

July 30, 2004

Mr. William Pearce
Vice President
FirstEnergy Nuclear Operating Company
Post Office Box 4
Shippingport, Pennsylvania 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC INTEGRATED INSPECTION
REPORT 05000334/2004004 AND 05000412/2004004

Dear Mr. Pearce:

On June 30, 2004, 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 July 23, 2004 with you and other members of your staff.

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

Based on the results of this inspection, this report documents two NRC-identified findings of very low safety significance (Green). Both of these findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. Additionally, two licensee-identified violations which were determined to be of very low safety significance are listed in this report. If you contest anything in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Beaver Valley.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosures, and your response (if any) will be available electronically for public inspection in the

Mr. William Pearce

2

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).

Sincerely,

/RA by Richard S. Barkley Acting For/

Peter Eselgroth, Chief
Reactor Projects Branch 7
Division of Reactor Projects

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

Enclosures: Inspection Report 05000334/2004004; 05000412/2004004
w/Attachment: Supplemental Information

cc w/encl:

J. Lash, Plant General Manager
V. Kaminskis, Director, Nuclear Maintenance
R. Mende, Director, Nuclear Work Management
T. Cosgrove, Director, Nuclear Engineering/Projects
L. Freeland, Manager, Nuclear Regulatory Affairs/Performance Improvement
M. Clancy, Mayor, Shippingport, PA
R. Janati, Chief, Division of Nuclear Safety, Commonwealth of Pennsylvania
C. O'Claire, State Liaison to the NRC, State of Ohio
D. Hill, Chief, Radiological Health Program, State of West Virginia
R. Chiodo, Beaver County Emergency Management Agency

Distribution w/encl (VIA E-MAIL):

Region I Docket Room (with concurrences)

S. Collins RA

J. Wiggins, DRA

P. Eselgroth, DRP

R. Barkley, DRP

P. Cataldo, DRP/SRI

C. Miller, OEDO

C. Holden, NRR

R. Laufer, NRR

T. Colburn, PM, NRR

R. Guzman, Backup PM, NRR

DOCUMENT NAME:C:\ORPCheckout\FileNET\ML042120506.wpd

After declaring this document "An Official Agency Record" it **will** be released to the Public.

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	PCataldo/ RSB for	RBarkley/ RSB	PEselgroth/ RSB for		
DATE	07/20/04	07/29/04	07/30/04		

OFFICIAL RECORD COPY

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 50-334, 50-412

License Nos: DPR-66, NPF-73

Report Nos: 05000334/2004004 and 05000412/2004004

Licensee: First Energy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Post Office Box 4
Shippingport, PA 15077

Dates: April 1, 2004 - June 30, 2004

Inspectors: P. Cataldo, Senior Resident Inspector
G. Smith, Resident Inspector
T. Moslak, Health Physicist
J. Furia, Health Physicist
D. Merzke, Reactor Inspector

Approved by: P. Eselgroth, Chief
Reactor Projects Branch 7
Division of Reactor Projects

CONTENTS

SUMMARY OF FINDINGS	iii
REACTOR SAFETY	1
1R01 Adverse Weather Protection	1
1R04 Equipment Alignments	2
1R05 Fire Protection	2
1R06 Flood Protection Measures	3
1R07 Heat Sink Performance	4
1R11 Licensed Operator Requalification	4
1R12 Maintenance Rule Implementation	5
1R13 Maintenance Risk Assessment and Emergent Work Control	7
1R14 Personnel Performance During Non-routine Plant Evolutions	10
1R15 Operability Evaluations	11
1R16 Operator Work-Arounds	12
1R17 Permanent Plant Modifications	13
1R19 Post-Maintenance Testing	13
1R22 Surveillance Testing	14
1R23 Temporary Plant Modifications	15
1EP6 Drill Evaluation	15
RADIATION SAFETY	16
2PS2 Radioactive Material Processing and Transportation	16
2PS3 Radiological Environmental Monitoring Program (REMP)	19
OTHER ACTIVITIES	21
4OA1 Performance Indicator Verification	21
4OA2 Identification and Resolution of Problems	22
4OA3 Event Followup	26
4OA5 Other	27
4OA6 Management Meetings	27
4OA7 Licensee-Identified Violations	28
ATTACHMENT: SUPPLEMENTAL INFORMATION	A-1
KEY POINTS OF CONTACT	A-1
LIST OF ITEMS, OPENED, CLOSED, AND DISCUSSED	A-2
LIST OF DOCUMENTS REVIEWED	A-2
LIST OF ACRONYMS	A-3

SUMMARY OF FINDINGS

IR 05000334/2004004, IR 05000412/2004004; 04/01/2004 - 06/30/2004; Beaver Valley Power Station, Units 1 & 2; Maintenance Rule Implementation, Maintenance Risk Assessment and Emergent Work, Operability Evaluations, Event Followup.

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

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The Inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because inadequate corrective action associated with emergency diesel generator (EDG) ventilation temperature switch failures caused the affected EDG to be rendered inoperable. These temperature switches were subsequently bypassed by a temporary modification to restore EDG operability. (Section 1R12)

This finding is greater than minor because it affected the availability and reliability of a mitigating systems component. The finding is of very low safety significance since operator action is considered highly probable to ensure the EDG would continue to perform its design basis accident mitigation function.

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because inadequate corrective action associated with boric acid leakage caused a low head safety injection (LHSI) pump to be rendered inoperable. The affected pump was subsequently repaired and returned to service. (Section 1R13)

This finding is greater than minor because it affected the availability and reliability of a mitigating systems component. The finding is of very low safety significance because the LHSI pump was out of service for less than its allowed outage time of 72 hours.

