

January 24, 2007

Mr. James Lash  
Site Vice President, Beaver Valley Power Station  
FirstEnergy Nuclear Operating Company  
Post Office Box 4  
Shippingport, Pennsylvania 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC INTEGRATED INSPECTION  
REPORT 05000334/2006005 AND 05000412/2006005

Dear Mr. Lash:

On December 31, 2006, 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 January 18, 2007, with Mr. Peter Sena 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, no findings of significance were identified. However, licensee-identified violations which were determined to be of very low safety significance are listed in this report. NRC is treating these violations as non-cited violations (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy because of the very low safety significance of the violations and because they are entered into your corrective action program. If you contest any of the findings 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).

J. Lash

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We appreciate your cooperation. Please contact me at 610-337-5200 if you have any questions regarding this letter.

Sincerely,

***/RA by Scott Barber Acting For/***

Ronald R. Bellamy, Ph.D., Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

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

Enclosures: Inspection Report 05000334/2006005; 05000412/2006005  
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. 05000334/2006005 and 05000412/2006005

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Post Office Box 4  
Shippingport, PA 15077

Dates: October 1, 2006 through December 31, 2006

Inspectors: P. Cataldo, Senior Resident Inspector  
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Approved by: R. Bellamy, Ph.D., Chief  
Reactor Projects Branch 7  
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## SUMMARY OF FINDINGS

IR 05000334/2006005, IR 05000412/2006005; 10/01/2006 - 12/31/2006; Beaver Valley Power Station, Units 1 & 2; Routine Integrated Report.

The report covered a 3-month period of inspection by resident inspectors, regional reactor inspectors, and a regional health physics inspector. No findings of significance were identified. 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

No findings of significance were identified.

B. Licensee-Identified Violations

Three violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective actions are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status:

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

Unit 2 began the inspection period at 100 percent power. On October 2, the unit was taken off-line for a planned refueling outage (Section 1R20). The unit was defueled on October 11 with all fuel assemblies transferred to the spent fuel pool. Fuel assemblies were reloaded into the reactor vessel on October 21. The unit returned on-line on November 12. On November 17, a loss of feedwater heating transient occurred, and the unit was down-powered to approximately 40 percent (Section 4OA3). Following feedwater heater tuning, the unit realized a 3 percent power uprate and returned to full-power on November 19 (Section 4OA5). The unit continued to operate at or near full-power for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity**

1R01 Adverse Weather Protection (711111.01 - 2 samples)

.1 Seasonal Site Inspection (1 sample)

a. Inspection Scope

The inspectors reviewed the Beaver Valley Power Station (BVPS) design features and FENOC's implementation of procedures to protect risk significant mitigating systems from cold weather conditions and high winds. The inspectors walked down risk significant plant areas for several days in November and December 2006 and assessed FENOC's protection activities for cold weather conditions. The inspectors were sensitive to outside instrument line conditions and the potential for unheated ventilation. The walkdown included the emergency diesel generator rooms, low head safety injection and service/river water systems. The inspectors also reviewed 1OST-45.11, "Cold Weather Protection Verification," Rev. 16 and 2OST-45.11, "Cold Weather Protection Verification," Rev. 17. Other documents that were reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 System Inspection (1 sample)

a. Inspection Scope

The inspectors reviewed the readiness of the Unit 2 emergency diesel generators for extreme weather conditions, specifically, cold temperatures, high winds, and other

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relevant severe weather events. The inspection verified that the indicated equipment, its instrumentation, and supporting structures were configured in accordance with FENOC's procedures and that adequate controls were in place to ensure functionality of the system. The inspectors reviewed licensee procedures and walked down the system. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial System Walkdowns (71111.04 - 3 samples)

a. Inspection Scope

The inspectors performed partial equipment alignment inspections, during conditions of increased safety significance, including when redundant equipment was unavailable during maintenance or adverse conditions. The partial alignment inspections were also completed after equipment was recently returned to service after significant maintenance. The inspectors performed partial walkdowns of the following systems, including associated electrical distribution components and control room panels, to verify the equipment was aligned to perform its intended safety functions:

- Unit 2 'A' Service Water system on October 19, 2006;
- Unit 1 'A' River Water System on October 24, 2006, following restoration from a pump maintenance outage period; and
- Unit 1 'B' Emergency Diesel Generator on December 20, 2006, while it was a protected train.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown (71111.04S - 1 sample)

a. Inspection Scope

The inspectors completed a detailed review of the alignment and condition of the Unit 2 125VDC System. The inspectors conducted a walkdown of the system to verify that the critical portions, such as batteries, switches, breakers, and motor control centers (MCC) were correctly aligned in accordance with procedures, and to identify any discrepancies that may have had an effect on operability.

The inspectors also conducted a review of outstanding maintenance work orders to verify that the deficiencies did not significantly affect the 125VDC system function. In addition, the inspectors reviewed the condition report database to verify that equipment



alignment problems were being identified and appropriately resolved. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05 - 7 samples)

Quarterly Sample Review (71111.05Q)

a. Inspection Scope

The inspectors reviewed the conditions of the fire areas listed below, to verify compliance with criteria delineated in Administrative Procedure 1/2-ADM-1900, "Fire Protection," Rev. 14. This review included FENOC's control of transient combustibles and ignition sources; material condition of fire protection equipment including fire detection systems, water-based fire suppression systems, gaseous fire suppression systems, manual firefighting equipment and capability, passive fire protection features, and the adequacy of compensatory measures for any fire protection impairments. Documents reviewed are listed in the Attachment:

- Unit 2 Primary Reactor Containment (Fire Area RC-1);
- Unit 1 Turbine Building (Fire Zone TB-1);
- Unit 2 Turbine Building (Fire Area TB-1);
- Unit 2 West Cable Vault (Fire Area CV-1);
- Unit 1 'A' Charging Pump Cubicle (Fire Area PA-1f);
- Unit 1 'B' Charging Pump Cubicle (Fire Area PA-1g); and
- Unit 1 'C' Charging Pump Cubicle (Fire Area PA-1h).

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 samples)

Internal Flooding Inspection

a. Inspection Scope

The inspectors reviewed flood protection measures for equipment in the Unit 2 Containment during concurrent outage activities involving reactor coolant draindown and reactor vessel head bolt de-tensioning. This review was conducted to evaluate FENOC's protection of the enclosed safety-related systems from internal flooding conditions. The inspectors performed a walkdown of the area, reviewed the UFSAR, related internal flooding evaluations, and other related documents. The inspectors examined the as-found equipment and conditions to ensure that they remained

consistent with those indicated in the design basis documentation, flooding mitigation documents, and risk analysis assumptions. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07 - 1 sample)

a. Inspection Scope

The inspectors reviewed a thermal performance test associated with the Unit 1 'A' charging pump lube oil cooler conducted December 15 - 21, 2006, in accordance with 1BVT-2.30.7, "Charging Pump Lube Oil Cooler [1CH-7A,B, or C] Heat Exchanger Thermal Performance Testing," Rev. 0. The review included an assessment of the testing methodology and verified consistency with Electric Power Research Institute document NP-7552, "Heat Exchanger Performance Monitoring Guidelines," December 1991, and Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment." The inspectors reviewed inspection results, related condition reports and lube oil cooler leak test results against applicable acceptance criteria.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (71111.08P - 4 samples)

a. Inspection Scope

The inspector assessed the inservice inspection (ISI) activities using the criteria specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI. The inspector reviewed documentation and interviewed personnel to verify that the activities were performed in accordance with the ASME requirements. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage.

Because Temporary Instruction 2515/150, Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles (NRC Order EA-03-009), had been previously completed at Beaver Valley Unit 2, the inspector incorporated the upper head penetration examinations as samples for ISI activities.

Temporary Instruction 2515/152, Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC Bulletin 2003-02), had also been previously completed during U2's past

outage. During the current outage, FENOC performed under head visual examinations on the bottom mounted penetrations and did not observe boric acid leakage.

Also, during this outage, FENOC mitigated the pressurizer nozzle welds to prevent primary water stress-corrosion cracking (PWSCC) throughwall cracking in the reactor coolant system (RCS) pressure boundary. Mitigation activities included automatic weld overlays on the surge, spray, safety and relief valve nozzles.

The inspector interviewed staff and reviewed evaluations for defects found during non-destructive examinations (NDE) that were to be left in service. The inspector also reviewed plans for repair of indications not to be left in service. Specifically, the inspector reviewed the pressurizer surge line nozzle weld overlay flaw indication evaluation containing both acceptable and unacceptable flaws and compared the recommendations to the ASME Section XI criteria. For the flaws discovered in the reactor head penetrations, the inspector observed that FENOC performed confirmatory liquid penetrant (LP) examinations to check for surface-breaking flaws and reviewed the LP examination results reports (BOP-PT-06-023/024/025). The inspector also verified that no boric acid leakage had been observed on the upper surface of the reactor head near the specific penetrations of concern.

These specific activities were directly observed by the inspector:

- Manual ultrasonic examinations of the pressurizer surge nozzle weld overlay;
- Automatic welding of the pressurizer safety/relief valve nozzles ; and
- Recordings of the visual examination standard for the upper head base metal visuals and the visual examinations for the base metal surrounding the three penetrations containing flaws (found during ultrasonic testing).

The inspector interviewed the boric acid corrosion control program owner and sampled the photographic database of all examined areas to verify that visual inspections emphasized locations where boric acid leaks can cause degradation of safety significant components. The inspector also reviewed a sample of items on the mode hold list, as well as the procedures being used for visual inspection for evidence of boric acid leakage. The inspector confirmed that sampled condition reports were assigned corrective actions consistent with the requirements of the ASME Code and 10 CFR 50, Appendix B, Criterion XVI. Specifically, the inspector reviewed the following evaluations:

- CR 06-7743/2RHS-E21B 'B' Residual Heat Removal Heat Exchanger;
- CR 06-7109/2RCS SG21B Steam Generator Blowdown Isolation; and
- CR 06-8271/2RCS-44 Loop A Bypass Flow Isolation.

The inspector reviewed nondestructive examinations NDE certifications for inspectors performing the above listed examinations, as well as ASME Welder Maintenance Logs for the contracted staff used to perform the overlay weld activities on the pressurizer and the upper reactor head penetration J-groove weld repairs.

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In addition, the following steam generator tube inspection activities were discussed with onsite personnel:

- Selection of the examination scope;
- Comparison of the size, number and locations of detected flaws from the current outage to the predictions in the operational assessment;
- Probe and equipment qualification; and
- Foreign object search and retrieval (FOSAR)/secondary side inspections.

The inspector confirmed that FENOC performed steam generator testing activities and documented the results in accordance with Electric Power Research Institute (EPRI) guidelines and site procedures.

The inspector also reviewed a sample of condition reports to assess FENOC's effectiveness in problem identification and resolution and determined that they are identifying ISI problems at an appropriate threshold and entering them into the corrective action program. The inspector noted the effective use of industry operating experience during the reactor head upper penetration eddy current examinations, as well as the pressurizer heater coupling visual examinations.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

Resident Inspector Quarterly Review (71111.11Q - 2 samples)

a. Inspection Scope

The inspectors reviewed one sample of a Unit 1 & 2 lesson plan for licensed-operator requalification training, which involved Improved Technical Specification (ITS) implementation and interpretation (BV1/2 ITS Draft, Rev. 5). The inspectors also observed Unit 2 licensed-operator annual requalification examinations conducted on the plant-reference simulator on November 30, 2006. The inspectors evaluated licensed operator performance regarding command and control, implementation of normal, annunciator response, abnormal, and emergency operating procedures, communications, technical specification review and compliance, and emergency plan implementation. The inspectors evaluated the licensee staff training personnel to verify that deficiencies in operator performance were identified, and that conditions adverse to quality were entered into the corrective action program for resolution. The inspectors reviewed simulator physical fidelity to verify that the simulator appropriately modeled the plant control room. The inspectors verified that the training evaluators adequately addressed that the applicable training objectives had been achieved. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

Routine Maintenance Effectiveness Inspection (71111.12Q - 2 samples)

a. Inspection Scope

The inspectors evaluated Maintenance Rule (MR) implementation for the issues listed below. The inspectors evaluated specific attributes, such as MR scoping, characterization of failed structures, systems, and components (SSCs), MR risk characterization of SSCs, SSC performance criteria and goals, and appropriateness of corrective actions. The inspectors verified that the issues were addressed as required by 10 CFR 50.65 and the licensee's program for MR implementation. For the selected SSCs, the inspectors evaluated whether performance was properly dispositioned for MR category (a)(1) and (a)(2) performance monitoring. MR System Basis Documents were also reviewed, as appropriate. Documents reviewed are listed in the Attachment.

- CR 06-06303, "Extent of Condition of CR 06-04920, Motor Pinion Key Failure 2HVC-MOD201D"
- CR 06-05068, "Broken Tubing Found During Work On TCV-1MS-106B3"

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 to ensure compliance with applicable criteria contained in 10 CFR 50.65(a)(4). Documents reviewed during the inspection are listed in the Attachment. The inspectors reviewed the planned or emergent work for the following activities:

- Unit 2 unplanned risk on October 1, 2006, following the identification of scaffolding interference associated with Unit 2 Main Steam Isolation Valves. (Sections 1R15, 4OA7).
- Unit 2 planned shutdown "yellow" risk during reactor vessel head bolt de-tensioning and concurrent reactor coolant system draindown on October 6 and 7, 2006.
- Unit 2 planned "yellow" risk October 16-19, 2006 to perform planned 2R12-related maintenance activities on the 'A' train Emergency Bus, (AE Bus).

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Inspectors reviewed the performance and adequacy of the shutdown risk assessment, including the management of resultant risk, implementation of work controls and preservation of decay heat removal.

