 1/2OM-48.1.I, "Technical Specification Compliance," Rev. 13. This inspection activity represented six samples of the following planned or emergent work activities:

- On February 01, 2005, the inspectors reviewed the licensee's risk assessment associated with the performance of a planned, uncoupled run of the Unit 1 'B' RW pump, due to the particular system configuration required to support the test.

- On February 10, 2005, Unit 2 entered a planned "yellow" risk status due to the performance of 2MSP-1.04-I, "Solid State Protection System Train 'A' Bi-Monthly

Test," Rev. 24. The inspectors reviewed the risk assessment associated with the removal of one train of solid state protection from service.

- On February 18, 2005, the inspectors reviewed the licensee's risk assessment associated with the performance of an emergent work activity associated with the Unit 1 No. 4 battery. This activity involved the jumpering of a failed cell (No. 53). The battery bus was disconnected from the battery during this activity and caused the battery to be unavailable and out of service.

- On March 11, 2005, Unit 1 entered a planned "yellow" risk status due to the performance of preventative maintenance on switchyard breaker OCB-92. This activity required the disabling of the 'A' train offsite power circuit and entry into a 72 hour Technical Specification LCO.

- On March 15, 2005, the inspectors reviewed the licensee's "yellow" risk assessment during performance of an emergent work activity on the Unit 2 'C' recirculation spray pump suction valve, 2RSS-MOV-155C, which had failed its quarterly stroke test.

- On March 7, 2005, the reliability of various 345kV switchyard breakers was identified as a concern following notification from Duquesne Light Company, which performs maintenance on various switchyard components. The inspector reviewed the technical information regarding the breaker reliability issue, corresponded with regional inspectors, and reviewed licensee actions to control risk from offsite power transients and grid-related events while testing was underway to determine the extent of the reliability issues.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14 - 3 samples)

a. Inspection Scope

The inspectors reviewed the following non-routine plant evolutions, to determine whether personnel performance caused unnecessary plant risk or challenges to reactor safety. The inspectors also reviewed plant operating logs, plant computer data, and other documents as necessary during the inspection. This inspection activity represented three samples of the following evolutions:

- The inspectors evaluated the licensee's response to an instrument air transient that occurred at Unit 2 on January 11, 2005, due to personnel error. The inspectors reviewed shift narrative logs, technical specifications (for compliance and operability concerns), alarm response procedures, and other applicable operating and surveillance procedures to verify appropriate actions were taken following the event, including the implementation of short term corrective actions.

The inspectors also reviewed CR 05-00262, which was initiated to address the event within the corrective action program.

- The inspectors evaluated licensee performance following a grid disturbance that resulted in the loss of a running station air compressor, 2SAS-C21B, on March 21, 2005. The evaluation included a review of shift narrative logs and plant computer data, discussion with various Operations department personnel, as well as verification that operator actions were in accordance with 2OM-53C.4.3.2.34.1, Rev. 7, "Loss Of Station Instrument Air."

- The inspectors evaluated licensee performance following the unexpected trip of the Unit 2 "B" Heater Drain Pump, 2HDH-P21B, on February 25, 2005. The inspectors reviewed shift narrative logs, annunciator alarm procedures, discussed the event with plant personnel, and evaluated operator performance from the control room during actual transient.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 8 samples)

a. Inspection Scope

The inspectors evaluated the technical adequacy of selected operability determinations (OD), Basis For Continued Operations (BCO), or operability assessments, to verify that operability was justified, as appropriate. In addition, where applicable, the inspectors verified that Technical Specification (TS) limiting conditions for operation (LCO) requirements and Final Safety Analysis Report design basis requirements were properly addressed. This inspection activity represented eight samples of the following issues:

- The inspectors reviewed an OD associated with Condition Report (CR) 05-00591. This CR described unexpected corrosion of the flange bolts and nuts associated with the Unit 1 'A' charging pump cooler, 1CH-E-7A. This OD concluded there was no operability concern.

- During the performance of 1MSP-1.05I, "Solid State Protection System Train 'B' Bi-Monthly Test," Rev. 25, higher than normal contact resistance was measured across contact 'P4' which provides a backup turbine trip signal. The inspectors reviewed CR 05-00830, which documented the licensee's acceptability of the identified resistance of the 'P4' contacts.