B. Licensee Identified Violations

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

REPORT DETAILS

Summary of Plant Status

Unit 1 operated essentially at 100 percent power throughout the inspection period, with two exceptions. On 04/09/2004, the unit reduced power to approximately 77 percent power, to perform repairs on a valve in the steam generator blowdown system. Between 6/13-15/04 the unit down-powered by approximately 1.5 percent power due to a loss of power to the Feedwater Leading Edge Flowmeter.

Unit 2 operated essentially at 100 percent power throughout the inspection period, with a few exceptions. Between 4/23-27/04, the unit down-powered to approximately 75 percent power to perform main condenser waterbox cleaning. Between 5/15-16/04, the unit down-powered to approximately 60 percent power to perform emergent main feedwater pump equipment repairs. Also, on June 17, the unit performed a slight down-power of 3 percent power due to main condenser thermal performance.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 sample)

a. Inspection Scope

The inspectors reviewed the Beaver Valley design features and FENOC's implementation of procedures to protect risk significant mitigating systems from adverse weather effects due to high temperatures. This review included the implementation of FENOC's seasonal readiness activities for high heat weather conditions. The inspectors conducted interviews with various station personnel in order to gain insights to the station's warm weather readiness program, and reviewed various portions of the condenser waterbox cleaning maintenance efforts. The inspectors reviewed the corrective action program database, operating experience, and the Updated Final Safety Analysis Report (UFSAR), to determine the types of adverse weather conditions to which the site is susceptible, and to verify if the licensee was identifying and resolving weather-related equipment problems.

b. Findings

No findings of significance were identified.

Enclosure

1R04 Equipment Alignments (71111.04)a. Inspection ScopePartial System Walkdowns (3 samples)

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

- On April 13, 2004, the inspectors performed a walkdown of the Unit 2 Emergency Diesel Generator (EDG) No. 2, while the No. 1 EDG was out of service for a maintenance outage.
- On April 28, 2004, the inspectors performed a walkdown of the Unit 1 'B' low head safety injection (LHSI) train while the 'A' LHSI train was out of service due to a casing plug failure on the 'A' LHSI pump.
- On June 7, 2004, the inspectors performed a walkdown of the Unit 1 Reactor Plant River Water (RPRW) System while the '1B' RPRW pump was out of service due to a bearing replacement.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05 - 9 samples)a. Inspection Scope

Fire Area Walkdowns. The inspectors reviewed the Unit 1 Updated Fire Protection Appendix 'R' Review, Rev. 16, and the Unit 2 Fire Protection Safe Shutdown Report, Addendum 18, and identified the following risk significant areas:

- Unit 1/2 Intake Structure Cubicle 'A' (Fire Area IS-1)
- Unit 1/2 Intake Structure Cubicle 'B' (Fire Area IS-2)
- Unit 1/2 Intake Structure Cubicle 'C' (Fire Area IS-3)
- Unit 1/2 Intake Structure Cubicle 'D' (Fire Area IS-4)
- Unit 2 Emergency Switchgear Room (Fire Area SB-1)
- Unit 2 Emergency Switchgear Room (Fire Area SB-2)
- Unit 2 Battery Room 2-1 (Fire Area SB-6)
- Unit 2 Battery Room 2-3 (Fire Area SB-7)
- Unit 2 Battery Room 2-2 (Fire Area SB-8)

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

Fire Brigade Drill. On May 30, 2004, the inspectors observed a fire drill in the Unit 2 cable spreading room, that involved a simulated cable tray fire followed by a CO2 actuation. The drill was conducted in accordance with the drill guide, "Fire Drill Scenario/CB-03," dated April 14, 2004, and was considered an announced drill. The inspectors evaluated: 1) effectiveness of communications during the drill; 2) assessment of the fire and the use of proper fire-fighting strategies in accordance with 2PFP-CNTB-725, Rev 0; 3) adequacy and condition of fire fighting equipment; 4) control room response to the fire including emergency plan execution and control room evacuation considerations; 5) knowledge and skill of the fire brigade, including the use of personal protective equipment; and 6) effectiveness of the brigade leader in directing the actions of the fire brigade team. The inspectors attended the post-drill critique and assessed FENOC's drill evaluation and subsequent conclusions regarding the fulfillment of drill objectives.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and Individual Plant Examination of External Events to evaluate the design basis and risk significance of external floods. The inspectors reviewed 1/2 MI-75-MANHOLE-1E, "Inspection of Manholes for Water Induced Damage," Rev. 3, in preparation for a scheduled inspection of manhole 1EMH-8B, which contains safety-related 4160 volt (V) and 480V electrical cables that supply components of the river water and service water systems located in the intake structure. Because the cables located in this manhole were found submerged immediately prior to the inspection, the inspectors evaluated the cables, cable trays, and conduit for visible degradation after the manhole was pumped out. Additionally, the inspectors discussed the submerged cable issue with the station's cognizant electrical design engineer, and reviewed supporting documentation regarding the acceptability of submerged cable. The inspectors reviewed the following additional documents:

- Drawing 8700-RE-32A, "Ductline Plan and Details, Sheet 1," Rev. 16.
- Drawing 8700-RE-100A-8, "4KV Station Service System," Rev. 8.
- CR 02-02348, "NRC IN 2002-12, Submerged Safety-Related Electrical Cables"
- CR 02-02302, "OE 13296 Review"

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07 - 1 sample)

a. Inspection Scope

The inspectors reviewed FENOC's surveillance and control of heat exchanger performance by reviewing the results of a Unit 2 heat exchanger inspection for the "B" component cooling water heat exchanger, 2CCP-E21B. The review included an assessment of condition report (CR) 04-03311, and the heat exchanger inspection report performed in accordance with 1/2-ADM-2106, Rev. 0, "River/Service Water System Control And Monitoring Program." The inspector reviewed the results and evaluated against applicable acceptance criteria, and verified the inspection was consistent with GL 89-13, "Service Water System Problems Affecting Safety-Related Equipment."