- Unit 1 planned “yellow” risk during solid state protection system (SSPS) card change-outs while performing system surveillance testing on November 16, 2006.
- Unit 2 risk and duration due to #10 cylinder fuel injector failure and repair for the #1 emergency diesel generator on November 22, 2006.
- Unit 2 risk on November 30 through December 1, 2006 during ‘A’ quench spray flow indicating switch calibration.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 6 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 determinations of operability were justified, as appropriate. In addition, the inspectors verified that TS limiting conditions for operation (LCO) requirements and UFSAR design basis requirements were properly addressed. Documents reviewed are listed in the Attachment. This inspection activity represents six samples of the following issues:

- The inspectors reviewed the OD documented in CR 06-06553, associated with the licensing basis for Unit 2 steam generator overfill during a steam generator tube rupture event. The inspectors focused on the operability aspects of the main steam piping due to the potential for steam generator overfill and the effects of the introduction of water in the main steam piping, and potential bypass of containment. The inspectors reviewed licensee calculations to verify their conclusions that the stresses caused by the introduction of water into sections of main steam piping were bounded by the existing capability of the system supports and associated stress calculations. The inspectors also reviewed the associated 50.59 evaluation.
- The inspectors reviewed the operability aspects associated with erected scaffolding that potentially interfered with the operation of Unit 2 main steam isolation valves (MSIVs), as detailed in CR 06-7046. The inspectors noted that upon discovery, the MSIVs (“A” and “B”) were declared inoperable, TS 3.0.3 was entered, the impeding portions of the scaffolding were removed, and the MSIVs declared operable upon exiting the applicable TS. The inspectors reviewed the licensee’s reportability determinations, as well as engineering assessments that

concluded only one MSIV would have potentially been prevented from fully closing upon demand. Performance issues associated with this event, but separate from the operability aspects reviewed under this section were determined to be a licensee-identified finding, therefore, the enforcement aspects of this finding is described in section 40A7.

- The inspectors reviewed the operability aspects documented in CR 06-7130, associated with a Unit 1 broken conduit connector for 1VS-F-4A, Supplementary Leak Collection and Release System (SLCRS) fan.
- The inspectors reviewed the OD documented in CRs 06-7444/7644/9399, associated with Unit 1 and Unit 2 motor-operated valve (MOV) motor pinion key failures. The inspectors assessed the adequacy and acceptability of FENOC's conclusion that other selected MOVs were operable. The inspector reviewed system configurations of affected MOV's for system interfacing conflicts.
- The inspectors reviewed the operability aspects of a 10 CFR 21 (Part 21) issue documented in CR 06-7917, associated with a manufacturing problem with Areva-supplied, ASCO hydromotor actuator pumps and pump kits. This affects one Unit 2 control room damper and one Unit 2 EDG damper. The affected dampers were declared inoperable and system interfacing operability conflicts with Unit 1 were assessed. However, a temporary modification (TMOD) was performed to hold the EDG damper open to support swapping electrical trains. The inspectors assessed the adequacy and acceptability of the TMOD to support and maintain EDG operability (section 1R23).
- The inspectors reviewed the operability aspects and extent of condition associated with Unit 2 #2-1 emergency diesel generator (EDG) #10 fuel injector failure discovered during the performance of the monthly surveillance run, 2OST-36.1. The 2-1 EDG fuel injectors had been replaced during the recent 2R12 outage. The failure and preliminary analysis is documented in CR 06-10449 and CR 06-10398.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17).1 Annual Review (71111.17A - 1 sample)a. Inspection Scope

The inspectors evaluated the design basis impact of the modifications listed below. This modification was also needed to support the Unit 2 power uprate. The inspectors reviewed the adequacy of the associated 10 CFR 50.59 screening, verified that attributes and parameters within the design documentation were consistent with required licensing and design bases, as well as credited codes and standards, and walked down the systems to verify that changes described in the package were appropriately implemented. The inspectors also verified the post-modification testing was satisfactorily accomplished to ensure the system and components operated consistent with their intended safety function. Documents reviewed are listed in the Attachment.

- Unit 2 ECP-03-0213, 'A' High Head Safety Injection (HHSI) Pump Rotating Assembly

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 5 samples)a. Inspection Scope

The inspectors reviewed the following activities to determine whether the post-maintenance tests (PMT) adequately demonstrated that the safety-related function of the equipment was satisfied given the scope of the work specified, and that operability of the system was restored. In addition, the inspectors evaluated the applicable acceptance criteria to verify consistency with the associated design and licensing bases, as well as TS requirements. The inspectors also verified that conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment. The following five maintenance activities and associated PMTs were evaluated:

- 2OST-36.1, "Emergency Diesel Generator [2EGS\*EG2-1] Monthly Test" Rev. 48, performed on October 22 following troubleshooting and repairs on emergency diesel generator #2-1 air start distributor and voltage regulator.
- WO 200151306 retest completed on October 18, following repairs to correct high friction (slow closure times) for the Unit 2 'C' main steam isolation valve (2MSS-AOV101C).



- 2MSP-9.4M, "Containment Sump (2DAS-Tk204) Inspection" Rev. 6, performed on November 9 after installation of a new containment sump during 2R12.
- WO 200239958 post-weld inspections on November 13 after repairs associated with 2RCS-272 during outage 2R12.
- WO 200241542 post-installation checks and testing instructions following replacement of #10 fuel injector for the Unit 2 #1 emergency diesel generator on November 22 and 23.

b. Findings

No findings of significance were identified.

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

.1 Unit 2 Refueling Outage (2R12)

a. Inspection Scope

The inspectors observed selected Unit 2 outage activities to determine whether shutdown safety functions (e.g. reactor decay heat removal, spent fuel pool cooling, and containment integrity) were properly maintained as required by TS and plant procedures. The inspectors evaluated specific performance attributes including operator performance, communications, and instrumentation accuracy. The inspectors reviewed procedures and/or observed selected activities associated with the Unit 2 refueling outage. The inspectors verified activities were performed in accordance with procedures and verified required acceptance criteria were met. The inspectors also verified that conditions adverse to quality identified during performance of selected outage activities were identified as required by the licensee's corrective action program. Documents reviewed are listed in the Attachment. The inspectors also evaluated the following activities:

- Pre-Outage Shutdown Safety Review;
- Reactor plant shutdown and cooldown, including evaluation of cooldown rates;
- Initial mode 4, as-found boric acid walkdown inside containment;
- Containment closure contingencies and procedures;
- Reactor coolant system draindown to support refueling operations;
- Refueling operations;
- Spent fuel pool cooling operations;
- Maintenance of decay heat removal flowpaths;
- Coordination of electrical bus work and minimization of shutdown risk;
- High head safety injection full flow test;
- Containment sump installation and inspection;
- Pressurizer weld overlay operations;
- Reactor vessel head inspection and penetration repair;
- Final containment walkdown and closeout inspection;

- Control rod testing;
- Initial criticality;
- Reactor startup;
- Low power reactor physics testing;
- Plant startup and heatup, including evaluation of heatup rates; and
- Reviewed the digital video documenting the core reload and verified the fuel assembly placement was consistent with the reload map.

The inspectors also observed selected management review activities associated with restart readiness of Unit 2, following completion of the 2R12 refueling activities. The restart readiness review meeting was accomplished as required by NOBP-OM-4010, "Restart Readiness for Plant Outages" Rev. 4 on November 8, 2006. The purpose of the review, in part, was to assure to station management that the plant's material condition, programs/processes, and staff members are ready for startup and safe, reliable operation after completion of outage activities.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 6 samples)

a. Inspection Scope

The inspectors observed pre-job test briefings, observed selected test evolutions, and reviewed the following completed Operation Surveillance Test (OST) and Maintenance Surveillance (MSP) packages. The reviews verified that the equipment or systems were being tested as required by TS, the UFSAR, and procedural requirements. Documents reviewed are listed in the Attachment. The following six activities were reviewed:

- 1BVT-1.21.2, "Trevitest Method For Main Steam Safety Valve Setpoint Check," Rev. 12, for SV-1MS-103C during 1POAC2, on August 24, 2006;
- 2BVT1.1.1, "Rod Drop Time Measurement and RPI Verification", Rev. 11;
- 2BVT1.3.1, "Narrow Range RTD Cross Calibration", Rev. 5;
- 2BVT1.47.5, "Type 'C' Leak Test", Rev. 10 for Unit 2 containment isolation valve 2CVS-93;
- 2OST-6.2A, "Computer Generated Reactor Coolant System Water Inventory Balance", Rev.25; and
- 2OST-11.14B, "HHSI Full Flow Test," Rev. 22.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 2 samples)a. Inspection Scope

The inspectors reviewed the following temporary modifications (TM) based on risk significance. The TM and associated 10CFR50.59 screening were reviewed against the system design basis documentation, including the UFSAR and the TS. The inspectors verified the TMs were implemented in accordance with Administrative (ADM) Procedure, 1/2-ADM-2028, "Temporary Modifications," Rev. 6. Documents reviewed are listed in the Attachment.

- TMOD 2-06-06, associated with ventilation exhaust damper 2HVD-MOD21A for the Unit 2 #1 Emergency Diesel Generator (EDG). Inspectors walked down the system to verify that the TMOD described was appropriately implemented, the safety function of the damper would be maintained, and the EDG operability would not be challenged.
- TMOD 2-08-06, associated with the Unit 2 containment sump narrow range level sensor. One element of the sensor string had failed and was subsequently jumpered out. For this activity, the inspectors walked down the area to verify actual system configuration and reviewed modifications to the sensor. The inspector verified that post-modification testing was satisfactorily accomplished.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness [EP]**1EP6 Drill Evaluation (71114.06 - 1 sample)a. Inspection Scope

The inspectors observed a Unit 2 licensed-operator annual simulator evaluation conducted on November 30, 2006. Senior licensed-operator performance regarding event classifications were specifically evaluated. The inspector evaluated the simulator-based scenario that involved multiple equipment failures, and plant conditions that would have warranted emergency plan activation, emergency facility activation, and escalation to the event classification of Alert. The licensee planned to credit 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. 4, "Regulatory Assessment Performance Indicator Guideline." The inspectors reviewed licensee evaluator worksheets regarding the performance indicator acceptability, and reviewed other crew and operator evaluations to ensure adverse conditions were appropriately entered into the Corrective Action Program. Other documents utilized in this inspection include the following:

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- 1/2-ADM-1111, "NRC EPP Performance Indicator Instructions," Rev. 2;
- EPP/I-1B, "Recognition and Classification of Emergency Conditions," Rev. 10;
- 1/2-EPP-I-3, "Alert," Rev. 22;
- 1/2-EPP-I-4, "Site Area Emergency," Rev. 22; and
- 1/2-ADM-1111.F01, Rev. 0, "Emergency Preparedness Performance Indicators Classifications/Notifications/Pars.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope (9 Samples)

During the period October 2 - 6, 2006, 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 the Unit 2 refueling outage. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, relevant TSs, and the licensee's procedures.

Plant Walkdown and RWP Reviews

- During the Unit 2 refueling outage, the inspector identified exposure significant work activities being conducted in the Reactor Building. Specific work activities included removal of insulation and installation of temporary shielding on the reactor vessel head and pressurizer components, i.e. spray line, relief valves, and piping, in preparation for conducting metallurgical inspections and performing weld overlays. Other in-containment activities included scaffolding installation, equipment mobilization, and support activities for modifying the containment sump. The inspector reviewed radiation survey maps and radiation work permits (RWP) associated with these activities to determine if the radiological controls were acceptable.
- The inspector toured accessible radiological controlled areas in the Unit 2 containment and with the assistance of a radiation protection supervisor, the inspector performed independent surveys of selected areas to confirm the accuracy of survey maps and the adequacy of postings.
- In evaluating RWPs, 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 dosimeter alarms or malfunctions for tasks being conducted under selected RWPs. Work reviewed included RWP 206-5048, Pressurizer Weld Overlay (Tasks 1 & 2), RWP 206-5026, reactor vessel external head inspection (Task 1), and RWP 206-5027, reactor vessel under head inspection (Task 1).

- The inspector reviewed selected RWPs and ALARA plans, associated airborne monitoring instrumentation, and engineering controls (e.g., portable ventilation systems) for potential airborne radioactivity areas and contaminated areas in the Unit 2 reactor building to determine if the controls were adequate. Additionally, the inspector reviewed Personnel Contamination Event (PCE) reports for outage and non-outage tasks, potentially resulting in internal exposures, and confirmed that no worker received an internal dose in excess of 50 mrem, for work activities performed at Unit 1 or Unit 2 for 2006 to date.

#### Problem Identification and Resolution

- The inspector reviewed elements of the licensee's corrective action program related to controlling access to radiological controlled areas, 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 aspects of various ongoing activities to confirm 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 various pre-job RWP briefings including pressurizer insulation removal, pressurizer temporary shielding installation, reactor head insulation removal, and reactor vessel under-head inspection preparations.

#### High Risk Significant-LHRA and VHRA Controls

- Keys to locked high radiation areas (LHRA) and very high radiation areas (VHRA) for Unit 2 were inventoried, and accessible LHRAs and VHRAs in the reactor building were verified to be properly posted and secured during Unit 2 plant tours.
- The inspector discussed with radiation protection supervision the adequacy of physical and administrative controls for performing work in high radiation areas, including spent fuel transfers and in-core detector movement. The inspector verified that any changes to relevant procedures did not substantially reduce the effectiveness and level of worker protection and evaluated the adequacy of pre-requisite communications and authorizations.

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### Radiation Worker Performance

- The inspector observed radiation worker and radiation protection technician performance during containment equipment mobilization and preparations made for performing pressurizer weld overlay tasks. The inspector determined that the individuals were aware of current radiological conditions, access controls, and that the skill level of the workers was sufficient with respect to the potential radiological hazards and the task performed. The inspector reviewed condition reports related to radiation worker and radiation protection technician errors, and personnel contamination event reports to determine if an observable pattern traceable to a common cause was evident.