- CR 05-01058 detailed a discrepancy between the Updated Final Safety Analysis Report (UFSAR) and the current safety analysis of record regarding the assumed relief capacity of the pressurizer code safety valves.

C During a walkdown of the U2 Safeguards building, the inspectors noted an unsecured flood hatch in the 'C' recirculation spray pump cubicle. The inspectors discussed the issue with the system engineer and Operations personnel, reviewed CR 05-01627, which described the operability assessment, and reviewed the adequacy of corrective actions from a previous occurrence described in Licensee Event Report 97-002-00.

- The inspectors reviewed an OD associated with CR 05-01630. This OD was generated following the failure of the mechanical seal of the "A" River Water (RW) Pump on March 9, 2005. Additionally, the inspectors reviewed the adequacy of extent of condition evaluations regarding the remaining 'B' and 'C' RW pumps.

- The inspectors reviewed the adequacy and scope of an OD associated with CR-05-00529, regarding foreign material identified as metal shavings that was inadvertently introduced into the alternate intake structure bay. The inspectors evaluated the licensee's conclusion that Emergency Service Water Pump 2SWE-P21A, was operable.

- The inspectors reviewed the adequacy and scope of an operability assessment associated with CR-05-00696. This CR addressed operability concerns regarding dust and debris in the ductwork of the Unit 1 Control Room Post Accident Filtration System.

- The inspectors reviewed the adequacy and scope of an operability assessment associated with CR-05-01465. This assessment addressed the Unit 1 monthly void monitoring conducted in accordance with 3BVT01.11.04, Rev. 0, "Void Monitoring," that identified two voids in the charging pump suction and low head safety injection system piping. The inspector evaluated the void sizes relative to pre-determined acceptance criteria to determine the acceptability of the licensee's determination of operability.

b. Findings

Ineffective Procedural Controls caused a Mechanical Seal Failure on the Unit 1 'A' River Water Pump

Introduction. A Green, self-revealing NCV was identified for not adequately developing and implementing a maintenance procedure associated with replacing the mechanical seal on the Unit 1 'A' river water (RW) pump as required by 10CFR50 Appendix B Criterion V, "Instructions, Procedures, and Drawings."

Description. On March 9, 2005, the Unit 1 'A' RW pump was placed in service following restoration of the 'A' intake bay due to associated maintenance. Approximately one hour later, the pump was shut down due to excessive mechanical seal leakage and loud rubbing noises. The 'C' RW pump was placed in service and the appropriate RW Technical Specification 3.7.4.1 was exited. Disassembly of the seal revealed that the

seal mounting bolts had relaxed and the unsecured seal halves damaged the pump shaft. An event response team was formed to determine the apparent cause for the seal failure. The team noted that the seal mounting bolts were made of the wrong material (B7 carbon steel versus the required B8M stainless steel), and were not properly tightened. Subsequently, the licensee replaced the damaged shaft section, installed a new mechanical seal package with the correct seal mounting bolts, and applied the proper seal mounting torque; the 'A' RW pump was returned to service on March 15, 2005.

The inspectors noted that leakage was immediately identified during the post-maintenance run in May of 2004, and a followup work order was generated on June 24, 2004 to address the leaking seal. However, the leakage continued to increase without adequate licensee evaluation, as evidenced by the installation of a splash guard to prevent water spray outside the pump housing and the fact that no repairs were made until the seal failed on March 9, 2005.

Analysis. The finding is greater than minor because it affected an attribute and objective of the mitigating systems cornerstone, in that it reduced the availability and reliability of a safety-related RW pump. Specifically, the seal failure and shaft damage resulted in the unplanned unavailability of the RW pump until repairs were completed. Further, from a reliability perspective, the degraded seal increased the likelihood of failure when the pump would be required to perform its safety function during design basis events, as evidenced by its ultimate failure when the pump was placed in service in March 2005.

The inspectors evaluated this finding using a Phase 1 analysis from Appendix 'A' of Manual Chapter 0609, "Significance Determination Process," and determined this finding to be of very low safety significance, or Green. This conclusion was reached because although the failed river water pump represented a loss of safety function of a single train, it did not result in a loss of an entire system safety function, was inoperable for less than the Technical Specification allowed outage time of 72 hours, and did not involve a fire, seismic, or severe weather initiating event. A contributing cause to this finding is related to the corrective action subcategory of the problem identification and resolution cross cutting area. Specifically, because seal leakage was not appropriately evaluated for a period of nine months until the pump was secured due to the seal failure.