b. Findings

No findings of significance were identified

1R11 Licensed Operator Requalification (71111.11 - 1 sample)

a. Inspection Scope

The inspectors observed the conduct of Unit 2 licensed operator requalification training evaluations conducted in the simulator on June 28, 2004. The inspectors observed licensed operator performance, including: effective communications, implementation of normal, abnormal and emergency operating procedures, command and control, technical specification compliance, and emergency plan implementation (See Section 1EP6). The inspectors evaluated simulator fidelity to ensure major plant configurations or changes were captured in the simulator to ensure adequate training was provided. Inspectors evaluated the staff evaluators during the examination to verify identified deficiencies in operator performance were properly identified, and that identified conditions adverse to quality were appropriately entered into the licensee's corrective action program for resolution. Other documents utilized in this inspection include the following:

- 1/2-ADM-1351, Rev. 2 Licensed Operator Retraining Program
- 1/2-ADM-1357, Rev. 5 Conduct of Simulator Training
- 1/2-ADM-1359, Rev. 7 Simulator Configuration Control

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12 - 2 samples)a. Inspection Scope

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

- CR-04-03672 2HVD-FN270B (2-2 EDG Ventilation Fan) Stopped during OST-36.2
- CR-04-03704 Failure to Complete 2OST-30.1B Due to High Pump Vibrations

b. Findings

Introduction. A Green NCV was identified for failure to adequately address and resolve a condition adverse to quality associated with the Unit 2 EDG ventilation system as prescribed in 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action."

Description. On April 28, 2004, during a monthly run of the 2-2 EDG, in accordance with 2OST-36.2, Rev. 42, "Emergency Diesel Generator [2EGS*EG2-2] Monthly Test," the control room received a room high temperature annunciator alarm. Initially, FENOC determined that the room ventilation supply fan, 2HVD-FN270B, had tripped, which receives a start signal when the EDG is started. The fan was subsequently restarted, but tripped again 8 minutes later, and the 2-2 EDG was declared inoperable in accordance with TS 3.8.1.1.

An event review team was formed to determine the cause of the fan failure, and subsequently identified that at least one of four EDG room temperature switches, 2HVD-TS-121A,B,C, or D had caused the trip of the supply fan, as well as the room exhaust fan, 2HVD-FN222B. The temperature switches are designed to trip the EDG ventilation fans and reposition dampers at 150°F due to a fire in the room, in advance of carbon dioxide (CO₂) actuation that occurs at 190°F. FENOC's investigation later revealed that three of the four temperature switch circuit cards in the ventilation circuitry were either failed or operated erratically, and were attributed to age-related failures of the electrolytic capacitors, or mis-operation of field-effect transistors. While the cards were estimated to be at least fifteen years old and have not been replaced since initial installation, industry experience has shown that capacitors of this type have an effective life of approximately ten years.

Enclosure

The inspectors identified that on October 3, 2003, CR 03-10434 detailed that functional testing of the 2-2 EDG room temperature control switches revealed that one of the four temperature switches failed while discrepancies in setpoint actuation were noted on the remaining three switches. The failed temperature switch, 2HVD-TS-121A, was subsequently replaced while the remaining three were recalibrated. A subsequent CR 03-12146, described a condition where the supply fan 2HVD-FN270B had tripped following a shutdown of the EDG. The fan's seal-in circuit should have maintained the fan running with the EDG secured, and while various potential causes were evaluated, FENOC failed to consider a spurious actuation of these temperature switches.

Subsequently, FENOC implemented a temporary modification that installed electrical jumpers in the temperature switch circuits, which effectively prevented the switches from impacting the EDG ventilation system. As a result, the 2-2 EDG was successfully tested and declared operable on April 30, 2004.

Analysis. FENOC's failure to identify and correct degrading temperature switches that provided fire protection functions for the EDG rooms, coupled with the lack of preventive maintenance, was determined to be a performance deficiency. This deficiency led to an unnecessary isolation of the EDG 2-2 room ventilation during a surveillance test run. While isolation of the ventilation did not immediately cause an EDG trip, FENOC estimated that EDG operation would be impacted by high room temperatures, without operator intervention, after approximately 4 hours. This issue is considered more than minor because it was associated with the equipment reliability attribute of the Mitigating Systems cornerstone. The inspectors assumed an exposure time of one-half the time since the completion of the last EDG 2-2 surveillance test, or 14 days. In accordance with IMC 0609 Appendix A, the issue needed a Phase 2 evaluation, because it represented a condition where the EDG would have been unavailable for longer than its TS LCO time.

The inspectors performed a Phase 2 analysis using the Beaver Valley Unit 2 Plant Specific Risk-informed notebook, and determined that this finding was of very low safety significance (Green). Specifically, with the application of Usage Rule 1.6 for an EDG finding from IMC 0609, Appendix A, the loss of offsite power (LOOP) and LOOP with loss of one AC bus (LEAC) initiating event worksheets were evaluated regarding this finding dealing with the EDG ventilation support system. Major assumptions for this analysis included: (1) the exposure time was between 3 and 30 days, (2) the initiating event frequency for LOOP was 3 (based on the 3-30 day exposure time), (3) the effect on EDG 2-2 reduced the redundancy of the EAC safety function from 3 to 2 on the LOOP worksheet and increased the LEAC initiating event frequency from 5 to 3 (based on 3-30 days), and (4) an operator recovery factor of 1 was applied to all affected sequences, based on the greater than 4 hours for operators to respond, the existence of room high temperature alarm response procedures, and the demonstrated ability to take corrective actions to restore the ventilation.