#### b. Findings

No findings of significance were identified.

### 2OS2 ALARA Planning and Controls (71121.02)

#### a. Inspection Scope (5 Samples)

During the period October 2 - 6, 2006, the inspector conducted the following activities to verify that the licensee was properly implementing operational, engineering, and administrative controls to maintain personnel exposure as low as is reasonably achievable (ALARA) for tasks conducted during the Unit 2 refueling outage. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures. The Problem Identification and Resolution (PI&R) sample referenced below is redundant with the PI&R sample contained in paragraph 2OS1 and is not included in the sample count.

#### Radiological Work Planning

The inspector reviewed pertinent information regarding site cumulative exposure history, current exposure trends for 2006, and the dose estimates for the Unit 2 refueling outage to assess current ALARA performance and outage exposure challenges. The inspector determined that the site's 3-year rolling average collective exposure placed the site in the third quartile ranking for U. S. pressurized water reactor power plants.

The inspector reviewed the ALARA Plans to limit exposure for dose intensive tasks scheduled during the Unit 2 outage, including pressurizer weld overlays, reactor building sump modification, scaffolding installation/removal, steam generator eddy current inspection support, and reactor disassembly/reassembly.

The inspector reviewed the 2R12 refueling outage daily dose summary reports, detailing worker estimated and actual exposures, through October 5, 2006, for outage-related tasks.

The inspector evaluated the effectiveness of exposure mitigation requirements specified in RWPs and ALARA Plans, by comparing actual, collective dose received with estimated dose for top-of-pressurizer and surge line weld overlay preparations. The inspector reviewed, in detail, the effectiveness of temporary shielding installations for pressurizer tasks by comparing before and after dose rates for shielding packages 06-063 through 06-071.

The inspector evaluated the departmental interfaces between radiation protection, engineering, operations, maintenance crafts, and contractors to identify missing ALARA program elements and interface communications issues. The evaluation was accomplished by attending a site ALARA committee meeting on 10/05/2006; interviewing the Manager Radiation Protection, the Manager - Pressurizer Weld Overlay Project, the Supervisor - Fleet Performance Monitoring; reviewing recent ALARA committee meeting minutes; and reviewing a Nuclear Quality Assessment field observation report.

The inspector determined if work activity planning included the placement of activated components away from occupied work areas, system flushes to reduce piping source terms, and operational considerations, e.g., filling the steam generators and pressurizer during dose intensive tasks, to further limit dose.

The inspector reviewed personnel contamination event (PCE) reports for selected personnel who became contaminated while performing outage-related tasks, and evaluated the effectiveness of the licensee's methods for controlling loose surface contamination and airborne radioactivity.

#### Verification of Dose Estimates and Exposure Tracking Systems

The inspector reviewed the basis for the annual site, collective exposure estimate for 2006, the actual, collective exposure received to date during normal plant operation and during the recent Unit 1 outage and the Unit 2 outage dose projection.

The inspector reviewed the licensee's methods for re-evaluating exposure estimates and re-planning work when emergent work or expanded job scope was encountered. The inspector attended an ALARA committee meeting held to re-evaluate projected outage dose, based on the most current survey data, following completion of the reactor coolant system clean-up; reviewed recent actions of the committee in monitoring and controlling dose allocations; and interviewed site staff regarding actions to be taken when actual dose approached estimated dose.

The inspector reviewed the licensee's exposure tracking system (HIS-20) to determine whether the level of detail, exposure report timeliness and dissemination was sufficient to support the control of collective exposures. Included in this evaluation were departmental dose compilations, specific RWP dose summaries, and individual exposure records.

#### Job Site Inspection and ALARA Control

The inspector observed activities being performed in support of various outage projects, including installation of temporary shielding on pressurizer components/piping, cutting of containment sump grating, reactor head insulation removal, and scaffolding construction in containment. The inspector attended pre-job ALARA briefings for selected tasks, verified that job coverage and contamination controls were implemented, and that personnel properly wore dosimetry and were knowledgeable of work area radiological conditions.

#### Source Term Reduction and Control

The inspector reviewed the status and historical trends for the Unit 2 source term. Through review of recent survey maps and interviews with the Manager Radiation Protection, the inspector evaluated recent source term measurements and control strategies. Specific strategies being employed at Unit 2 included shutdown chemistry controls, system flushes, use of macro-porous resin, and temporary shielding.

#### Declared Pregnant Workers

The inspector reviewed the procedural controls for managing declared pregnant workers (DPW) and the exposure records associated with a current DPW to determine if the required administrative controls were being implemented.

#### Problem Identification and Resolution

The inspector reviewed elements of the licensee's corrective action program related to implementing the ALARA program to determine if problems were being entered into the program for timely resolution. Condition reports related to dose/dose rate alarms, programmatic dose challenges, and effectiveness in predicting and controlling worker dose were reviewed. Details of this review are contained in Section 4OA2 of this report.

b. Findings

No findings of significance were identified.



2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)a. Inspection Scope (9 Samples)

During the period December 11 - 14, 2006, the inspector conducted the following activities to evaluate the operability and accuracy of radiation monitoring instrumentation and the adequacy of the respiratory protection program for issuing self-contained breathing apparatus (SCBA) to emergency response personnel. Implementation of these programs was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures.

- The inspector reviewed the operating procedures and current source activities/dose rate characterizations for the two (2) Shepherd Model 89-400 calibrators (Nos. 9139 and 9109) and the Shepherd Model 81 panoramic calibrator. The inspector reviewed the calibration records for the RadCal Electrometer 2026C and associated ion chambers used in calibrating the Shepherd calibrators.
- The inspector reviewed the calibration records for selected survey meters, dosimeters, and contamination monitors including portable neutron survey instruments (PNR-4), small article monitors (SAM-11), portal contamination monitors (SPM-906), portable ion chambers (RO-2 & RO-20), electronic dosimeters (DMC-2000), hand-held contamination friskers (RM-14), and whole body counting systems (FastScan and AccuScan II).
- The inspector observed a technician performing a calibration of a portable ion chamber (RO-2, Serial No. 6266) and confirmed that procedural requirements were met. The inspector also observed a technician perform daily functional checks on personnel contamination monitors located at the control point (SPM-906, Serial Nos. 030, 104, 026).
- The inspector reviewed current calibration data for selected area monitors located in the Unit 1 decontamination building (RM-RM-205), Unit 1 auxiliary building (RM-RM-209), Unit 1 sample room (RM-RM-212), Unit 1 drum handling area (RM-RM-208), and various Unit 2 auxiliary building monitors (2RMP-DAU-206/207/208).
- The inspector reviewed Part 61 contamination sampling results for Unit 1 and Unit 2 to determine if the calibration sources were representative of the radioisotopes found in the plant source term. Whole body counting system records were reviewed to determine if Part 61 data was addressed to ensure that hard-to-detect radioisotopes were given proper dosimetric consideration.
- The inspector reviewed electronic dose and dose rate alarm reports for 2006, to date, and compared actual dose/dose rates to programmed set points to determine if the dosimeter appropriately responded to the radiation field experienced.

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### Respiratory Protection Program

The inspector evaluated the adequacy of the respiratory protection program regarding the maintenance and issuance of self-contained breathing apparatus (SCBA) to emergency response personnel.

- Training and qualification records were reviewed for all control room operators from the operating shifts at each unit and for selected radiation protection technicians who would wear SCBAs in the event of an emergency.
- The inspector, with the assistance of a respiratory protection technician, functionally tested and inspected six (6) SCBAs, staged for use in the Unit 2 auxiliary fire brigade room.
- The inspector verified that the appropriate number of SCBAs were staged, and had been inspected weekly, in various plant areas, including the Unit 1 fire brigade room; controlled area hallway; water treatment building; and radiation technician shift area, and the Unit 2 fire van; controlled building equipment room; and pump house. The inspector confirmed that eyeglass inserts for licensed operators were readily available for use in the control room. Maintenance and test records were reviewed for selected SCBAs. The sample results for breathing air, used to refill the SCBA tanks, were reviewed to confirm that air quality met CGA-G-7.1-1997 Grade D standards.

#### b. Findings

No findings of significance were identified.

### **4. OTHER ACTIVITIES [OA]**

#### 4OA1 Performance Indicator (PI) Verification (71151 - 4 samples)

##### a. Inspection Scope

##### Cornerstone: Mitigating Systems (2 samples)

The inspectors sampled FENOC submittals for the one PI listed below for Unit 1 and Unit 2. The inspectors reviewed data from fourth quarter 2004 through the third quarter 2006. To verify the accuracy of the PI data reported during these periods, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 4, were used to verify the reporting basis for each data element.

- Safety System Functional Failure

The inspectors reviewed portions of the operations logs and raw PI data developed from monthly operating reports and discussed the methods for compiling and reporting the

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PIs with cognizant licensing and engineering personnel. The inspectors compared graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report. Documents reviewed during this inspection are listed in the Attachment.

Cornerstone: Occupational Exposure Radiation Safety (1 sample)

- Occupational Exposure Control Effectiveness

The inspector reviewed implementation of the licensee's Occupational Exposure Control Effectiveness Performance Indicator (PI) Program. Specifically, the inspector reviewed condition reports, and associated documents, for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 4, to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators. This review covered the period from October 1, 2005 through September 30, 2006.

Cornerstone: Public Radiation Safety (1 sample)

- RETS/ODCM Radiological Effluent Occurrences

The inspector reviewed relevant effluent release reports for the period October 1, 2005 through September 30, 2006, for issues related to the public radiation safety performance indicator. This indicator measures radiological effluent release occurrences that exceed 1.5 mrem/qtr whole body or 5.0 mrem/qtr organ dose for liquid effluents; 5 mrad/qtr gamma air dose, 10 mrad/qtr beta air dose, and 7.5 mrad/qtr for organ dose for gaseous effluents.

The inspector reviewed the following documents to ensure the licensee met all requirements of the performance indicator:

- monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases; and
- dose assessment procedures.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (PI&R) (71152 - 3 samples)

.1 Daily Review of Problem Identification and Resolution

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 followup, the inspectors performed a daily screening of items entered into FENOC's corrective action program. This review was accomplished by reviewing summary lists of each condition report (CR), attending screening meetings, and accessing FENOC's computerized CR database.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Trend Review (1 sample)

a. Inspection Scope

The inspectors reviewed site trending results for January through June, 2006, to determine if trending was appropriately performed and evaluated by FENOC. This review covered the site trending program under FENOCs Integrated Performance Assessment process, and included a sample of self-assessments from the several organizations at Beaver Valley. This review verifies that existing trends were (1) appropriately captured and scoped by applicable departments, (2) consistent with the inspectors' assessment from the daily CR and inspection module reviews (Section 40A2.1, .4 through .6), and (3) not indicative of a more significant safety concern. Additionally, the inspectors verified the performance of site trending against NOP-LP-2001, Rev. 13, "Condition Report Process," and NOBP-LP-2018, Rev. 01, "Integrated Performance Assessment /Trending." The inspectors also reviewed quarterly Quality Assurance reports and issues captured in the Activity Tracking database to identify issues and trends to evaluate during the inspection.

b. Findings

No findings of significance were identified. However, an adverse trend that involved scaffolding program implementation was evident from previous integrated performance assessments (IPA) as well as a review of CRs over the course of the assessment period and beyond (See IPA BV-SA-06-005, and CR05-08203). Plant processes such as IPAs, the corrective action program, management review of CRs (daily, following management meeting), internal and external Operating Experience, are all available and could have been used to identify this trend involving the implementation of the scaffolding program. The inspector did note, however, that during the current inspection report period, a fleet-wide self-assessment was performed to evaluate the health of the site scaffolding program, and the benefits of this assessment, e.g., evaluation of corrective actions, were not part of this trend review.

.3 Annual Sample Review (2 samples)

Repetitive Leaks in Fire Water, River Water, and Service Water System Piping

a. Inspection Scope

The inspectors reviewed FENOC's actions in response to repetitive minor leaks in three systems: the Fire Protection system, Unit 1 safety-related River Water system, and Unit 2 safety-related Service Water system. These three water systems are all supplied directly by the Ohio River, and have experienced repetitive minor leaks due to microbiologically influenced corrosion (MIC). The inspectors reviewed FENOC's identification of these problems; the related evaluations and operability determinations; the extent-of-condition review; the corrective actions specified; and their prioritization. The inspectors walked down accessible portions of the systems and interviewed applicable system engineers.

b. Findings

No findings of significance were identified. However, while FENOC has identified and characterized the MIC problem, has taken steps to reduce the rate of MIC, and uses samples to monitor the corrosion rate, the problem itself remains for large bore piping. (Small bore piping has been replaced using material highly resistant to MIC.) The consequences identified in this inspection have not resulted in loss of system safety functions.

Review of The Operator Workaround Program

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator work-arounds, the list of operator burdens, existing operator aids and disabled alarms, and the list of open main control room deficiencies. This review was performed to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel were identifying, assessing, and reviewing OWAs as specified in administrative procedure BVBP-OPS-0002, "Operator Work-Arounds, Operator Burdens, and Control Room Deficiencies" Rev. 11.

The inspector reviewed FENOC's process to identify, prioritize and resolve Main Control Room Distractions to minimize operator burden. The inspector reviewed the system used to track these operator work-arounds and burdens and recent licensee self assessments of the program. The inspector toured the control room, and discussed the following items with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance:

- Burden 200228554 and 200338555, "Stuck open check valve 1DG-P-2A and 2B." Impact on results of RCS Inventory Balance Surveillance.
- Burden 2001157437, "QS-P-1A high vibrations." Impact is increased monitoring requirements for operators.