Enforcement. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires in part, that activities affecting quality shall be prescribed by, and be accomplished in accordance with, documented instructions, procedures or drawings, and shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Contrary to the above, maintenance procedures used for installation of mechanical seals were not implemented correctly and did not contain appropriate quantitative acceptance criteria (e.g., torque values). This resulted in subsequent seal failure and shaft damage to the "A" river water pump. The failure was caused by incorrect bolting material installed on the mechanical seal package, contrary to approved instructions and drawings, and incorrect torque values that were specified in the work instructions. Because this

deficiency was of very low safety significance and has been entered into the corrective action program as CR 05-01630, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000334/2005002-01, Ineffective Procedural Controls caused a Mechanical Seal Failure on the Unit 1 'A' River Water Pump.

1R19 Post-Maintenance Testing (71111.19 - 7 samples)

a. Inspection Scope

The inspectors reviewed and/or observed selected post-maintenance tests (PMTs) to ensure: 1) the PMT was appropriate for the scope of the maintenance work completed; 2) the acceptance criteria were clear and demonstrated operability of the component, consistent with the applicable design and licensing bases and associated safety functions; and 3) the PMT was performed in accordance with applicable procedures. This inspection activity represented seven samples of the following issues:

- 1OST-30.3, "Reactor Plant River Water Pump 1B Test," Rev. 36 and 1BVT2.30.2, "River Water Pump [1WR-P-1B] Head Capacity Curve Test," Rev. 8, performed on February 4, 2005, following rotating assembly replacement and motor overhaul of the Unit 1 'B' RW pump.

- 2OST-30.1B, "Standby Service Water Pump [2SWE-P21B] Test, Rev. 21, performed on February 12, 2005, following a planned overhaul of the Unit 2 'B' Standby SW pump.

- 2OST-24.4, "Steam Driven Auxiliary Feed Pump [2FWE*P22] Quarterly Test," Rev. 55, performed on March 8, 2005, following preventative maintenance on the trip and throttle valve.

- 2OST-36.1, "Emergency Diesel Generator [2EGS*EG2-1] Monthly Test," Rev. 45, performed on March 17, 2005, following replacement of the field flash relay under Engineering Change Package 03-0491.

- 2OST-47.3Q, "Containment Penetration and ASME Section XI Valve Test - Work Week 12," Rev. 2 performed on March 16 following an emergent replacement of the torque switch on Unit 2 'C' Recirculation Spray pump suction isolation valve, "2RSS*MOV155C."

- 1OST-7.04, Rev. 29, "Centrifugal Charging Pump Test [1CH-P-1A]," performed on February 25, 2005, following planned maintenance activities on the "A" Charging Pump.

- 1MSP-6.40-I, Rev. 3, "T-RC432 Delta T TAVG Protection Instrument Channel III Calibration," performed on March 20-21, 2005, following module replacements in the protection loop.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20 - 1 partial sample)

a. Inspection Scope

The inspectors evaluated selected receipt, movement and inspection activities associated with new fuel assemblies in preparation for the Unit 2 refueling outage, 2R11. The inspectors verified activities were performed in accordance with OMM-16, Rev. 8, "Site Receipt and Handling of New Fuel Assemblies and Shipping Containers." In addition, the inspectors verified appropriate fuel movement accountability was maintained.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 samples)

a. Inspection Scope

The inspectors observed and/or reviewed selected operational surveillance tests. This review verified that the equipment or systems were capable of performing their intended safety functions and to ensure compliance with related Technical Specifications, Final Safety Analysis Report, and applicable procedural requirements. This inspection activity represented five samples of the following tests:

- 2RST-2.5, "Moderator Temperature Coefficient Determination," Rev. 4.
- 1OST-24.4, "Steam Turbine Driven Auxiliary Feed Pump Test [1FW-P-2]," Rev. 28.
- 2OST-11.1, "Low Head Safety Injection Pump [2SIS*P21A] Test," Rev. 21.
- 1OST-6.2, "Reactor Coolant System Water Inventory Balance, Rev. 18 and 2OST-6.2A, "Computer Generated Reactor Coolant System Water Inventory Balance," Rev. 19.
- 2OST-2.4A, Rev. 4, "Quadrant Power Tilt Ratio Manual Calculation."