Using the counting rule, the issue represented a low E-7 increase in core damage frequency over the 14-day period of total unavailability time. The dominant core damage sequences were: (1) a LOOP with failure of the remaining EDG, leading to a

station blackout, with subsequent failure of the turbine-driven auxiliary feedwater (AFW) pump, and inability to recover offsite power prior to core damage; (2) a LOOP with an assumed failure of EDG 2-2, which causes one motor-driven AFW pump and one quench spray train to be inoperable due to loss of power; and (3) an LEAC with the failure of the PORVs to close and the loss of one train of the quench spray system. During the 14-day period, the offsite power system was fully capable, and all other equipment required to perform a safety function, with the exception of the 2-2 EDG, were operable. The Region I SRA reviewed FENOC's IPEEE and determined that external events did not contribute sufficiently to increase the significance of the finding. Further, because Beaver Valley Unit 2 has a large, sub-atmospheric containment, LERF was not an issue for this finding.

This finding was related to the Problem Identification and Resolution Cross-Cutting area, in that inadequate problem resolution led to the tripping of the EDG supply fan which rendered the 2-2 EDG out of service.

Enforcement. The inspectors identified a non-cited violation (NCV) of 10 CFR 50 Appendix B, Criteria XVI, "Corrective Action." Specifically, 10 CFR 50 Appendix B, Criteria XVI requires, in part, that measures are established to ensure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, FENOC failed to adequately address recurrent problems with emergency diesel generator ventilation temperature switches, and ultimately resulted in the inoperability of the 2-2 emergency diesel generator. Because this violation was of very low safety significance and Beaver Valley entered this finding into its corrective action program as CR 04-03672, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. (NCV 05000334/2004-004-01, Inadequate Corrective Action Associated with Emergency Diesel Generator Ventilation System Failures).

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 against criteria contained in 10 CFR 50.65(a)(4); 1/2-ADM-2033, "Risk Management Program," Rev. 2; NOP-WM-2001, "Work Management Process," Rev. 2; 1/2-ADM-0804, "On-Line Work Management and Risk Assessment," Rev. 3; 1/2-ADM-2114, "Maintenance Rule Program Administrative Procedure," Rev. 0; and Conduct of Operations Procedure 1/2OM-48.1.I, "Technical Specification Compliance," Rev. 13. The inspectors reviewed the planned or emergent work for the following activities:

- On April 14, 2004, the inspectors reviewed the licensee's risk assessment associated with the performance of a planned outage on the 2-1 EDG. This maintenance outage included various preventive maintenance activities, hose replacements as well as replacement of a vacuum breaker.

- On April 28, 2004, the inspectors reviewed the licensee's risk assessment associated with the emergent failure of a threaded plug on the Unit 1 'A' LHSI pump. This maintenance activity involved replacing four carbon steel plugs located on the casing of the pump.
- On April 30, 2004, the inspectors reviewed the licensee's risk assessment associated with the emergent failure of the 2-2 EDG. The ventilation system is a vital subsystem to the EDG and its failure renders the EDG out of service and unavailable. This emergent activity increased the maintenance risk threshold from green (<2 times baseline) to yellow (2 to 10 times baseline CDF).
- On June 14, 2004, the inspectors reviewed the licensee's risk assessment associated with the performance of a planned, uncoupled test run of the Unit 1 'B' Reactor Plant River Water pump following an upper motor bearing replacement. The test rendered the 'B' and 'C' River Water pumps unavailable, increasing the risk from green (<2 times baseline) to yellow (2 to 10 times baseline CDF).
- The inspectors reviewed the licensee's risk assessment associated with the unavailability of the Unit 2 'B' Standby Service Water Pump due to high vibration readings on the motor outboard horizontal and vertical bearings which occurred on April 29, 2004.
- On June 29, 2004, the inspectors reviewed the licensee's risk assessment associated with the planned unavailability of the Unit 1 No. 1 Emergency Diesel Generator due to the replacement of MCC breaker, 480V MCC-1-E7-E, Supply to the Diesel Generator Building No. 1 Exhaust Fan VS-F-22A

b. Findings

Introduction. A Green NCV was identified for failure to correct a condition adverse to quality associated with the Unit 1 LHSI system as prescribed in 10 CFR 50, Appendix B, Section XVI, "Corrective Action."

Description. On April 27, 2004, the Unit 1 control room received annunciator A6-20, "Refueling Water Storage Tank (RWST) Below Normal Level." A review of the RWST level indication indicated a declining trend, and operators were dispatched to perform searches for active leaks. During this search, standing water was noted in the 'A' low head safety injection (LHSI) pump cubicle, and water was observed leaking from a plug hole in the pump casing. Based on this report, the 'A' LHSI pump was placed in pull-to-lock, isolated, and associated Technical Specification 3.5.2 was entered. Based on a review of level trends, FENOC estimated the total RWST leakage to be 500 gallons. FENOC determined that the ejected plug material was carbon steel, and attribute the failure mechanism to galvanic corrosion due to the dissimilar metal of the plug (carbon steel) and the pump suction base (stainless steel). FENOC replaced the four carbon steel plugs on the pump with stainless steel plugs, and the pump was declared operable on April 29, and exiting the 72-hour TS LCO.

Extent of condition reviews revealed additional carbon steel plugs on a total of four safety-related pumps ('A' and 'B' re-circulation spray and LHSI pumps). However, these plugs were deemed to be tell-tail drains on the annular region between a double O-ring arrangement of the pump flange. These carbon steel plugs would only see system pressure following failure of the inner O-ring. An operability determination was written to document the acceptability of this condition.