- Burden 200223265, "Test Operator for MOV-1RH-605." Impact is increased monitoring and possible need for manual operations. Condition not present during troubleshooting efforts.
- Burden 200233635, "Fire Detector in Unit 2 West Cable Vault not communicating with XL3." Impact is additional monitoring until problem is identified and corrected.

b. Findings and Assessment

No findings of significance were identified. At the time of the inspection, FENOC currently has no issues classified as operator work-arounds and relatively few operator burdens. These operator burdens were determined to have a minimal impact on the ability of the operator to promptly and appropriately respond to an event. The operators interviewed were aware of the status of the active operator burdens for their unit.

The tracking system in place (SAP) appeared to be effective at ensuring operators and management were aware of operator work-arounds and burdens and ensuring these items were addressed in a timely fashion. The inspector also found that the recommendations of the Self Assessment conducted in July 2005 had been implemented into the latest program revision.

.4 Power Uprate Inspection Module PI&R Review (1 sample)

a. Inspection Scope

The inspector reviewed a sample of condition reports and resulting corrective actions relating to the erosion-corrosion/flow-accelerated-corrosion (EC/FAC) program which identified EC/FAC conditions discovered during the current operating cycle. The inspector verified that the conditions and other deficiencies identified were reported, characterized, evaluated and appropriately dispositioned and entered into the corrective action program.

b. Findings

No findings of significance were identified.

.5 Access Controls and ALARA Planning and Controls (1 sample)

a. Inspection Scope

The inspector reviewed twenty-six (26) Condition Reports, a Nuclear Oversight Field Observation report, and recent site ALARA committee meeting minutes to evaluate the threshold for identifying, evaluating, and resolving problems in implementing radiological controls. This review was conducted against the criteria contained in 10 CFR 20, TSs, and the licensee's procedures.

b. Findings

No findings of significance were identified.

.6 Radiation Monitoring Instrumentation and Protective Equipment

The inspector reviewed selected Condition Reports (CR), Nuclear Quality Assessment Quarterly reports, and field observation reports to evaluate the licensee's threshold for identifying, evaluating, and resolving problems in implementing the radiation monitoring instrumentation and respiratory protection programs. Included in this review were CR's related to radiation worker and radiation protection technician errors to determine if an observation traceable to a common cause was evident. This review was conducted against the criteria contained in 10 CFR 20, Technical Specifications, and the licensee's procedures.

b. Findings

No findings of significance were identified.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 Unit 2 Loss of 'A' Train Feedwater Heating on November 17

On November 17, Unit 2 was at 97 percent power. At 0256 hours, planned actions were being taken to return the 'A' 4<sup>th</sup> point feedwater heater to service. It became apparent to the control room operators, due to numerous feedwater heater alarms and lowering reactor coolant temperature, that a feedwater heater level transient was occurring. The level transient caused extraction steam (ie, feedwater heating) to isolate for the entire 'A' train feedwater heaters and two of six 'B' feedwater heaters. Operators took immediate action to manually reduce main turbine load and commenced borating the reactor in accordance with Abnormal Operating Procedure 51.1, "Emergency Shutdown", Rev. 11. Lowering reactor coolant temperature caused a reactivity excursion and resulted in a momentary reactor power increase (102 percent peak for 1 second as calculated from delta temperature). Operators stabilized reactor power at 37 percent power, consistent and conservative with limitations established for no feedwater heating (40 percent power limit). The inspectors reviewed applicable operating and alarm response procedures, technical specifications, plant process computer indications, and control room shift logs to evaluate the adequacy of FENOC's response to these events. Appropriate TS limiting conditions for operation (LCOs) were entered. The inspectors also verified the events were entered into the corrective action program to resolve identified adverse conditions.

.2 Unit 2 Main Turbine Governor Valve Calibration on November 29

On November 29, the inspector observed portions of the licensee's implementation of new partial arc curves for the main turbine governor valves GV1 and GV4. This activity was performed under work order 200241441, and briefed as an infrequently performed test or evolution (IPTE). This activity involved input of new programming curves into the turbine governor control system. The inspector verified this IPTE had appropriate

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personnel involved with the test, appropriate termination criteria, communications, and supervision, including adequate controls in place to ensure appropriate implementation. The inspector verified that the governor valves responded as expected and desired upon system restoration, and no significant issues were identified by the inspector.

.3 Unit 1 Loss of Safety Parameter Display System (SPDS) displays in Control Room on December 3-5

On December 3, the Shift Technical Advisor (STA) identified that the Unit 1 SPDS displays (there are two displays for Unit 1) were not receiving sensible data. The SPDS displays readily assessable information for emergency preparedness. The system was successfully rebooted according to procedure 1OM-5C.4.A, yet the SPDS failed to indicate properly. It was subsequently determined that a hardware failure existed with a projected outage time of two days. CR 06-10848 and Notification 600350762 documented the condition. The STA and control room operators verified that redundant information was available via the main control boards and plant process computer. NUREG-1022, Rev. 2 was reviewed for reportability guidance. Due to the outage duration, the licensee conservatively determined this failure to be a loss of emergency preparedness capability pursuant to 10 CFR 50.72(b)(3)(xiii) and reported as Event Notification #43030.

.4 (Closed) Licensee Event Report (LER) 05000344/2006-002-00: Unit Shutdown Completed as Required by Plant Technical Specification for Failed Solid State Protection System Memory Card.

On May 26, 2006, Beaver Valley Power Station (BVPS) Unit 1 identified a failure of a universal logic card during performance of 1MSP-1.05-I, Solid State Protection System (SSPS) Train 'B' Bi-Monthly Test. The surveillance test indicated unsatisfactory results while performing the Memories Function Test. Technical Specifications required a plant shutdown to Mode 3. The Unit was placed in Mode 3 as required. The failure would not have prevented the SSPS from performing its safety function. The failed SSPS card was replaced and all post-maintenance testing was completed satisfactory. The root cause of this failure was indeterminate, but most probably determined to be a poor connection in the SSPS testing circuit which affected pin #4 of Universal Logic card A412. Corrective actions included replacing the failed card, post mortem testing by FENOC's Beta Labs and Westinghouse, visual inspections of the card rack connector for damage, and submittal of an operating experience report to the industry. The inspectors reviewed this LER and no findings were identified. The licensee has documented this event in their corrective action program under CR 06-6090. This LER is closed.

.5 (Closed) LER 05000344/2006-003-00: Inadvertent Technical Specification Non-Compliance Due To Inoperable Containment Isolation Valve.

On July 22, 2006, Beaver Valley Power Station (BVPS) Unit 1 initiated a work activity to replace a manual isolation valve in the pressurizer liquid sample line outside of containment. The clearance intended to close and de-energize the outside containment



isolation valve (TV-1SS-100A2), which is normally open, fail closed, air operated valve. The clearance activity isolated the air supply to the valve at approximately 1315 hours, however, the clearance did not provide adequate instructions to bleed off trapped air in the valve actuator. As a result, the valve remained open and could not have been closed remotely. At approximately 2310 hours, an oncoming Reactor Operator identified that TV-1SS-100A2 was indicating open with a clearance tag posted on it. The valve was placed in the closed position at 2351 hours.

This resulted in FENOC not being in compliance with Technical Specification Action Statement (TSAS) 3.6.3.1 for an inoperable containment isolation valve. The TSAS requires, in part, that the affected penetration flow path to be isolated by the use of either one closed and deactivated automatic valve, closed manual valve, blind flange or check valve with flow through the valve secured, otherwise be in at least Hot Standby within the following 6 hours and in Cold Shutdown within the following 30 hours. FENOC did not comply with this requirement because TV-1SS-100A2 was not closed and de-energized for approximately 10.6 hours. The cause of the event was determined to be Human Performance errors which occurred in the development of the work package (Inattention to Detail) and during the clearance posting (Self Checks and Peer Checks). Corrective actions included immediately closing and de-energizing TV-1SS-100A2 to restore TS compliance, reviewing this event with all FENOC Operations Department personnel, and the development of a repetitive administrative task to require Operations Supervision/Management to perform field observations that focus on the use of human performance tools during clearance activities. The LER was reviewed by the inspectors and no new findings were identified. This finding constitutes a violation of NRC Requirements. The enforcement aspects of this finding are discussed in section 40A7 of this report. This LER is closed.

- .6 (Closed) LER 05000344/2006-004-00: Reactor Trip Due to a Failed Universal logic Board in Solid State Protection System.

On September 07, 2006, Beaver Valley Power Station (BVPS) Unit 1 experienced an unexpected reactor trip at 2157 due to the opening of the "B" Reactor Trip Breaker. This was determined to have been caused by the failure of universal logic card A312B output gate in the Solid State Protection System (SSPS). This failure produced an invalid SSPS trip signal to trip the breaker. The root cause of this failure was a manufacturing defect on the integrated circuit card Z9 that was not identified by pre/post manufacturer testing. The licensee conducted a detailed root cause analysis, and along with Westinghouse, investigated the generic implications of this failure. Corrective actions included replacing the failed card, post-failure testing by FENOC's Beta Labs and Westinghouse, and development of a SSPS board replacement strategy. The inspectors reviewed this LER and no findings were identified. The licensee has documented this event in their corrective action program under CR 06-6090. This LER is closed.

- .7 (Closed) LER 05000344/2006-005-00: Failure to Comply with Technical Specification to De-Energize Safety Injection Flow Path Valves.

On September 8, 2006, an Operations Supervisor discovered a discrepancy between the plant shutdown procedure and the TS Basis for 3.5.4. This discrepancy had resulted in two Emergency Core Cooling System (ECCS) High Head Safety Injection (HHSI) Valves not being isolated as required by TS 3.5.4, from August 25 to August 29, 2006, while the plant was in Modes 4, 5, or 6. The TS Bases state for an HHSI valve to be isolated it shall be closed and de-energized. The shutdown procedure had been recently revised and incorrectly removed the instructions to de-energize the HHSI valves. The procedure was revised after approval of the 2005 Extended Power Uprate (EPU) License Amendment Request which was granted in July 2006.

The HHSI valves are required to be isolated to prevent a potential unanalyzed cold overpressure condition which could be caused by an inadvertent safety injection (SI) event. With the HHSI flow valves being closed, but not de-energized, they would still open upon receipt of an SI signal. The risk significance of the event was considered to be low because automatic SI signals were blocked, 2 of 3 HHSI pumps were made inoperable, and 2 power-operated relief valves (PORVs) were available during the majority of the exposure period. This line up is bounded by the current low temperature over-pressure design basis analysis. Corrective Actions included revising the incorrect procedures, training in Improved Standard Technical Specifications and Basis information, and an independent SRO review of TS compliance for all procedure changes made or being planned from the EPU. The LER was reviewed by the inspectors and no new findings were identified. This finding constitutes a violation of NRC Requirements. The enforcement aspects of this finding are discussed in section 40A7 of this report. The licensee has documented this event in their corrective action program under CR 06-6114. This LER is closed.

#### 4OA5 Other Activities

##### .1 Power Uprate, Inspection Procedure 71004

###### Unit 2 Power Uprate and 3-percent Power Ascension

###### a. Inspection Scope

The inspectors observed selected plant testing and other power ascension activities during the implementation of the 3% phase (2689MWt to 2770 MWt) of a planned 3-phase extended power uprate totaling approximately 8% power. Inspectors observed and/or reviewed selected plant changes and testing prior to the power ascension that began on November 19, 2006. The inspectors observed control room and in-plant activities during the ascension to the new 100% power level, and walked down plant systems to ensure adverse conditions were both identified, and if warranted, entered into the corrective action program for resolution.

The inspectors also reviewed operator actions, applicable procedure changes, and reviewed selected plant design changes and other inspection activities conducted under the normal baseline inspection program, to ensure an adequate sample of risk-significant attributes required by the governing procedure were evaluated. This included changes to plant emergency operating procedures, as well as associated operator briefings and training to address those actions resulting from a revised steam generator tube rupture analysis. Specific inspections already completed and credited in past NRC inspection reports, as well as those credited in the current report can be found in the Attachment.

###### b. Findings

No findings of significance were identified.

###### Erosion-Corrosion and Flow-Accelerated Corrosion (EC/FAC)

###### a. Inspection Scope

The objectives of this inspection were to determine whether licensee activities relative to erosion-corrosion/flow-accelerated-corrosion (EC/FAC) monitoring and maintenance were being accomplished in accordance with 10 CFR 50.65, the Maintenance Rule, licensee commitments to implement Generic Letter 89-08, "Erosion/Corrosion Induced Pipe Wall Thinning," and licensee approved procedures. The inspector reviewed the EC/FAC program to determine whether Beaver Valley has taken required action to detect adverse effects (wall thinning) on systems and components as a result of operational changes related to Extended Power Uprate (EPU), such as increased flow in primary or secondary systems, including their interfacing systems. The inspector noted through documentation review that responsibility for the implementation of the FENOC EC/FAC program is delegated by controlled procedure to the Nuclear Engineering Services organization. The Assigned Erosion/Corrosion engineer has overall

responsibilities concerning erosion/corrosion activities and is delegated responsibility for the overall program effort.

The inspector reviewed implementation of a long term EC/FAC monitoring program to determine whether it was consistent with GL 89-08 and the guidelines in Electric Power Research Institute (EPRI) Report NSAC-202L-R2. Also, the inspector reviewed procedures and administrative controls to determine whether those procedures and controls ensure the structural integrity of high energy (single phase and two phase) carbon steel systems. The inspector reviewed the established EC/FAC program to determine whether the degradation of piping and components is described in the procedures, and the examination activities are managed, maintained and documented.