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 1 sample)

a. Inspection Scope

The inspectors reviewed the following temporary modifications (TM) based on risk significance. The TM and associated 10CFR50.59 screening was reviewed against the system design basis documentation, including the FSAR and the TS. The inspectors verified the TM was implemented in accordance with Administrative Procedure, 1/2-ADM-2028, "Temporary Modifications," Rev. 3.

- Unit 2 TM 2-04-016, Rev. 0, "Loop Power Supply 2SIS-PPW925 Calibration Adjustment."

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System (ANS) Testing (71114.02 - 1 Sample)

a. Inspection Scope

An onsite review of the licensee's ANS was conducted to ensure prompt notification of the public for taking protective actions. During the inspection, the inspector reviewed the test and maintenance documentation for the siren system. Condition Reports (CRs) generated as a result of siren testing or monitoring were reviewed for causes, trends and corrective actions. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 02, and the applicable planning standard, 10 CFR 50.47(b)(5) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation Testing (71114.03 - 1 Sample)

a. Inspection Scope

A review of Beaver Valley's ERO augmentation staffing requirements and the process for notifying the ERO was conducted to ensure the readiness of key staff for responding to an event and timely facility activation. The inspector reviewed ERO response drills (call-in and come-in) in 2004 and the associated CRs. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, and the applicable

planning standard, 10 CFR 50.47(b)(2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

a. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) Revision Review (71114.04 - 1 Sample)

a. Inspection Scope

During this inspection, the inspector sampled licensee assessments of decreases in the effectiveness for recent changes to emergency preparedness documents. A thorough review was conducted of plan aspects related to the risk significant planning standards (RSPS), such as classifications, notifications and protective action recommendations. A cursory review was conducted for non-RSPS portions. The inspector also evaluated the licensee's capability to classify events related to earthquakes. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05 - 1 Sample)

a. Inspection Scope

The inspector reviewed CRs initiated by Beaver Valley from drills, tests, and audits and the associated corrective actions to determine the significance of the issues and to determine if repeat problems were occurring. A list of CRs are contained in an attachment to this report. Also, the 2004 audit reports were reviewed to assess Beaver Valley's ability to identify issues, assess repetitive issues and the effectiveness of corrective actions through their independent audit process. This inspection was conducted according to NRC Inspection Procedure 71114, Attachment 05, and the applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency plan mini-drill conducted on March 24, 2005. Operator and event personnel performance regarding event notifications were specifically evaluated. The inspector evaluated the simulator-based drill that involved multiple safety-related component failures and plant conditions that warranted emergency plan activation, emergency facility activation, and escalation through the ultimate event classification of Site Area Emergency. The licensee counted this evolution toward Emergency Preparedness Drill/Exercise Performance (DEP) Indicators, therefore, the inspectors reviewed the applicable event notifications to determine whether they were appropriately credited, and properly evaluated consistent with Nuclear Energy Institute (NEI) 99-02, Rev. 2, "Regulatory Assessment Performance Indicator Guideline." The inspectors attended the Technical Support Center critique, and reviewed all other critiques to ensure appropriate adverse conditions were appropriately entered into the Corrective Action Program. Other documents utilized in this inspection include the following:

- 1/2-ADM-1111, Rev. 1, "NRC EPP Performance Indicator Instructions"
- EPP/I-1a, Rev. 5, "Recognition and Classification of Emergency Conditions"
- 1/2-EPP-I-2, Rev. 20, "Unusual Event"
- 1/2-EPP-I-3, Rev. 19, "Alert"
- 1/2-EPP-I-4, Rev. 19, "Site Area Emergency"

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01 - 11 Samples)

a. Inspection Scope

During the period February 14 - 18, 2005, the inspector conducted the following activities to verify that the licensee was properly implementing physical, administrative, and engineering controls for access to locked high radiation areas, and other radiologically controlled areas during power operations, and that workers were adhering to these controls when working in these areas. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, Technical Specifications, and the licensee's procedures. This inspection activity represents the completion of eleven (11) samples relative to this inspection area.

Plant Walkdown and RWP Reviews

- The inspector identified exposure significant work areas in the Unit 1 Auxiliary Building. Tasks being performed included a charging pump (1-CH-P-1A) repair and change-out of a spent fuel pool filter (1-FC-FL-1A). The inspector reviewed the applicable radiation work permits (RWPs), 105-1028 and 105-1030, respectively, and the radiation survey maps associated with the work areas to determine if the radiological controls were acceptable.