The inspectors noted that FENOC had previously generated three CRs that documented this issue of leaking plugs on the 1A LHSI pump. The first was discovered on July 27, 2003, during the performance of 1OST-48.02, "High Energy Line and ECCS Inspection," Rev. 8, where dry boric acid was noted on a small plug on the 1A LHSI pump, in CR-08227. The boric acid was cleaned and an as-left inspection was performed. No external degradation was noted. No further action was prescribed by the CR. The second discovery was on September 29, 2003, following performance of 1OST-11.1, where boric acid was again noted on this same plug on 'A' LHSI pump, and documented in CR 03-10185. Finally on November 24, 2003, the same leaking plug was identified during the quarterly performance of 1OST-48.02. The corrective action noted that a work order had been generated to ultimately fix the leak. The short term corrective action was to continue to monitor the leakage.

Analysis. The inspectors determined that this issue involved a performance deficiency since three separate condition reports noted boric acid leakage past these carbon steel plugs prior to this event but little action was taken to correct the condition, leading to the unavailability of the 'A' LHSI pump and draining of the RWST. The corrective actions focused on continued monitoring and failed to consider the consequences of wastage of these carbon steel plugs. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's ability to perform its regulatory function and was not the result of any willful violation of NRC requirements or FENOC procedures.

This finding is considered more than minor since it is similar to the example in App E, Sec 4, 'Insignificant Procedural Errors,' example 'f', of Manual Chapter 0612, where a failure to implement a corrective action had a safety impact in that a component important to safety was rendered out of service.

The inspectors determined the finding was of very low safety significance (Green) using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." The inspectors used a Phase 1 analysis to determine that the finding did not affect fire protection or a shutdown reactor and only affected the Mitigating Systems cornerstone. The finding did result in a loss of function of a single train since the pump was rendered inoperable, but did not represent an actual loss of a safety function of an entire system. A subsequent engineering analysis determined that the ejected plug would cause a 2 cubic feet per minute air leak into the suction of the pump, and that the air inleakage would not affect the ultimate function of the pump. Since the pump was rendered out of service to affect repairs for a duration less than its allowable outage time of 72 hours, a phase 2 SDP analysis was not required and the finding was screened to Green. This finding was related to the Problem Identification

and Resolution Cross-Cutting area, in that inadequate problem resolution led to the ultimate plug failure which rendered the 'A' LHSI pump out of service.

Enforcement. The inspectors identified an NCV of 10 CFR 50 Appendix B, Criteria XVI, "Corrective Action." Specifically, three separate CRs issued between July 2003 and November 2003 identified boric acid leakage near the base of the 'A' LHSI pump. The leakage was allowed to continue until April 27, 2004, when one of the four carbon steel plugs failed and caused an RWST level loss until the pump was isolated and declared inoperable. The underlying root cause was inadequate corrective action associated with the ongoing boric acid leakage on the 'A' LHSI pump. 10 CFR 50 Appendix B, Criteria XVI requires the licensee to establish measures to assure that conditions adverse to quality be promptly identified and corrected. Contrary to the above, FENOC failed to repair a leaking plug in the 'A' LHSI pump despite being identified in three separate CRs from July to November of 2003. As a result, on April 27 the plug failed, resulting in the inoperable '1A' LHSI pump, as well as the loss of 450 gallons of boric acid water from the RWST. Because this violation was of very low safety significance and FENOC entered this finding into the corrective action program (CR 04-03642), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. (NCV 05000334/2004-004-02, Inadequate Corrective Action Associated with a Boric Acid Leak on the Unit 1 'A' LHSI Pump).

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14 - 2 sample)

a. Inspection Scope

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

- The inspectors evaluated the licensee's response to unexpected, automatic control rod insertion events that occurred at Unit 2, on April 18 & 29, 2004, that were later determined to be caused by circuit card calibration drift. The inspectors reviewed shift narrative logs, technical specifications (for compliance and operability concerns), alarm response procedures, system health reports, and the associated Problem Solving Plan for the event to verify, appropriate actions were taken. The inspector assessed the adequacy of FENOC's short and long-term corrective actions as detailed in CRs 04-03674 and 04-03361. In addition, because the April 18 rod insertion event of 1-1/2 steps had gone unnoticed by the control room operators for a period of 7 hours, the inspector evaluated the TS implications, and determined that the surveillance was appropriately completed within the allotted time for the applicable surveillance.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 6 samples)a. Inspection Scope

The inspectors reviewed the following six conditions to determine whether proper operability determinations (OD), Basis For Continued Operations (BCO), or applicable assessments were performed. In addition, where applicable, the inspectors verified that Technical Specification (TS) limiting conditions for operation (LCO) requirements were properly addressed.

- The inspectors reviewed an OD associated with the Unit 1 'A' LHSI pump, as documented in CR 04-03642, regarding the failure of a pump casing plug on April 27, 2004. The inspectors assessed the adequacy and acceptability of FENOC's conclusion in the OD, which was expanded to include the 'B' LHSI pump as well as the 'A' and 'B' recirculation spray pumps, that the four pumps would continue to perform their design basis functions. The inspectors evaluated the contingency actions, which included periodic leakage monitoring of the plugs and a planned replacement during the next refueling outage.
- The inspectors reviewed operability aspects involving the Unit 2 'A' Emergency Diesel Generator (EDG) supply fan auxiliary relay, 3-HVDAA, documented in CR-04-03210. The inspectors reviewed the adequacy of FENOC's response as they evaluated whether periodic testing of these relays was required or necessary, since none was initially identified.
- The inspectors reviewed an OD associated with a pinhole leak identified on the "A" service water header, and documented in CR-04-03877. The inspectors evaluated the adequacy of the OD, and the acceptability of the conclusion that the system remained operable. In addition, the inspectors reviewed the technical justifications that supported the operability conclusion, which included compliance with applicable ASME Boiler and Pressure Vessel Codes, and reviewed the corrective actions implemented as a result of the leak.
- The inspectors reviewed an OD associated with a cracked weld identified on ductwork in the supplemental leak collection and release system (SLCRS), and documented in CR-04-03273. The inspectors evaluated the OD to ensure the impact of the cracked weld on SLCRS was adequately evaluated and addressed, considering that the crack allowed unfiltered air into the downstream portion of the SLCRS system.
- The inspectors reviewed a condition regarding the Unit 1 control room emergency ventilation system (CREVS), documented in CR-04-04124, which detailed specific system operational changes had been implemented that were inconsistent with the Unit 1 CREVS design basis. Specifically, the inspector reviewed FENOC's evaluation regarding the impact of control room purge

operations that would have resulted in an increase in post-accident dose for control room operators following the design basis main steam line break. This was determined to be a licensee-identified violation (Green). (See Section 40A7)