The inspector reviewed the program to determine whether it was well defined and included systematic methods for predicting which systems and specific locations within those systems are susceptible to EC/FAC. In particular, the inspector reviewed those steps taken to identify specific locations that were most likely to be adversely affected by a change (increase) in operating variables (temperature, flow) as a result of increased power levels. Also, the inspector reviewed the licensee EC/FAC activity to determine status and effective utilization of the industry sponsored predictive program (CHECKWORKS) to verify the selection of the most susceptible locations for inspection and additional locations based on unique operating conditions and industry experience. The inspector noted the inspection results are compared to the locations predicted as most susceptible to high wear to verify the program predictive accuracy. The inspector reviewed a portion of the inspection data and analysis of the most susceptible piping components to determine whether the results were clearly documented. Also, the inspector reviewed how inspection data was trended to determine EC/FAC wear rates and identify the future inspection locations. The inspector reviewed condition reports which identified wall thinning in piping during the current outage which was replaced based on predictive analysis of remaining life.

The inspector performed a documentation review to determine if examination activities were performed in accordance with the ASME Boiler and Pressure Vessel Code requirements. The inspector reviewed the EC/FAC program to determine whether it contained specific guidance for actions, such as additional inspection (extent of condition), engineering evaluation and repair or replacement of those components when wall thinning is detected. The inspector reviewed the inspection procedures to determine whether repair or replacement of components determined or predicted to wear below minimum wall thickness requirements was to be performed in accordance with the ASME Section XI program or the original design code requirements. Additionally, the licensee's method of performing ultrasonic testing (UT) of carbon steel for material thickness measurement was reviewed and found to be described in site approved procedures. Personnel conducting the non-destructive examinations were documented as qualified to perform wall thickness measurements.

The inspector selected portions of the feedwater heater vents and drains and the extraction steam systems for a detailed review of the licensee's EC/FAC monitoring activities and effectiveness. The sample selection was based on the inspection

procedure objectives and risk priority of those components and systems where accelerated wear rates were predicted to cause wall thinning. The inspector performed a “walkdown” of portions of the selected systems (piping and components) to verify the as-built configuration matched the plant specific EC/FAC program isometric drawings. The inspector reviewed five EC/FAC program component isometrics and fifteen specific locations within the selected systems, which had been predicted to be susceptible to wear during the initial EC/FAC program evaluations using the CHECKWORKS predictive model. The inspector also reviewed selected locations in these systems that had been identified as susceptible to a projected increase in EC/FAC wear rates using the higher EPU operational variables with the CHECKWORKS model. The inspector determined that the potential increase in wear rates was recognized and these locations were incorporated into the program data base for future inspection sample selection.

The inspector reviewed the specified acceptance criteria for required wall thickness to determine that sufficient margin above the applicable code limits was provided to permit an evaluation and determination of appropriate corrective actions.

b. Findings

No findings of significance were identified.

.2 Temporary Instruction (TI) 2515/166 - Pressurized Water Reactor Containment Sump Blockage

a. Inspection Scope

The inspectors performed the inspection in accordance with Temporary Instruction (TI) 2515/166. The TI was developed to support the NRC review of licensee activities in response to NRC Generic Letter (GL) 2004-02, “Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors (PWR).” Specifically, the inspectors verified implementation of the modifications and procedure changes committed to in the GL response. The inspectors reviewed a sample of the licensing and design documents to verify that they were either updated or in the process of being updated to reflect the modifications. A sample of material specifications, testing and surveillance procedures, and calculations were reviewed to verify that they were updated to reflect the effects of the modification, and the new requirements for the containment sumps and debris generation sources. The inspectors performed a walkdown of the strainer installation to verify it was performed in accordance with the approved design change package. Finally, the inspectors verified that there were no choke-points that could prevent water from reaching the recirculation sump during a design basis accident.

b. Evaluation of Inspection Requirements

The TI requested the inspectors to evaluate and answer the following questions:

1. Did the licensee implement the plant modifications and procedure changes committed to in their GL 2004-02 response?

The inspectors verified that actions implemented by the licensee as described in response to Generic Letter 2004-02 were partially complete as it related to the installation of the sump screen and the potential for clogging of downstream component due to debris bypass. FENOC installed a significantly larger strainer with an integral temporary strainer, which satisfies the current design basis. FENOC will modify the recirculation spray system (RSS) pump start signal and replace two high pressure safety injection (HPSI) throttle valves during the next refueling outage to complete the actions identified in their GL response. The inspectors found that procedures to programmatically control potential debris generation sources were updated.

2. Has the licensee updated its licensing basis to reflect the corrective actions taken in response to GL 2004-02?

The inspectors verified that the interim changes to the facility, as described in the UFSAR and identified in the licensee's GL 2004-02 response, were reviewed and documented in accordance with 10 CFR 50.59. FENOC intends to submit a license amendment in March 2007 to address the changes to RSS.

The TI will remain open to allow for the review of portions of the GL response that have not been completed. Specifically, FENOC has not completed the modification of the high pressure safety injection throttle valves and has not implemented the revised recirculation spray system pump start signal setpoint. Therefore, the inspection will be considered partially complete until the final modifications are reviewed. FENOC has an approved extension to complete these items during their next refueling outage in the Spring of 2008.

c. Findings

No findings of significance were identified.

.3 Temporary Instruction (TI) - 2515/169, Mitigating System Performance Index Verification

a. Inspection Scope

The objective of TI 2515/169 was to verify that the licensee had correctly implemented the Mitigating Systems Performance Index (MSPI) guidance for voluntarily reporting unavailability and unreliability of the monitored safety systems. On a sampling basis, the inspector validated the accuracy of the unavailability and unreliability input data used for both the 12-quarter period of baseline performance and for the first reported results

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(second calendar quarter 2006). Specific attributes examined by the inspectors for this TI included: surveillance activities which, when performed, do not render the train unavailable for greater than 15 minutes; surveillance activities which, when performed, do not render the train unavailable due to credit for prompt operator recovery actions; and for each MSPI system, on a sampling basis, the inspectors independently confirmed the accuracy of baseline planned unavailability, actual planned and unplanned unavailability, and the accuracy of the failure data (demand, run, and load, as appropriate) for the monitored components.

During portions of this inspection, the inspector was accompanied by an observer from the State of Ohio Emergency Management Agency.

b. Findings and Observations

No findings of significance were identified. In accordance with the reporting requirements of TI 2515/169, the following are the results of five areas specifically reviewed by the inspector to verify the accuracy of FENOC's MSPI data for Beaver Valley Unit 1 and Unit 2:

- (1) The inspector reviewed calculations of baseline planned unavailability hours to ensure that FENOC correctly determined baseline data for the MSPI indices and properly translated the data to the consolidated data entry (CDE) input sheet and electronic entry. The inspector noted that the licensee utilized correct critical hour data and was consistent with the value independently calculated by the inspector.

The inspector also reviewed MSPI monitoring of the cooling water systems (river water and service water) to determine if FENOC correctly accounted for planned and unplanned unavailability resulting from cascading support system inoperability. The inspector did not identify any significant issues in this area.

- (2) The inspector reviewed multiple documents, including main control room logs, condition reports, notifications, work orders, and completed surveillance tests to verify the accuracy and completeness of the reported actual unavailability data for the MSPI systems. The inspector did not identify any significant errors in this data.
- (3) The inspector reviewed a sample of Beaver Valley's unreliability data to confirm that FENOC accurately classified valve and breaker demand failures, emergency diesel generator failures to start, load, or run, and pump demand failures and failures to run. The inspector did not identify any errors in the reported unreliability data.
- (4) The inspector reviewed the reported MSPI data to verify that the data was accurate. The inspector did not identify any significant errors which would have resulted in a change to the indicated index colors.

- (5) The inspector reviewed Beaver Valley Unit 1 & Unit 2 MSPI basis documents and associated appendices. The inspector did not identify any significant errors that would result in a change to MSPI system boundaries, an addition of a monitored component, or a change in the reported index color.

#### 4OA6 Management Meetings

##### .1 Access Control / ALARA Planning and Control

The inspector presented the inspection results of Sections 2OS1 and 2OS2 to Mr. Richard Mende, former Director of Site Operations, and other members of FENOC staff, at the conclusion of the inspection on October 6, 2006. The licensee acknowledged the conclusions and observations presented. No proprietary information is presented in this report.

##### .2 Inservice Inspection

The inspector presented the inspection results of Section 1R08 to Mr. James Lash, Site Vice President, and other members of FENOC staff, at the conclusion of the inspection on October 26, 2006. The licensee acknowledged the conclusions and observations presented. No proprietary information is presented in this report.

##### .3 Radiation Monitoring Instrumentation and Protective Equipment

The inspector presented the inspection results of Section 2OS3 to Mr. Peter Sena, former Director of Design Engineering, and other members of FENOC staff, at the conclusion of the inspection on December 14, 2006. The licensee acknowledged the conclusions and observations presented. No proprietary information is presented in this report.

##### .4 Quarterly Inspection Report Exit

On January 18, 2007, the inspectors presented the normal baseline inspection results to Mr. Peter Sena, newly appointed Director of Site Operations, and other members of the licensee staff. The licensee acknowledged the conclusions and observations presented. The inspectors confirmed that proprietary information was not retained at the conclusion of the inspection period.



#### 4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a non-cited violations (NCVs).

- 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires in part, that conditions adverse to quality be promptly identified and corrected. Contrary to the above, on October 1, 2006, the licensee identified that scaffolding had been constructed around the Unit 2 "A" and "B" main steam isolation valves (MSIVs) over a two day period, September 29 and 30, 2006, that potentially would have prevented the MSIVs from fully closing, when needed and required during accident conditions.

The licensee subsequently removed the obstructing portions of the scaffolding, entered and exited the appropriate technical specifications, as required, and restored the operability of the MSIVs. This finding is more than minor, because if left uncorrected, a delay in prompt identification of an adverse condition such as this scaffolding interference with safety-significant MSIVs, would have led to a more significant safety concern. This issue was entered into the corrective action program as condition report CR-06-7046, "Scaffold Interference With Operation Of 2MSS-AOV101A And 2MSS-AOV101B." This finding was determined to be of very low safety significance (Green), based on the risk significance results from a Phase 3 risk analysis, and compromised the Mitigating Systems cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. This analysis was performed using the Beaver Valley Unit 2 Standardized Plant Analysis Risk (SPAR) model, Rev. 3.31, and SAPHIRE version 7.26, dated October 18, 2005.

- Technical Specification 3.6.3.1 states, in part, for an inoperable containment isolation valve, the affected penetration flow path shall be isolated by the use of one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured, otherwise be in at least Hot Standby within the following 6 hours and in Cold Shutdown within the following 30 hours. Contrary to the above, on July 22, 2006, BVPS did not comply with this requirement because TV-1SS-100A2 was not closed and de-energized for approximately 10.6 hours while TV-1SS-100A2, an automatic containment isolation valve, was inoperable. This finding is more than minor because it affects the configuration control attribute of the associated Barrier Integrity Cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding screens to very low safety significance (Green) using IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings at Power," because the finding did not represent an actual open pathway in containment. This finding was identified by the licensee, entered into their

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corrective action program as CR 06-04438 and the required reports were made to the NRC.

- Technical Specification 3.5.4.1.2 states, in part, when cold leg temperature is less than 350F, the boron injection tank flow path shall be isolated and power removed from the inlet and outlet valves. Contrary to the above, from 10:35 a.m. on August 25, 2006 until 2:31 am on August 29, 2006, BVPS did not comply with this requirement because two HHSI valves were closed but not de-energized. This finding is more than minor because it affects the configuration control attribute of the associated Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding screens to very low safety significance (Green) using IMC 0609, Appendix G, "Shutdown Operation Significance Determination Process." This finding was identified by the licensee, entered into their corrective action program as CR 16-6114 and the required reports were made to the NRC.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Licensee personnel

G. Alberti	Steam Generator Program Owner
S. Baker	Site, Radiation Protection Manager
R. Bologna	Operations Manager
R. Boyle	System Engineer
G. Cacciani	Staff Nuclear Engineer
D. Canan	Supervisor, Respiratory Protection
J. Clark	Radiation Protection Health Services Technician
G. Davie	Manager, Training
J. Fontaine	Supervisor, ALARA
K. Frederick	Senior Consultant
L. Freeland	Director Performance Improvement
J. Freund	Supervisor, Rad Operations Support
D. Grabski	ISI Coordinator
R. Hansen	Manager, Nuclear Oversight
T. HeimeI	NDE Level III
C. Hrelec	Senior Radiation Protection Technician
D. Jones	IST Program Engineer
H. Kahl	Design Engineering
K. Kimmerle	Supervisor, Portable Instruments
T. Kelosky	Production Supervisor
J. Lash	Site Vice President
J. Lebda	Radiation Protection Services Supervisor
E. Loehlein	Alloy 600 Program Owner
A. Lonnett	Administrator, RETS/REMP program
J. Lutz	Unit 2 Supervisor
M. Manoleras	Design Manager
J. Mauck	Compliance Engineer
R. Mende	Director, Site Operations
J. Meyers	System Engineer
T. Mahoney	Senior Radiation Protection Technician
C. Miller	Senior Radiation Protection Technician
L. Miller	Fire Protection Engineer / Marshall
J. Miller	Fire Protection Engineer / Marshall
R. Moore	Radiation Protection Supervisor
R. Moore	EPIX Data Processor, FENOC
R. Pattison	Senior Radiation Protection Technician
R. Pucci	Senior Nuclear Specialist, ALARA Coordinator
A. Ryan	Production Manager
R. Sacchet	Radiological Analyst, Emergency Management Agency (Ohio)
P. Sena	Director Engineering

B. Sepelak	Supervisor, Regulatory Compliance
J. Sipp	Manager, Chemistry
R. Snowden	Electrical Maintenance Supervisor
T. Sockaci	Design Engineer
B. Sommers	Operations Surveillance Manager
H. Szklinski	Nuclear Quality Assessor
K. Tiefenthal	Unit 2 Shift Manager
P. Vakhara	Systems Engineer, Area Radiation Monitoring Systems
J. West	Ventilation Systems Engineer
J. White	Quality Control
W. Williams	BACC Program Owner