- The inspector toured accessible radiological control areas in Units 1 and 2, and with the assistance of a radiation protection technician, performed independent radiation surveys of selected areas to confirm the accuracy of survey data and the adequacy of postings.

- The inspector reviewed electronic dosimeter dose/dose rate alarm setpoints to determine if the setpoints were consistent with the survey indications and plant policy. The inspector verified that the workers were knowledgeable of the actions to be taken when the electronic dosimeter alarms or malfunctions for tasks being conducted under selected RWPs. Work activities reviewed included Unit 1 spent fuel pool filter change-out (105-1030), and Unit 1 charging pump repair (105-1028).

- The inspector reviewed the RWPs and associated instrumentation and engineering controls for potential airborne radioactivity areas. Through review of relevant condition reports and dosimetry records, and discussions with cognizant plant staff, the inspector confirmed that no worker received an internal dose in excess of 50 mRem due to airborne radioactivity in 2004.

- The inspector reviewed the physical and procedural controls for highly activated/contaminated materials stored in the Unit 1 and 2 spent fuel pools.

Problem Identification and Resolution

The inspector reviewed elements of the licensee's Corrective Action Program related to controlling access to radiologically controlled areas, completed since the last inspection of this area, to determine if problems were being entered into the program for resolution. Details of this review are contained in Section 4OA2 of this report.

Jobs-In-Progress

The inspector observed various maintenance activities to verify that radiological controls, such as required surveys, area postings, job coverage, and pre-job RWP briefings were conducted; personnel dosimetry was properly worn; and that workers were knowledgeable of work area radiological conditions. The inspector attended the pre-job RWP briefings and observed selected aspects of repairing a Unit 1 charging pump and changing out a Unit 1 spent fuel pool filter.

High Risk Significant, High Dose Rate HRA, and VHRA Controls

The inspector discussed with Radiological Operations Supervision High Dose Rate (HDR) areas and Very High Radiation Areas (VHRA) controls and procedures. The inspector verified that any changes to relevant licensee procedures did not substantially reduce the effectiveness and level of worker protection. The inspector evaluated the prerequisite communications and authorizations that would allow entry into potentially high dose rate areas. Additionally, the inspector reviewed the controls for entries into the Unit 1 and 2 containment buildings during power operations.

Keys to Unit 1 and Unit 2 locked high radiation areas (LHRA) and very high radiation areas were inventoried and accessible LHRAs were verified to be properly secured and posted during plant tours.

The inspector discussed with the project lead and reviewed the documents related to the radiological controls to be implemented for replacement and storage of the Unit 1 reactor head and steam generators during the 2006 Unit 1 outage.

Radiation Worker/Radiation Protection Technician Performance

The inspector observed radiation worker and radiation protection technician performance by reviewing daily Health Physics Department log entries, and attending various RWP pre-job briefings, an ALARA Committee meeting, and a morning departmental staff meeting.

The inspector reviewed condition reports related to radiation worker and radiation protection technician errors to determine if an observable pattern traceable to a similar cause was evident.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151- 3 Samples)

a. Inspection Scope

The inspector reviewed the licensee's procedure for developing the data for the Emergency Plan (EP) Performance Indicators (PIs) which are: (1) Drill and Exercise Performance; (2) Emergency Response Organization Drill Participation; and (3) Alert and Notification System (ANS) Reliability. The inspector also reviewed the licensee's 2004 drill/exercise reports, training records and ANS testing data to verify the accuracy of the reported data. Data generated since the May 2004 EP PI verification was

reviewed during this inspection, which included the second, third and fourth quarters of 2004. The review was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria used for the review were 10 CFR 50.9 and NEI 99-02, Revision 1, Regulatory Assessment Performance Indicator Guideline.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

1. Inspection Module Problem Identification and Resolution (PI&R) Review

a. Inspection Scope

The inspectors reviewed various CRs associated with the inspection activities captured in each inspection module of this report. During this review, the inspectors assessed the fundamental ability of the licensee to identify adverse conditions, and verified the licensee had entered these issues into the corrective action program for resolution. Where applicable, CRs reviewed during the inspection are documented under each module, or under Section 40A2; however, for reviews that entailed large number of CRs, these are more appropriately documented in the Attachment.

b. Findings

No findings of significance were identified.