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds (Cumulative Review) (71111.16 - 1 Sample)

a. Inspection Scope

The inspectors reviewed the current listing of active Operator Work-Arounds (OWAs) for Beaver Valley 1, which also included Operator Challenges and Control Room Deficiencies. The review was conducted to verify that cumulative effects of known OWAs were evaluated to determine the overall impact on the affected systems. While the current listing contained zero OWAs, the inspectors assessed the cumulative impact of overall deficiencies and challenges to control room operators to determine if it adversely affected the ability of plant operators to implement emergency procedures or respond to plant transients. The inspectors reviewed the deficiencies and challenges and verified that they were being captured for resolution, and reviewed the guidance contained in BVBP-OPS-0002, Rev. 9, "Operator Work Arounds, Operator Challenges, and Control Room Deficiencies."

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17 - 1 sample)

a. Inspection Scope

The inspectors evaluated the design basis impact of a permanent modification to the automatic rod control system at Unit 1, due to the presence of signal noise that had caused spurious rod movement while in automatic mode of operation during steady-state power operations. The modification installed a filtering and rescaling module in the suspect nuclear instrumentation circuit that inputs into the rod control system, effectively removing the automatic rod withdrawal capability. The inspector (1) reviewed the design adequacy of Engineering Change Package 03-051823, (2) reviewed operational impacts and controls during implementation, (3) reviewed the adequacy of post-modification testing, and (4) reviewed the resulting procedural changes.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 6 samples)

a. Inspection Scope

The inspectors reviewed and/or observed six post-maintenance tests (PMTs) to ensure: 1) the PMT was appropriate for the scope of the maintenance work completed; 2) the acceptance criteria were clear and demonstrated operability of the component; and 3) the PMT was performed in accordance with applicable procedures. The following PMTs were observed:

- 2OM-36.4.AG, "Emergency Diesel Generator [2EGS*EG2-2] Start-up and Shutdown," Rev. 10, performed on April 30, 2004, following the jumpering of the EDG ventilation temperature switches which were causing spurious trips of the ventilation system.
- 1PMP-E-37-011, "General Electric Low Voltage Circuit Breaker Inspection and Test Model AK-3A & 7A-25," Rev. 8, performed on March 18, 2004, following the trip setpoint adjustment of the 480 circuit breakers associated with the Unit 1 switchgear ventilation fans F-17 and F-18. The refurbished trip units and breakers were installed on April 01 and the fans were tested satisfactorily.
- 1OST-47.3F, "Containment Isolation and ASME Section XI Test - Work Week 2," Rev 3, performed on April 27, following replacement of the breaker associated with valve, MOV-SI-862B.
- WO 200022571, utilized to perform the PMT of a manual isolation valve located in the 2-1 EDG cooling water system on April 13, 2004. This WO replaced a previously installed vacuum breaker which had exhibited excessive leakage.
- 1OST-30.3, "Reactor Plant River Water Pump 1B [1-WR-P-1B] Test," Rev. 34, performed on June 12, 2004, following replacement of the upper motor bearing assembly under WO 200098172.
- 1OST-11.1, "Safety Injection Pump Test - [1SI-P-1A]," Rev. 17, performed on April 29, 2004, following replacement of pump casing plugs, under WO 200075953.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 samples)

a. Inspection Scope

The inspectors observed and/or reviewed the following five OSTs. This review verified that the equipment or systems were capable of performing their intended safety functions and to ensure compliance with related TS, UFSAR, and procedural requirements:

- 1OST-7.5, Rev. 29 Centrifugal Charging Pump Test [1CH-P-1B]
- 1OST-47.3G, Rev. 1 Containment Isolation and ASME Section XI Test - Work Week 3
- 2OST-24.4, Rev. 49 Steam Driven Auxiliary Feed Pump [2FWE*P22] Quarterly Test
- 1MSP-1.05-I, Rev. 24 Solid State Protection System Train 'B' Bi-Monthly Test
- 1MSP-36.82-E, Iss 4, Rev. 5 Functional Test of 1DF 4KV Emergency Bus Loss of Voltage Relay [27-VF-100] and Diesel Start Loss of Voltage Relay [27-VF1100]

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 2 samples)

a. Inspection Scope

The inspectors selected two temporary modifications (TM) for review based on risk significance. The TMs and associated 10 CFR 50.59 screenings were reviewed against the system design and licensing basis documentation, including the UFSAR and the TS. The inspectors verified the TM was implemented in accordance with Administrative (ADM) Procedure, 1/2-ADM-2028, "Temporary Modifications," Rev. 3.