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Open/Closed

05000334/2006002-00	LER	Unit Shutdown Completed as Required by Plant Technical Specification for Failed Solid State Protection System Memory Card (Section 4OA3.4)
05000334/2006003-00	LER	Inadvertent Technical Specification Non-Compliance Due To Inoperable Containment Isolation Valve (Section 4OA3.5)
05000334/2006004-00	LER	Reactor Trip Due to a Failed Universal logic Board in Solid State Protection System (Section 4OA3.6)
05000334/2006005-00	LER	Failure to Comply with Technical Specification to De-Energize Safety Injection Flow Path Valves (Section 4OA3.7)

**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

Procedures

1OST-45.11, Rev. 16, Cold Weather Protection Verification  
 2OST-45.11, Rev. 17, Cold Weather Protection Verification  
 1/2OM-53C.4A.75.1, Rev 10, Acts of Nature - Tornado or High Wind Condition

Condition Reports

06-6991, 06-6992, 06-7914, 06-8452, 06-8583, 06-8604

Notifications

600331779, 600304341, 600326336, 600323433, 600326383, 600276586, 600331085, 600333151, 600350767, 600350768, 600331780, 600331781

Other

TMOD 2-06-06, 2-1 EDG Ventilation Damper

**Section 1R04: Equipment Alignment**

Procedures

2OST-39.3, Rev. 5, "125VDC Distribution Panels Check"

Drawings

1080-RM-47A, Revision 35, "Flow Diagram Circulating & Service Water Piping," Sheet 1  
1080-RM-47B, Revision 40, "Flow Diagram Circulating & Service Water Piping," Sheet 2  
1080-RM-47C, Revision 33, "Flow Diagram Circulating & Service Water Piping," Sheet 3  
1080-RM-47D, Revision 56, "Flow Diagram Circulating & Service Water Piping," Sheet 4  
1080-RM-47E, Revision 22, "Flow Diagram Circulating & Service Water Piping," Sheet 5  
1080-RM-47F, Revision 19, "Flow Diagram Circulating & Service Water Piping," Sheet 6

Condition Reports (IR)

06-8243

Technical Specifications

BVPS UFSAR Unit 2, Rev. 15  
BVPS UFSAR Unit 1 Section 8.5.2.3, EDG Auxiliary Systems

Other

2DBD-39, Rev. 6, "Design Basis Document for 125VDC Power System"  
Unit 1 1OM-36.3.B.5, Valve List - 1FO  
Unit 1 1OM-36.3.B.1, Valve List - 1DA  
Unit 1 1OM-36.3.B.3, Valve List - 1DLO  
Unit 1 1OM-36.3.B.2, Valve List - 1DCW  
Unit 2 Narrative Logs - Midnight shift, 10/19/2006

**Section 1R05: Fire Protection**

Other

Unit 2 Fire Protection Safe Shutdown Report, Addendum 25  
BVPS Unit 2 Updated Fire Protection Appendix R Review, Rev. 26  
Calculation 10080-B-085, Fire Hazards Analysis  
BVPS Unit 2 Fire Protection Safe Shutdown Report, Addendum 19  
Duct Insulation FE Material 9301417 Purchase Order Text  
BVPS Unit 2 PIPS M10.2, Thermal and Sound Insulation for BVPS Unit 2, Revision 4

CR 06-8016  
CR 06-7858

**Section 1R06: Flood Protection Methods**

Procedures

2OM-6.4.I, Rev. 2, "Draining the RCS for Refueling"  
2OM-51.4.I, Rev. 3, "Station Shutdown-Preparation for Entering Refueling (Mode 6)"  
2OST-6.2A, Rev. 25, "Computer Generated RCS Water Inventory Balance"  
2RP-2.6, Issue 0, Rev. 4, "Remove Reactor Vessel Studs/Clean"  
AOP-2.6.5, Shutdown LOCA  
AOP-2.10.1, RHR System Loss  
AOP-2.36.1, Loss of All AC while Shutdown  
IPTE - Draining Down the RCS for Refueling  
RWP 206-5002

**Section 1R07: Heat Sink Performance**

Procedures

1BVT 02.30.07, Charging Pump Lube Oil Cooler [Ch-E-7A, B or C] Heat Exchanger Thermal Performance Testing, Issue 1, Revision 0  
1/ 2 PMP-7CH-P-1A/21A-B-C-1M, Work Order 200160059, Charging/High-Head Safety Injection Pump Lubrication and Maintenance, Issue 4, Revision 16

Other

Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment"  
FORM 1 / 2 -ADM-2106.F01, Rev.1, Heat Exchanger Inspection Report  
EPRI Heat Exchanger Performance Monitoring Guidelines, NP-7552, December 1991  
BVPS UFSAR UNIT 1 Section 9.9, River Water System

Condition Reports (CR)

06-11569  
06-11305

**Section 1R08: Inservice Inspection**

Procedures

NDE-VT-510	NDE-VT-502	NDE-VT-513	NDE-VT-500
WDI-STD-119D	WDI-STD-1007	MRS-SSP-1985	MRS-SSP-1509
PDI-UT-8	NSBU-EIS-00-001	WDI-UT-013	WDI-UT-010

CR's

06-8213	06-7743	06-7109	06-8271	06-8478	06-7679
06-8049	06-3888				

Other

Mode Hold Resolution Forms, various  
Wesdyne Overlay Ultrasonic Examination Indication Report Sheets  
Pressurizer Surge Nozzle Overlay Profile  
PCI Energy Services Weld Overlay Repair Traveler  
Liquid Penetrant Examination Report Results, Penetrations #16, 45, 56, 61  
Wesdyne Guidelines for the On-Site Implementation of Ultrasonic Examinations for Structural Weld Overlays  
Status Update on BV-2 RPV Head Inspections & Plans for CRDM Nozzle Repairs  
Evaluation of Relief Request BV3-RV-04  
Ultrasonic Report Sheet Penetration No. 16, 45, 56, 61  
SG-SGDA-06-40, Preliminary Operational Assessment  
Response to Request for Additional Information on License Amendment Request regarding Revised Steam Generator Inspection Scope  
2R12 Steam Generator Degradation Assessment  
Response to Generic Letter 2004-01, Requirements for Steam Generator Tube Inspections  
Beaver Valley U2 Use of Appendix H Qualified Techniques 2R12 Refueling Outage  
1/2 ADM-2039 Beaver Valley ISI 10-Year Plans

Certifications

Memorandum, Review of NDE Certifications B Integrated Technologies Incorporated Personnel  
Various Performance Demonstration Initiative program documents  
Review of Supplemental NDE Personnel Documentation in Support of BV2R12 Pressurizer Structural Weld Overlay Project

**Section 1R11: Licensed Operator Requalification Program**

CR 06-9779

**Section 1R12: Maintenance Rule Implementation**

Condition Reports

06-04842, "2HVC-MOD201D Control Room Isolation Damper Failure"  
06-6303, "Extent of Condition of CR 06-04920 Motor Pinion Key Failure 2HVC-MOD201D"

**Section 1R13: Maintenance Risk Assessment and Emergent Work Control**

Procedures

1/2-ADM-2033, "Risk Management Program," Revision 4

Other

Beaver Valley Unit 1 PRA Risk profile, week of November 13, 2006  
Beaver Valley Unit 2 PRA Risk profile, week of November 27, 2006  
2R12 Outage Control Center Shift Turnover Report, October 18, 2006, 0630 hours  
2R12 Safety Shutdown Report, Revised October 20, 2006  
WO 200187882-003, Quench Spray Pump Discharge Flow Indicating Switch

**Section 1R15: Operability Evaluations**

Calculations

12241-NP(N)-X2A, Rev 5, A2  
12241-NP(N)-X2B, Rev 6, A2  
12241-NP(N)-X2C, Rev 4, A2  
12241-NP(N)-X2H, Rev 8, A2  
12241-NP(N)-X2Q, Rev 4, A1  
12241-NP(N)-X2R, Rev 4, A1  
12241-NP(N)-X2S, Rev 3, A2

Condition Reports

06-7444, 2SIS-MOV8887B Failure to Stroke Closed While Performing Valve Strokes  
06-7644, Extent of Condition of CR 06-7444 Motor Pinion Key Failure 2SIS-MOV8887B  
06-9399, MOV Motor Pinion Key Failure Extent of Condition  
06-7917, ASCO Hydromotor Actuator Pump and Pump Kits Notification  
06-8927, Failure to Generate New CR for Damper 2HCV-MOD202A Inoperability  
06-10398, U2 D/G Fuel Injection Pump Rack Bore Sleeve Needs Evaluated  
06-10449, 2-1 Emergency Diesel Generator Fuel Injector Failure

Miscellaneous

U1 & U2 Control Room Logs, dated October 16, 2006

10 CFR 50.59 Evaluations

No. 06-04732, Rev 0 for Initiating Activity No. ECP 02-0211, Rev 2: "Revised Steam Generator Tube Rupture Analysis."

**Section 1R17: Permanent Plant Modifications**

ECP-03-0213, Unit 2 'A' HHSI Pump Rotating Assembly. Plant Betterment  
ECP-02-0247, Unit 2 'A' High Head Safety Injection Pump Overhaul

Condition Reports

06-05023, 2OST-45.9 Failed Due to 2CHS-P21A Failing Transfer to the ASP  
06-04982, Loose Motor Coupling Key Found  
06-04977, Miss-Machining of 2CHS-21A Outboard Bearing Housing Locator Pin Holes  
06-04849, Aux Lube Oil Pump for Charging Pump As-Found Alignment Readings Out of Spec.  
06-04825, Holes in Discharge head for Balance Drum Cap Screws Not Completely Tapped

Other

RWP 206-2039  
WO 200036098



## **Section 1R19: Post-Maintenance Testing**

### Procedures

2OST-21.7, Rev. 13, "Main Steam Trip Valves [2MSS\*AOV101A,B,C] Full Closure Test"

### Work Orders

200241542    200233233    200235524

### Condition Reports

06-7073, [2RCS\*SG21C] MN STM ISOL VALVE

06-7927, Failure of 2-1 D/G Voltage Regulator

06-7937, Failure of 2-1 D/G to start using air start system #1 during maintenance test

06-8296, High Friction on 2MSS-AOV101C

06-10398, U2 D/G Fuel Injection Pump Rack Bore Sleeve Needs Evaluated

06-10449, 2-1 Emergency Diesel Generator Fuel Injector Failure

### Other

U2 Control Room Logs, dated October 12, 2006

U2 Control Room Logs, dated October 25-26, 2006

U2 Control Room Logs, dated November 21-22, 2006

## **Section 1R20: Refueling and Outage Activities**

### Surveillances

2OST-49.2, Rev. 14, Shutdown Margin Calculation, on October 6, 2006

2OST-11.10A, Rev. 14, "Boron Injection Flowpath Power Operated Valve Exercise Modes 5-6",  
on October 9, 2006

2OST-11.18, Rev. 11, "Low Head Safety Injection Pump Boric Acid Flowpath Verification", on  
October 9, 2006

2OST-49.3, Rev. 11, "Refueling Operations Prerequisites" on October 10, 2006

2BVT-1.13.5, Rev. 12, "Recirculation Spray Pump Test" on November 7, 2006

2RST-3.2, Rev. 11, "Incore Movable Detector Flux Mapping", on November 8, 2006

2MSP-9.4.M, "Containment Sump Inspection, Tank (2DAS-TK204)", Issue 4, Rev. 6 on  
November 9, 2006

2OM-47.2.B, "Containment Closeout Inspection", Rev. 4, on November 10, 2006

### Procedures

2OM-6.4.I, Rev. 2, "Draining the RCS for Refueling"

2OM-47.4.B, Rev. 6, "Personnel Air Lock Operations"

2OM-49.4.H, Rev. 10, "Movement of Spent Fuel Pool Crane Checklist"

2OM-51.4.I, Rev. 3, "Station Shutdown-Preparation for Entering Refueling (Mode 6)"

2OST-6.2A, Rev. 25, "Computer Generated RCS Water Inventory Balance"

2OST-7.8, Rev. 10, "Boric Acid Storage Tank and RWST Level and Temperature Verification"

2OST-47.3.E, Rev. 5, "Verification of Administrative Closure Controls for Containment / Fuel  
Building during Refueling"

2OST-49.3, Rev. 11, "Refueling Operations Prerequisites"

2RP-2.6, Issue 0, Rev. 4, "Remove Reactor Vessel Studs/Clean"  
 2RST-2.1, Issue 1, Rev. 8, "Initial Approach to Criticality After Refueling"  
 AOP-2.6.5, Shutdown LOCA  
 AOP-2.10.1, RHR System Loss  
 AOP-2.36.1, Loss of All AC while Shutdown  
 IPTe - Draining Down the RCS for Refueling  
 RWP 206-5002

Condition Reports

06-10094	06-9735	06-9734*	06-9712	06-9662	06-9432
06-9000	06-8751	06-8709	06-8627	06-8528	06-8340
06-8236	06-8135	06-8129	06-8102	06-8091	06-7992
06-7812	06-7747	06-7679	06-7677	06-7660	06-7612
06-7484	06-7370	06-7271	06-7069	06-6396	06-4314

Other

2OM-50.4.L, BV-2 Tabular Logs, dated November 6 - 11, 2006  
 2OM-50.5.A.11, Rev. 14, BV-2 RCS Heatup Plots and Data, dated November 6 - 11, 2006  
 2OM-52.4.R.1.F, Rev. 4, Primary Plant Cooldown Data and plots, dated October 2, 2006  
 2OM-52.4.R.2.F, Rev. 3, Pressurizer Cooldown Data and plots, dated October 2, 2006  
 2R12 Pre-Outage Shutdown Safety Report, dated September 27, 2006