2. Daily Condition Report Review

a. Inspection Scope

As required by Inspection Procedure 71152, “Identification and Resolution of Problems,” and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee’s corrective action program. This review was accomplished by reviewing each condition report, attending daily screening meetings, and accessing the licensee’s computerized corrective action program database.

b. Findings

No findings of significance were identified.

3. Access Control to Radiologically Significant Areas

a. Inspection Scope

The inspector reviewed 13 Condition Reports, recent ALARA Committee meeting minutes, and Nuclear Quality Assessment field observation reports to evaluate the licensee's threshold for identifying, evaluating, and resolving occupational radiation safety problems. This review included a check of possible repetitive issues such as radiation worker and radiation protection technician errors.

b. Findings

No findings of significance were identified.

4. Cross-References to PI&R Findings Documented Elsewhere

Section 1R15 describes a finding for not implementing adequate corrective actions to preclude a pump mechanical seal failure of the Unit 1 'A' RW pump. Consequently, ineffective installation and subsequent failure to correct a condition adverse to quality impacted the RW pump's reliability and availability. This finding exhibited problem identification and resolution cross cutting aspects because the deficient condition of leaking seal package was not effectively resolved.

5. Annual Sample Review (71152 - 1 sample)

Performancer Indicator Unavailability Interpretation

a. Inspection Scope and Observations

The inspectors reviewed the licensee's assessment under CR-04-02267, regarding the proper interpretation of availability during solid state protection system (SSPS) testing. Previous licensee interpretations had determined that the SSPS functions associated with auxiliary feedwater, high head safety injection, and recirculation functions were available, based on NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." However, the licensee subsequently determined through their investigation, and from guidance from the Frequently Asked Question (FAQ) section of the NRC Performance Indicator program, that availability credit cannot be taken since the specific details of recovery are not consistent with the guidance contained in NEI 99-02 for availability credit.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

On April 18, 2005, the inspectors presented the inspection results to Mr. Bill Pearce and other members of his staff. The licensee had no objections to the NRC's observations. The inspector confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

C. Bibbee	Senior Nuclear Specialist
J. Contreras	Adv. Nuclear Specialist
J. Freund	Supervisor, Rad Operations Support
J. Gagliano	Supervisor, Nuclear Security Shift
K. Halliday	Security Manager
R. Harris	Senior Nuclear Specialist
A. Hartner	Shift Manager, Unit 1
M. Helms	Steam Generator Replacement Project, Radiation Protection Specialist
J. Lash	Plant Manager
J. Lebda	Senior Nuclear Specialist, Dosimetry
T. McGourty	System Engineer
D. McNair	Senior Radiation Protection Technician
R. Moore	Radiation Protection Supervisor
P. Pauvlinch	Rapid Response Supervisor
R. Pucci	Senior Nuclear Specialist, ALARA Coordinator
J. Radant	Senior Radiation Protection Technician
M. Rice	Adv. Nuclear Specialist
P. Sena	Operations Manager
B. Sepelak	Supervisor, Regulatory Compliance
J. Sipp	Radiation Protection Manager
H. Szklinski	Senior Nuclear Specialist
S. Vacinie	Emergency Preparedness Manager
R. Vento	Steam Generator Replacement Project, Radiation Protection Lead
J. Witter	Shift Manager, Unit 2
T. Zyra	Senior Consultant

NRC Personnel:

R. Bhatia	Reactor Inspector

LIST OF ITEMS, OPENED, CLOSED, AND DISCUSSED

Open/Closed

05000334/2005002-01	NCV	Ineffective Procedural Controls Caused a Mechanical Seal Failure on the Unit 1 'A' River Water Pump. (Section 1R15)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignments

Drawings

8770-RM-430-1, "River Water System," Rev. 24
8770-RM-430-2, "River Water System," Rev. 17
8770-RM-430-3, "River Water System," Rev. 18
8770-RM-430-4, "River Water System," Rev. 16
8770-RM-430-5, "River Water System," Rev. 18
10080-RM-444F-4, "Diesel Generator Room and Aux Boiler Room," Rev. 3
10080-RM-430-1, "Service Water Supply and Distribution," Rev. 28
10080-RM-430-1A, "Standby Service Water Supply," Rev. 4
10080-RM-430-2, "Service Water Primary Cooling" Rev. 29
10080-RM-430-3, "Service Water Primary Cooling," Rev. 16
10080-RM-430-4, "Service Water Secondary Cooling," Rev. 12