- The inspectors reviewed the Unit 1 TM 1-03-013, Rev. 0, "PCV-1MS-106A I/P Pneumatic Jumper." This TM rerouted the control air signal from the steam dump valve, PCV-1MS-106A to another valve, TCV-1MS-106A8. PCV-1MS-106A is the first valve to open under the steam dump control logic circuitry and also is one of the three cooldown valves. This valve had exhibited previous erratic operation and TCV-106A8 was selected to operate in its stead with the exception of the cooldown feature. TCV-106A8 is located in the same bank as PCV-1MS-106A. The air was isolated from PCV-1MS-106A and the valve was removed from service. The inspectors also reviewed a setpoint evaluation, dated May 2, 2003, which concluded that there was no impact on the Turbine Trip/Reactor Trip (P9) setpoint with one steam dump valve out of service.
- The inspectors reviewed the Unit 2 TM 2-04-011, Rev. 0, "Bypass of Unit 2 'B' Diesel Generator Ventilation Temperature Switches 2HVD-TS-121A, B, C, D." Spurious trips on the 'B' EDG room ventilation fan during a monthly EDG performance run was attributed to failed temperature switch circuit boards. These temperature switches function to sense high temperature in anticipation of a fire and stop the fans before a CO2 actuation occurs. This TM jumpered out

Enclosure

all four temperature switches to preclude further trips of the EDG room ventilation. Compensatory measures included an hourly fire watch.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 - 2 samples)

1. Simulator-Based Evaluation

a. Inspection Scope

The inspectors observed a Unit 2 operator requalification simulator evaluation, (See Section 1R11), and evaluated operator performance regarding event classifications. The simulator evaluation involved multiple safety-related component failures and plant conditions that warranted a simulated Alert emergency event declaration. The licensee counted this evolution toward Emergency Preparedness Drill/Exercise Performance (DEP) Indicators, therefore, the inspectors reviewed the classifications to determine whether they were appropriately credited. Additionally, the inspectors verified the DEP performance indicators were properly evaluated consistent with Nuclear Energy Institute (NEI) 99-02, Rev. 2, "Regulatory Assessment Performance Indicator Guideline." Other documents utilized in this inspection include the following:

- 1/2-ADM-1111, Rev. 1 NRC EPP Performance Indicator Instructions
- EPP/I-1a, Rev. 7 Recognition and Classification of Emergency Conditions
- EPP-I-3, Rev. 18 Alert

b. Findings

No findings of significance were identified.

2. Annual Drill Evaluation

a. Inspection Scope

On April 7, 2004, the inspectors evaluated FENOC's performance during an emergency preparedness drill. The drill exercised the capability of the facility to respond to a loss of all vital AC power on Unit 2. The inspectors analyzed participant performance at the technical support center and the Unit 2 simulator control room. The inspectors evaluated the opportunities for emergency action level classification and notification presented in the drill scenario. The inspectors verified FENOC correctly evaluated the drill participants' notifications in accordance with FENOC's emergency plan

implementing documents. The inspectors also evaluated the licensee's critique of the drill.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation (71122.02 - 6 samples)

a. Inspection Scope

During the period April 27 - 30, 2004, the inspector conducted the following activities to verify that the licensee's radioactive material processing and transportation programs complied with the requirements of 10 CFR 20, 61, and 71; and Department of Transportation (DOT) regulations contained in 49 CFR 170-189.

Radioactive Waste System Walkdown

The inspector walked down accessible portions of the Unit 1 and Unit 2 radioactive liquid and solid waste collection/processing systems with the site Radiation Protection Supervisor in charge of radwaste processing/shipping. The inspector evaluated if the systems and facilities were consistent with the descriptions contained in the Updated Final Safety Analysis Report (UFSAR) and Process Control Program (PCP), evaluated the general material conditions of the systems and facilities, and identified any changes to the systems. Also, radwaste storage areas located within the Unit 1 and Unit 2 protected area, as well as the switchyard, were visually inspected.

The inspector discussed with the RadWaste Operations Supervisor the status of non-operational, retired-in-place, radioactive waste processing equipment, and the administrative and physical controls for various components in these systems. The inspector evaluated any recent changes made to radwaste processing systems and the potential radiological impact, and reviewed the current processes for transferring radioactive resin and sludge to shipping containers and subsequent resin dewatering.

Waste Characterization and Classification

The inspection included a selective review of the waste characterization and classification program for regulatory compliance, including:

- the radio-chemical sample analysis results for various radioactive waste streams, including spent resins, dry active waste, and mechanical filters

- the development of scaling factors for hard-to-detect radionuclides
- methods and practices to detect changes in waste streams
- classification and characterization of waste relative to 10 CFR 61.55 and to determine DOT shipment subtype per 49 CFR 173

Shipment Preparation

The inspection included a review of radioactive waste program documents, shipment preparation procedures, and in-progress activities for regulatory compliance, including:

- an observation of technicians obtaining a resin sample (for analysis) from a waste disposal liner following sluicing of spent resin from a Unit 1 processing system LW-I-2-3, on April 28, 2004
- review of radioactive material shipping logs for the calendar years 2003 and 2004
- review of certificates-of-compliance for in-use shipping casks
- verification of appropriate NRC (or agreement state) license authorization for shipment recipients for five recent shipments listed in the shipping records section
- verification that training was provided to appropriate personnel responsible for classifying, handling and shipping radioactive materials, in accordance with NRC Bulletin 79-19, and 49 CFR 172 Subpart H, during a meeting with training personnel on April 29, 2004

Shipping Records

The inspector selected and reviewed records associated with five (5) non-excepted shipments of radioactive materials made during calendar year 2004. The shipments were Nos. 3123, 3128, 3129, 3130, and 3133. The following aspects of the radioactive waste packaging and shipping activities were reviewed:

- implementation of applicable shipping requirements including proper completion of manifests
- implementation of specifications in applicable certificates-of-compliance, for the approved shipping casks including limits on package contents
- classification of radioactive materials relative to 10 CFR 61.55 and 49 CFR 173
- labeling of containers

- radiation and contamination survey of packages
- placarding of transport vehicles
- conduct of vehicle checks
- providing of driver emergency instructions
- completion of shipping papers

On April 28, 2004, the inspector verified that the 24-hour emergency response contact telephone number contained in the shipping manifests was a working number by calling the Unit 1 Nuclear Shift Supervisor.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program (REMP) (71122.03)

a. Inspection Scope (9 Samples)

The inspector performed the following reviews:

- reviewed the most current Annual Environmental Monitoring Report and licensee assessment results, to verify that the REMP was implemented as required by TS and the ODCM.
- reviewed the adequacy and acceptability of changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data.
- reviewed licensee self-assessments, audits, licensee event reports, and inter-laboratory comparison program results.
- reviewed the FSAR for information regarding the environmental monitoring program and meteorological monitoring instrumentation.
- reviewed the scope of the licensee's audit program to verify that it meets the requirements of 10 CFR 20.1101(c).