Miscellaneous

Information Notice 2000-013, Typical Outage Risk Profile for PWR  
 Information Notice 1997-083, Recent Events Involving RCS Inventory Control During S/D  
 Unit 2 Cycle 13 Core Loading Pattern, dated October 23, 2006

**Section 1R22: Surveillance Testing**

2MSP-9.5.M, "Containment Sump Inspection, Tank (2DAS-TK204)", Rev. 6  
 2OST-7.4, "Operational Surveillance Test, Centrifugal Charging Pump 2CHS\*P21A," Rev. 28  
 2OST-7.5, "Operational Surveillance Test, Centrifugal Charging Pump 2CHS\*P21B," Rev. 30  
 2OST-7.6, "Operational Surveillance Test, Centrifugal Charging Pump 2CHS\*P21C," Rev. 28  
 BVPS Inservice Testing (IST) Program for Pumps and Valves  
 Engineering Change Request 02-0247, Revision 0

Calculations

10080--794, "Minimum Safeguards Safety Injection System performance for the Full Potential  
 (2900 MWT) Power Level & Containment Conversion"

Condition Reports

06-8685  
 06-7997, "Containment Isolation Valve 2CVS-93 Leakage Exceeds Admin Limit"

Other

TS Surveillance Requirement 4.5.2b.1

Work Order 200215029, Implemented the trevistest on the Unit 2 safety valve

8700-06.039-0081, Rev. H, Instructions for Installation and Maintenance Consolidated Safety Valves Nuclear type 3700

LAR 1A-302 & 2A-173, "BVPS License Amendment Request for Extended Power Uprate," Sections 1.1.2, 9.2.3.4, 9.4.1 and Appendix D, October 4, 2004

ASME/ANSI OM Standard, Part 6, "Inservice Testing of Pumps in Light Water Reactor Power Plants," (OM-6), OMa-1988 addenda to the OM-1987 edition

**Section 1R23: Temporary Plant Modifications**

Condition Reports

06-3216          06-7917          06-9664

Regulatory Applicability Determination and 10 CFR 50.59 Screens

06-05036

06-08372

Calculation

2710.180-174-041, "Stone and Webster Calculation: CO2 Required Concentration for EDG Building 2-1"

Other

Engineering Change Package 06-0307, Rev. 0

FSAR Section 9.4.6

Operating Phase SER for Beaver Valley Unit 2, Section 9.4.5.1

BVPS-2 Fire Protection Safe Shutdown Report, Addendum 28, Section 3.18

BVPS-1 Updated Fire Protection Appendix R Review, Revision 26, Section 3.4.9

Unit 2 Narrative Logs - Midnight shift, October 18, 2006

Part 21 Notification 2006-20-00, September 15, 2006, ASCO Letter to NRC

**Section 1EP6: Drill Evaluation**

Requalification Program Procedures

1/2-ADM-1357.F11, Rev. 0, Simulator Evaluation Scenario No. 2DRLS-E-3.009

1/2-ADM-1357.F07, rev. 0, Team Evaluation Form for Scenario No. 2DRLS-E-3.009

1/2-ADM-1357.F08, rev. 0, RO Evaluation Form for Scenario No. 2DRLS-E-3.009

1/2-ADM-1357.F09, rev. 0, SRO Evaluation Form for Scenario No. 2DRLS-E-3.009

1/2-ADM-1357.F10, rev. 0, STA Evaluation Form for Scenario No. 2DRLS-E-3.009

**Section 2OS1: Access Control to Radiologically Significant Areas and  
Section 2OS2: ALARA Planning and Controls**

Access Control to Radiologically Significant Areas/ALARA Planning & Controls

1/2-ADM-1601, Rev 13	Radiation Protection Standards
1/2-ADM-1611, Rev 8	Radiation Protection Administrative Guide
1/2-ADM-1621, Rev 3	ALARA Program
1/2-ADM-1630, Rev 9	Radiation Worker Practices
1/2-ADM-1631, Rev 5	Exposure Control
1/2-HPP-3.02.003, Rev 8	Decontamination Control
1/2-HPP-3.02.004, Rev 4	Area Posting
1/2-HPP-3.04.002, Rev 5	Bioassay Administration
1/2-HPP-3.05.001, Rev 4	Exposure Authorization
1/2-HPP-3.07.002, Rev 4	Radiation Survey Methods
1/2-HPP-3.07.013, Rev 3	Barrier Checks
1/2-HPP-3.08.001, Rev 8	Radiological Work Permit
1/2-HPP-3.08.003, Rev 9	Radiation Barrier Key Control
1/2-HPP-3.08.005, Rev 4	ALARA Review Program
1/2-HPP-3.08.006, Rev 1	Shielding
BVBP-RP-0003, Rev 3	Dosimetry Practices
BVBP-RP-0016, Rev 0	Survey Requirements During Plant Transients
NOP-WM-7001, Rev 0	ALARA Program
NOP-WM-7002, Rev 0	Operational ALARA Program
NOP-WM-7003, Rev 0	Radiation Work Permit
NOP-WM-7017, Rev 0	Contamination Control Program
NOP-WM-7021, Rev 0	Radiological Postings, Labeling, and Markings

Nuclear Oversight Field Observation Reports

BV220062768

Condition Reports

06-04185, 06-03374, 06-03145, 06-07131, 06-07128, 06-07113, 06-07127, 06-04143,  
06-04540, 06-03656, 06-04169, 06-04908, 06-03660, 06-03596, 06-04493, 06-03227,  
06-05032, 06-04213, 06-03795, 06-04393, 06-03734, 06-06887, 06-05100, 06-04209,  
06-04847, 05-02198

RWP/ALARA Plans

RWP#206-5019, ALARA Plan #06-2-08, Reactor Disassembly/Reassembly  
RWP#206-5038, ALARA Plan #06-2-22, Scaffolding  
RWP#206-5043, ALARA Plan #06-2-27, Modify, Clean, Inspect, RBC Sump  
RWP#206-5048, ALARA Plan #06-2-43, Pressurizer Weld Overlays - Top of Pressurizer  
RWP#206-5051, ALARA Plan #06-2-44, Pressurizer Weld Overlays - 738' & Surge Line Areas  
RWP#206-5017, ALARA Plan #06-2-06, Steam Generator Platform Support

ALARA Committee Meeting Minutes

Meeting Nos. 06-11, 06-09, 06-08, 06-07, 06-06, 06-05, 06-04

Miscellaneous Reports  
2R12 Outage ALARA Plan

**Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment**

Procedures

1/2-HPP-4.01.009, Rev 2	Model 89-400, Gamma Calibration System
1/2-HPP-4.01.011, Rev 0	Radioactive Source Standard Decay Correction
1/2-HPP-6.03.001, Rev 0	Model 81 Beam Irradiator
1/2-HPP-6.03.003, Rev 0	Dosimeters - Ion Chambers
1-HPP-4.02.003, Rev 3	Area Monitoring System (Unit 1)
2-HPP-4.02.019, Rev 2	Area Monitoring Subsystem (Unit 2)
1/2-HPP-4.04.02, Rev 1	Count Rate Meter - Model RM-14/RM-25
1/2-ADM-1626, Rev 1	Respiratory Protection Program
1/2-HPP-3.07.003, Rev 1	Airborne Radioactivity Sampling
1/2-HPP-3.10.013, Rev 0	MSA Self-Contained Breathing Apparatus
1/2-HPP-3.10.016, Rev 1	Biomarine BioPak 240P Self-Contained Breathing Apparatus
1/2-HPP-3.10.022, Rev 0	Emergency SCBA Weekly Surveillance
1/2-HPP-3.10.024, Rev 2	Maintenance of BioPak 240P Breathing Apparatus

Calibration Records

SAM-11:	Serial Nos.	135, 140, 290, 291 428
PNR-4:	Serial Nos.	441, 2873, 3380
RO-2	Serial No.	6266
RO-20:	Serial Nos.	4153, 4159, 4163
SPM-906:	Serial Nos.	025, 026, 027, 028, 029, 030, 104
DMC-2000	Serial Nos.	669523, 673436, 226660, 677005, 224745, 672741, 684126, 675300, 222736, 229272

FastScan whole body counting system  
AccuScan whole body counting system

SCBA ProCheck 3 Test Results

Regulator Serial Nos. 1N270009, 1N2071581N270165, 1N208009, 1N209007, 1N206000

Other Documents

Unit 1 and Unit 2 Radiation Monitoring System Health 2<sup>nd</sup> Quarterly Report 2006  
Site Radiation Monitoring System Status Report (September 2006)  
Dry Active Waste Instrument Response Evaluation (August 2005)  
Personnel Respirator Qualifications/Training Records  
Pro-Am Safety Inc. Air Quality Record, dated November 30, 2006  
Lesson Plan: Use of the MSA-401 SCBA  
Lesson Plan: Use of the BioPak 240P

Condition Reports

04-07545, 05-00645, 05-01759, 05-04520, 05-05850, 06-00741, 06-03316, 06-04288, 06-04974, 06-09649, 06-05000, 06-03100, 06-11416, 06-02319, 06-08254, 06-08077, 06-01066

Nuclear Quality Assessment Field Observation Reports

BV220062820, BV120062616, BV120062608, BV120062582, BV120062486, BV120062503, BV120062655, BV220062819

Nuclear Oversight Quarterly Assessment Reports

1<sup>st</sup> Quarter 2006, 3<sup>rd</sup> Quarter 2005, 2<sup>nd</sup> Quarter 2005, 1<sup>st</sup> Quarter 2005, 4<sup>th</sup> Quarter 2004

**Section 4OA1: Performance Indicator (PI) Verification**

See sections 2OS1, 2OS2, 2OS3, 4OA5 (2515/TI169)

**Section 4OA2: Problem Identification and Resolution**

Procedures

BV1 1DBD-33B, Design Basis Document for Fire Protection System, Rev 10, dated September 7, 2005

BV2 2DBD-33B, Design Basis Document for Fire Protection System, Rev. 7, dated March 15, 2006

Plant Engineering Review Form for CR 05-04770 on BV-IS05-8 EQUIP, Unit 1 RWS intake structure flood door #8 for "C" cubicle, July 28, 2005

Plant Engineering Review Form for CR 05-6957, BV-2SWS-RQ100A/C, RSS HX Radiation Monitors, October 13, 2006

Plant Engineering Review Form for CR 05-05414, 2SWS-P21A, Service Water Pump, August 31, 2005

Plant Engineering Review Form for CR 04-03704-01, 2SWE-P21B, Standby Service Water Pump, May 28, 2004

Plant Engineering Review Form for CR 05-07930, BV-4KVS-2AE-2E14, CKTBRK, BV2 System 36B, 4KV Bus 2AE, cubicle 4KVS-2AE-2E14, SWS P21C failed to auto start as expected, January 5, 2006

Basis for Continued Operation 1-05-001, CR 05-04414 and 05-04425, June 19, 2005

Plant Engineering Review Form for CR 05-01630, 1WR-P-1A, Pump, April 1, 2005

Plant Engineering Review Form for CR 06-02196, MOV-1RW-102A1, April 24, 2006

Unit 1, System 30, table of MSPI data, December 21, 2006

Unit 2, System 30, table of MSPI data, December 21, 2006

BVBP-OPS-0002, "Operator Work-Arounds, Operator Burdens, and Control Room Deficiencies" Rev 11

BVBP-OPS-0002, "Operator Work-Arounds, Operator Challenges, and Control Room Deficiencies" Rev 10

Unit 1 Operator Work Around, Challenges, Control Room Deficiencies, and Compensatory Actions Summary Dated July 1, 2005

Unit 2 Operator Work Around, Challenges, Control Room Deficiencies, and Compensatory Actions Summary Dated July 1, 2005

Notifications and CRs

200011790	200014253	200091850	200143389
200149229	200157437	200205223	200226555
200228554	200223265	200223554	200223555
200233635	CR 06-01757	CR 06-02824	CR 06-03959
CR 02-01098	CR 02-04508	CR 02-04780	CR 03-00351
CR 03-08194	CR 03-08679	CR 03-08684	CR 03-11947
CR 04-01830	CR 04-03877	CR 04-04596	CR 04-05135
CR 04-07441	CR 05-02256	CR 05-02526	CR 05-03198
CR 05-03940	CR 05-04399	CR 05-04414	CR 05-04425
CR 05-05214	CR 05-06514	CR 05-06693	CR 05-07431
CR 06-02062	CR 06-03609	CR 06-03619	CR 06-03630
CR 06-03764	CR 06-05051	CR 06-11370	CR 06-11385

**Section 4OA3: Followup of Events and Notices of Enforcement Discretion**

4OA3.1

Procedures

2OM-23B.2.A, Issue 4, Rev.3, "Precautions and Limitations"  
 2OM-23B.4.A, Rev. 19, "Heater Drain System Startup"  
 2OM-53C.4.2.51.1, Rev. 11, "Emergency Shutdown"

Drawings

10090-RM-423A-1, Rev. 5, "Valve Oper. NO. Dia. - Extraction Steam Piping"  
 10090-RM-423B-1A, Rev. 8, "Valve Oper. NO. Dia. - Reheat and Heater Drains"  
 10090-RM-423B-2B, Rev. 3, "Valve Oper. NO. Dia. - Reheat and Heater Drains"

Miscellaneous

Unit 2 Plant Information Data printouts, November 16-17, 2006  
 Control Room logs, November 16-17, 2006

Condition Reports

CR 06-10139, "Unit 2 Reactivity Excursion Due to Feedwater Heater Level Transient"  
 CR 06-10140, "Unit 2 Feedwater Heater Level Oscillation"  
 CR 06-10141, "2ESS-MOV105A Maintained Out of NSA"  
 CR 06-10150, "Communications to Offsite Agencies During Loss of Extraction Steam"