Procedures

1OM-30.3.B.1, "Valve List - 1RW," Rev. 36
1OM-30.3.C, "Power Supply and Control Switch List," Rev. 17
2OM-44F.3.D.1, "Diesel Room Ventilation System Startup Checkoff List," Rev. 1
2OM-44F.3.B.1, "Valve List - 2HVD," Rev. 4
2OM-44F.3.B.2, "Valve List - 2HVI," Rev. 3
2OM-44F.3.B.3, "Valve List - 2HVK," Rev. 3
2OM-44F.3.B.5, "Valve List - 2HVT," Rev. 3
2OM-44F.3.B.6, "Valve List - 2HVW," Rev. 3
2OM-44F.3.B.7, "Valve List - 2HVZ," Rev. 3
2OM-44F.1.C, "Major Components," Rev. 1
2OM-44F.1.D, "Instrumentation and Control," Rev. 3
2OM-30.3.B.1, "Valve List - 2SWS," Rev. 35
2OM-30.3.C, "Power Supply and Control Switch List," Rev. 17
2OM-30.1.C, "Major Components," Rev. 3
2OM-30.1.D, "Instrumentation and Control," Rev. 7
2OM-53C.4.2.30.1, "Service Water/Normal Intake Structure Loss," Rev. 6

Section 1R05: Fire Protection

Condition Reports

CR 00-02103 CR 05-00363

Miscellaneous

Information Notice 2005-01, "Halon Fire Extinguishing system Piping Incorrectly Connected."

Section 1R11: Licensed Operator Requalification

Miscellaneous

Drill scenario 1DRLS-E-1.004

Section 1R12: Maintenance Rule Implementation

Drawings

- 8700-RE-1GE, "One-Line Diagram 120VAC PNL-AC-22 & PNL-AC-23," Rev 10
- 8700-RE-11BD, "Wiring Diagram: ERF SS Breakers, Transformers, Switches," Rev 4
- 8700-RE-11J, "Wiring Diagram: 120/208V Distribution Panels 22 & 23," Rev 18
- 8700-RE-1G, "480V One Line Diagram - Sh1," Rev 15

Condition Reports

CR 04-04938 CR 04-05897

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

Calculation

8700.39.10, "Station Battery #4 - Electrical Capability With Reduced No. Of Cells"

Work Orders

WO 200104686

Section 1R15: Operability Evaluations

Condition Reports

CR 05-00591 CR 05-00830 CR 05-01058 CR 05-01627
CR 05-01630

Vendor Technical Manual (VTM)

VTM 8700-02.042-0048, "John Crane Type 3710 Cartridge Split Seal," Rev. E

Section 1R19: Post-Maintenance Testing

Procedures and other Documents

1/2-CMP-—7-001, Rev. 5, “High Head Safety Injection Charging Pump Overhaul”
Problem Solving Plan for CR-05-01125
Calculation 8700-DEC-0237, Rev. 0, “Verification of Existing Time Constant Dynamic Test Voltages in Unit 1 RPS and ESFAS Instrument Surveillance Procedures”
Calculation 8700-DEC-0226, Rev. 1, “Determination of Instrument Scaling Voltages for Unit 1 Technical Specifications Tables 3.3-1, 3.3-3, and LRM Tables 3.9-1, 3.9-2"

Drawings

10080-E-6HB, “Elementary Diagram 480V MCC Ckts Recirc Spray Pump Suc Valves,” Rev. 13

Work Orders

WO 200144597
WO200135445
WO200085814 (Unit 1 Charging pump maintenance activites)
WO200145093 (Unit 1 Delta-T/Tave Calibration)

Condition Reports

05-00826	05-01177	05-01147	05-01179
05-00921	05-00807	05-00834	05-01111
05-01097	05-01223	05-01125	05-01096

Section 1R20: Refueling and Outage Activities

Work Orders

WO 200144597
WO200135445

Section 1R22: Surveillance Testing

Reactor Engineering Data Book

Condition Reports

CR 05-00388 CR 05-00418

Section 1EP2: Alert and Notification System (ANS) Testing

Duquesne Light Company Beaver Valley Nuclear Facility Design Report Emergency Warning Notification System, 03/01/89
Supplement to the BVPS Emergency Warning Notification System Design Report
Alert Notification System (Sirens) Maintenance and Testing, Rev 1