**Section 4OA5: Other Activities**

Extended Power Uprate (EPU) - Related Inspection Activities

2-SPT-52-40441-2, Rev. 3, " 3% Power Uprate Escalation to Power (2770 MWT)"  
 2BVT-01.06.01, "RCS Flow", on November 22, 2006  
 2MSP-6.40.I, "Tave - T432", on November 16, 2006  
 2MSP-6.79.I, "Delta T", on November 15, 2006  
 SGTR Training Course No. MISC-TLBD-ECP-02-0211

Inspection Procedure	Title	Inspection Report	Description and 71004 Section
71004	Power Uprate	06-05	BV1 and BV2 Flow-accelerated corrosion program (Dec 2006) (2.02.f)  BV2 EPU Phase 1 (3%) power ascension control room observations and plant walkdowns (2.02.d)  BV2 EPU post-Phase 1 neutron flux mapping. (2.02.d/e)
71111.15	Operability Evaluations	06-05	BV2 Operability Assessment and 50.59 EPU-related safety analysis for revised SGTR (2.02.a/d/g)
71111.17A	Permanent Plant Modifications	06-05	BV2 High Head Safety Injection Pump 2CHS-P21A Rotating Assembly Replacement
71111.22	Surveillance Testing	06-05	BV2 High Head Safety Injection System System throttling 2OST-11.14B (4th Qtr 2006) (2.02.c)

Calculations

10080-DMC-0900, Hydraulic Analysis of Top-Hats and Containment Sump Structure, Rev. 0  
 10080-DSC-0290, Structural Analysis for the Waterbox Extensions - Recirculation Spray System, Rev. 0  
 10080--843, Mass and Surface Areas of the Containment Sump Strainer, Rev. 0

Notifications

06-6492	06-7366	06-04122	06-7198
06-6835	06-8051	06-04154	06-04119

Drawings

10080-RP-0079J, Containment Recirculation Spray Suction Extensions in Sump, Rev. 4  
 FNOCBV024-C-001, Containment Building Sump Strainer Location Plan, Rev. 3  
 FNOCBV024-C-002, Beaver Valley Sump Strainer Top Hat Assembly 15" OD, Rev. 2  
 FNOCBV024-C-003, Beaver Valley Sump Strainer Top Hat Assembly 18" OD, Rev. 2  
 FNOCBV024-C-004, BV2 Sump Filter Element, Rev. 3  
 FNOCBV024-C-101, Containment Building Sump Strainer Segment A Plan & Section, Rev. 2  
 FNOCBV024-C-107, Containment Building Sump Strainer Segment A Plan, Sections & Detail Rev. 2  
 FNOCBV024-C-112, Containment Building Sump Strainer Bay 1 Horizontal 9" Dia. Top Hat Plan and Sections, Rev. 2  
 FNOCBV024-C-113, Containment Building Sump Strainer Bay 2 Horizontal 9" Dia. Top Hat



Plan & Sections, Rev. 2  
 FNOCBV024-C-114, Containment Building Sump Strainer Bay 3 Horizontal 9" Dia. Top Hat  
 Plan & Sections, Rev. 2  
 FNOCBV024-C-119, Containment Building Sump Strainer Misc. Plate Details, Rev. 1  
 C1-510-212-7A Steam Drain System (SDS) Main Steam & Cable Vault Area  
 200607 Extraction Steam - Turbine Bldg EI 752' 6"  
 200403-1 2<sup>ND</sup> Extraction Steam - Turbine Bldg EI 752' 6"  
 200404-3G Extraction Steam (ESS) Turbine Bldg EI 752' 6"  
 200404-3G (RFO) Refuel Exam History - Extraction Steam (ESS) Turbine Bldg EI 752' 6"  
 202708-1 Feedwater Heater Vent (SVH) Turbine Bldg EI 752' 6"  
 202707-0 Feedwater Heater Relief Vents-Drains Turbine Bldg EI 752' 6"

Miscellaneous

05-0362-01, Engineering Change Package: Unit 2 Reactor Containment Building Emergency  
 Recirculation Sump Mods - Strainer Modifications, Rev. 17  
 05-0362-03, Engineering Change Package: Unit 2 Reactor Containment Building Emergency  
 Recirculation Sump Mods - Electrical and Conduit Modifications, Rev. 9  
 05-0362-04, Engineering Change Package: Unit 2 Reactor Containment Building Emergency  
 Recirculation Sump Mods - Pump Suction Pipe Modifications, Rev. 3  
 05-05829, 10 CFR 50.59 Screen: Replacement of the Containment Sump Strainer, Rev. 2  
 L-05-034, Beaver Valley Power Station, Unit Nos.1 and 2 Response to Generic Letter 2004-02,  
 "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis  
 Accidents at Pressurized-Water Reactors," dated March 4, 2005  
 L-05-123, Beaver Valley Power Station, Unit Nos.1 and 2 Response to Request for Addition  
 Information on Generic Letter 2004-02, dated July 22, 2005  
 L-05-146, Beaver Valley Power Station, Unit Nos.1 and 2 Response to Generic Letter 2004-02,  
 "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis  
 Accidents at Pressurized-Water Reactors," dated September 6, 2005  
 L-06-020, Beaver Valley Power Station, Unit Nos.1 and 2 Response to Generic Letter 2004-02,  
 "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis  
 Accidents at Pressurized-Water Reactors," dated April 3, 2006  
 L-06-145, Revised Commitment Dates Relevant to FirstEnergy Nuclear Operating Company  
 Correspondence to the NRC, dated September 29, 2006  
 USNRC Letter: Beaver Valley Power Station, Unit 2 - Request for Scheduling Extension from  
 Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency  
 Recirculation during Design Basis Accidents at Pressurized Water Reactors," dated  
 May 18, 2006  
 BV-SA-06-145 Self Assessment - FAC Program Compliance (IP 49001)  
 Self Assessment Report Flow Accelerated (FAC) Program, dated January 17, 2006  
 Master Assessment Plan E-EN, dated July 24, 2006  
 Extraction Steam Maintenance Rule system (23A) health report, 2006-2  
 Health Improvement Plan for Extraction Steam (system 23A), 2006-2  
 NDE certifications of wall thickness testing personnel for 1R17, dated February 3, 2006  
 2R12 FAC Report of components examined (Unit 2, 2006), dated November 8, 2006  
 2ES-110-12E UT Summary Sheet, elbow 2FWS-H24B  
 BV Implementation of Erosion Corrosion Program, dated July 18, 1989  
 NSAC-202L-R2 Recommendations for an Effective Flow-Accelerated Corrosion Program

Procedures

05-05829, Regulatory Applicability Determination, Rev. 1  
1/2-ADM-0700, Guidelines for Plant Labeling and Tagging, Rev. 2  
2MSP-9.04-M, Containment Sump (2DAS-TK204) Inspection, Rev. 6  
NOP-CC-2003, Engineering Changes, Rev. 9  
NOP-CC-2004-01, Design Interface Review Checklist - BV, Rev. 7  
1/2-ADM-2205 R0 Flow-Accelerated Corrosion (FAC) Program (Units 1 & 2)  
NOP-ER-2005 R0 Flow Accelerated Corrosion Management Program  
UT-308 R13 Component Weld Profiling & Thickness using Straight Beam UT

Condition Reports

06-7104 Wall thickness below screening criteria, line 2-SDS-001-135-4  
06-8011 Wrong Orifice Plate Installed in 2SIS-FE943

Temporary Instruction (TI) 2515/169 - Mitigating Systems Performance Index Verification and  
NEI 99-02, Rev. 4, Regulatory Assessment Performance Indicator Guideline  
NRC Regulatory Issue Summary 2006-07, Changes to the Safety System Unavailability PI's.

BVRM-RAS-0001, Rev 1, MSPI Basis Document BVPS 1  
BVRM-RAS-0002, Rev 1, MSPI Basis Document BVPS 2  
Beaver Valley 1 Performance Indicators from 4th quarter 2004 - 3rd quarter 2006, inclusive  
Beaver Valley 2 Performance Indicators from 4th quarter 2004 - 3rd quarter 2006, inclusive  
Beaver Valley Unit 1 and Unit 2 Critical Hour data  
BVPS Unit 1 Unavailability and Failure data from January 2002 - November 2006 and system  
boundary diagrams for the following systems:  
Sys 36A - Emergency Diesel Generator, (January 2000 - November 2006);  
Sys 07 - High Head Safety Injection;  
Sys 24B - Auxulary Feedwater;  
Sys 11 - Safety Injection (RHR);  
Sys 13 - Containment Depressurization (RHR); and  
Sys 30 - River Water.

BVPS Unit 2 Unavailability and Failure data from January 2002 - November 2006 and system  
boundary diagrams for the following systems:  
Sys 36A - Emergency Diesel Generator, (January 2000 - November 2006);  
Sys 07 - High Head Safety Injection;  
Sys 24B - Auxiliary Feedwater;  
Sys 11 - Safety Injection (RHR);  
Sys 13 - Containment Depressurization (RHR); and  
Sys 30 - Service Water.

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Beaver Valley MSPI Indicator Margin Remaining in Green Report, dated December 4, 2006  
Beaver Valley MSPI Derivation Reports for:  
Unit 1 EAC Oct 2006 - URI;  
Unit 1 EAC Oct 2006 - UAI;  
Unit 1 HPI Oct 2006 - UAI;

Unit 2 EAC Oct 2006 - URI;  
Unit 2 HPI Oct 2006 - URI;  
Unit 2 EAC Oct 2006 - UAI; and  
Unit 2 HPI Oct 2006 - UAI.

NOBP-LP-4012, Rev.0, NRC Performance Indicators  
NOBP-LP-4012-24, Rev.0 MSPI Data Forms  
1ICP-24-FIS151A, Issue 4 Rev. 3, FIS-1FW151A Auxiliary Feedwater Pump 1FW-P-3A  
Recirculation Flow Indicator Calibration  
1OM-7.4.W, Rev. 24, Placing the Spare/Standby Charging Pump into Operation  
1OM-24.4.AE, Rev. 1, Swapping the Discharge Header for [1FW-P-2] Turbine Driven Auxiliary  
Feed Pump  
1OM-30.4.AG, Rev. 11, Standby Reactor Plant River Water Pump Shutdown and Swapping  
Pumps  
1OST-7.5, Revision 36, Operating Surveillance Test Centrifugal Chargin Pump  
Test [1CH-P- 1B]  
1OST-24.4, Rev. 34, Steam Turbine Driven Auxiliary Feed Pump Test [1FW-P-2]  
2OST-24.4, Rev. 58, Steam Driven Auxiliary Feed Pump [2FWE\*P22] Quarterly Test  
2OST-30.20A, Rev. 2, Service Water System Operating Surveillance Test Train A RSS HXs  
and SWS Supply Header Dry Layout Check  
CR 06-07508, Mitigating Systems Performance Index Basis Doc Discrepancies  
CR 06-05015, EPIX Data Input into MSPI Calculations  
CR 06-04996, MSPI Data Correction  
CR 06-04853, Readjustment of NRC Performance Indicators for July  
CR 06-04770, MSPI 7/19/06 Submittal Data Correction  
CR 06-04315, 2FWE-P23A Demand Failure - Impact on MSPI Margin  
CR 05-05594, RFA-MSPI-River/Service Water Train Boundaries

**Section 40A7: Licensee-Identified Violations**

Calculations

Engineering Assessment      Scaffold Interference With Operation Of MSIVs

Other

Root Cause Analysis Report for CR-06-7046      Scaffold Interference with operation of  
MSIV 2MSS-AOV101A/B causes entry into  
Technical Specification 3.0.3

Procedures

1/2-ADM-0810      Scaffold Erection and tagging, Rev. 5  
NOBP-LP-2008      FENOC Corrective Action Review Board, Rev. 6

**LIST OF ACRONYMS**

A/C	Air Conditioning
ADM	Administrative Procedure
AFW	Auxiliary Feedwater
ASME	American Society Mechanical Engineers
BVPS	Beaver Valley Power Station
CFR	Code of Federal Regulations
CR	Condition Report(s)
DBD	Design Basis Document
ECCS	Emergency Core Cooling System
EC/FAC	Erosion-Corrosion/Flow-Accelerated-Corrosion
EPRI	Electric Power Research Institute
EPU	Extended Power Uprate
EDG	Emergency Diesel Generator
FENOC	First Energy Nuclear Operating Company
FOSAR	Foreign Object Search and Removal
GDC	General Design Criteria
GL	Generic Letter
HHSI	High Head Safety Injection
HPSI	High Pressure Safety Injection
HRA	High Radiation Area
HX	Heat Exchanger
KV	kilovolt
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPA	Integrated Performance Assessments
IPTe	Infrequently Performed Test or Evolution
ISI	Inservice Inspection
LCO	Limiting Conditions for Operation
LER	Licensee Event Report
LP	Liquid Penetrant
MIC	Microbiologically Influenced Corrosion
MSPI	Mitigating Systems Performance Index
NDE	Non Destructive Examination
NRC	Nuclear Regulatory Commission
OST	Operations Surveillance Test
PCE	Personnel Contamination Event Report
PCM	Personnel Contamination Monitor
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PWSCC	Primary Water Stress-Corrosion Cracking
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RHR	Residual Heat Removal system
RPV	Reactor Pressure Vessel
RSS	Recirculation Spray System

RWP	Radiation Work Permit
RWS	River Water System
SAM	Small Article Monitor
SCBA	Self-Contained Breathing Apparatus
SPDS	Safety Parameter Display System
STA	Shift Technical Advisor
SWS	Service Water System
TI	Temporary Instruction
TS	Technical Specification
TSAS	Technical Specification Action Statement
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Testing
VHRA	Very High Radiation Area
VT	Visual Test
WO	Work Order