Section 1EP3: Emergency Response Organization (ERO) Augmentation Testing

FENOC Administrative Program for Computer Related Activities, Rev 3
1/2-EPP-IP-1.1, Notifications, Rev 32
1/2-EPP-I-3, Alert, Rev 19
Emergency Response Organization Administration, Rev 3

Section 1EP4: Emergency Action Level (EAL) Revision Review

1/2OM-53C.4A.75.3, Acts of Nature - Earthquake, Rev 9
EPP/I-1a&1b, Recognition and Classification of Emergency Conditions, Rev 5

Section 1EP5: Correction of Emergency Preparedness Weaknesses and Deficiencies

1/2-EPP-IP-4.1, Offsite Protective Actions, Rev 18

Condition Reports for 2004

00212	00513	01867	02048	02350	03011
03268	03457	04053	04054	04057	04063
04064	04066	04071	04077	04081	04108
04232	04290	04475	04495	04966	06747
06776	06856	07313	09495	09522	09805
09836	09994				

Condition Reports for 2005

00693	00610	00891	00617	00881	00969

1EP6: Drill Evaluation

1/2-EPP-IP-1.1, Rev. 32, “Notifications”
1/2-EPP-IP-1.4, Rev. 24, “Technical Support Center Activation, Operation, and Deactiviation”

Sections 2OA1: Access Control to Radiologically Significant Areas

Procedures:

1/2-ADM-1601, Rev 10	Radiation Protection Standards
1/2-ADM-1611, Rev 6	Radiation Protection Administrative Guide

1/2-ADM-1621, Rev 3	ALARA Program
1/2-ADM-1630, Rev 6	Radiation Worker Practices
1/2-ADM-1631, Rev 5	Exposure Control
1/2-HPP-3.02.003, Rev 3	Decontamination Control
1/2-HPP-3.02.004, Rev 4	Area Posting
1/2-HPP-3.05.001, Rev 3	Exposure Authorization
1/2-HPP-3.07.002, Rev 3	Radiation Survey Methods
1/2-HPP-3.07.013, Rev 2	Barrier Checks
1/2-HPP-3.08.001, Rev 8	Radiological Work Permit
1/2-HPP-3.08.005, Rev 4	ALARA Review Program
BVBP-RP-0003, Rev 2	Dosimetry Practices

Nuclear Oversight Assessment Reports:
NQAR Field observations: BV1200051967, BV120051974, BV220051993, BV320051951, BV120051967, BV220051977

Condition Reports (13):
05-00033, 04-05570, 04-07690, 04-00149, 04-09755, 04-09356, 04-09154, 04-07538, 04-08664, 04-08397, 04-08646, 05-00916, 05-00992

ALARA Council Meeting Minutes:
Meeting 05-01, 04-21, 04-20

Radiation Protection Performance Review Committee Reports:
January 2005, December 2004

Miscellaneous Reports:
Unit 1 and Unit 2 Radiation Protection Department Shift Logs
Steam Generator Replacement Project Plan

Section 4OA1 Performance Indicator (PI) Verification:

BVBP-RAS-006	PI Data Compilation and Submittal, Rev 3
BVBP-RAS-005	NRC Performance Indicators, Rev 7

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
ANS	Alert and Notification System
AOP	Abnormal Operating Procedure
BCO	Basis For Continued Operations
BVPS	Beaver Valley Power Station
CFR	Code of Federal Regulations
CR	Condition Report
DEP	Drill and Exercise Performance

EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ERO	Emergency Response Organization
FENOC	First Energy Nuclear Operating Company
HDR	High Dose Rate
HRA	High Radiation Area
LCO	Limiting Condition for Operation
MR	Maintenance Rule
mRem	Millirem
NRC	Nuclear Regulatory Commission
OD	Operability Determination
OM	Operating Manual
OST	Operations Surveillance Test
PI	Performance Indicator
PI&R	Problem Identification and WO
PMT	Post-Maintenance Test
RSPS	Risk Significant Planning Standard
RW	River Water
RWP	Radiation Work Permit
SSC	System, Structure, and Component
SW	Service Water
TM	Temporary Modification
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Area
WO	Work Order