The inspector performed walkdowns of the following areas, to determine if the locations were located as described in the ODCM, and to evaluate the acceptability of the material condition of the equipment; additionally, the inspector observed the collection and preparation of a variety of environmental samples, and verified that environmental

sampling was representative of the release pathways as specified in the ODCM, and that sampling techniques were in accordance with procedures :

- five (of 10) air sampling stations;
- five (of 6) milk collection stations;
- three (of 3) surface water sampling stations;
- two (of 2) drinking water sampling stations;
- one (of 3) precipitation sampling stations;
- 17 (of 44) thermoluminescence dosimeter (TLD) monitoring stations.

Based on direct observation and review of records, the inspector verified that the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the FSAR, NRC Safety Guide 23, and licensee procedures. The inspector verified that the meteorological data readout and recording instruments in the control room and at the tower were operable.

The inspector reviewed the cause and corrective actions for each event documented in the Annual Environmental Monitoring Report, which included a missed sample, an inoperable sampler, a lost TLD, or anomalous measurements. The inspector also reviewed the licensee's assessment of any positive sample results.

The inspector reviewed the calibration and maintenance records for 10 air samplers and composite water samplers. This review also included activities regarding the inter-laboratory comparison program:

- Results of the licensee's contractor inter-laboratory comparison program, to verify the adequacy of environmental sample analyses performed by the licensee's contractor;
- FENOC's quality control evaluation of the inter-laboratory comparison program and the corrective actions for any deficiencies;
- FENOC's determination of any bias to the data and the overall effect on the REMP;
- QA audit results of the program to determine whether the licensee met the TS/ODCM requirements (Quality Field Observations BV 320031343 and BV 32003967; Nuclear Quality Assessment Report BV-C-03-02; Audit BV-C-01-12); and
- The inspector verified that the appropriate detection sensitivities with respect to TS/ODCM are utilized for counting samples and reviewed the results of the vendor's quality control program, including the inter-laboratory comparison program to verify the adequacy of the vendor's program.

The inspector observed several locations where the licensee monitors potentially contaminated material leaving the RCA, and inspected the methods used for control,

survey, and release from these areas. The inspector also observed personnel surveying and releasing material for unrestricted use, and verified that the work was performed in accordance with plant procedures.

The inspector verified that the radiation monitoring instrumentation was appropriate for the radiation types present and was calibrated with appropriate radiation sources. The inspector reviewed the licensee's criteria for the survey and release of potentially contaminated material; verified that there was guidance on how to respond to an alarm which indicates the presence of licensed radioactive material; and reviewed the licensee's equipment to ensure the radiation detection sensitivities are consistent with the NRC guidance contained in IE Circular 81-07 and IE Information Notice 85-92 for surface contamination, as well as HPPOS-221, for volumetrically contaminated material. The inspector also reviewed the licensee's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters, and verified that the licensee has not established a "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high radiation background area.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (711151 - 8 samples)

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the period from May 2003 through May 2004, for both units. PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 2 were used to verify the basis reporting for each data element.

Reactor Safety Cornerstone

- Safety System Unavailability (AFW)
- Safety System Unavailability (HHSI)
- Safety System Unavailability (EDGs)
- Unplanned Power Changes per 7000 Hours

The inspectors reviewed portions of Unit 1 and Unit 2 operator log entries, daily morning reports (including the daily CR descriptions), the monthly operating reports, and PI data sheets to determine whether the licensee accurately reported the unavailability hours associated with the AFW, HHSI and EDG safety systems. In addition, the inspectors interviewed personnel associated with the PI data collection, evaluation, and distribution.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

1. Annual Sample Review (2 samples)

CR-03-08668 - 2CHS-P21B High Gearbox Vibrations

a. Inspection Scope and Observations

The inspectors selected CR 03-08668 for detailed review. The CR, generated in August 2003, detailed a concern regarding higher than normal gearbox vibrations identified on the Unit 2 "B" Charging pump. These vibrations were identified a few months following the replacement of gears in June 2003. The inspector reviewed the adequacy and appropriateness of FENOC's actions detailed in the corrective action program for this issue, and verified their actions were appropriate. Specifically, the inspector reviewed the extensive analysis performed by FENOC, which included, for example, a problem solving plan implemented in accordance with NOP-ER-3001, "Problem Solving and Decision Making." The problem solving plan included a Failure Mode Analysis that evaluated the possible causes of the elevated vibration to determine the most likely cause and/or contributing cause. The inspector assessed the identified corrective actions implemented to prevent recurrence, which included remedial and other actions based on FENOC's investigation results, to determine the adequacy and appropriateness of the corrective actions. In addition, the inspector evaluated the acceptability of the most likely cause of the elevated vibrations identified during FENOC's investigation, which was determined to be the installation of mismatched high speed and low speed gear assemblies manufactured approximately 10 years apart.

b. Findings

No findings of significance were identified.

CR-03-09448 - EDG 2-1 Auto Load Test Results

a. Inspection Scope and Observations

The inspectors identified condition report (CR) 03-09448 for detailed review. The CR was issued following the failure of the Unit 2 emergency diesel generator (EDG) 2-1 output breaker to close within 10 seconds, as required by Technical Specifications, during the performance of surveillance test procedure 2OST-36.3.

The inspectors reviewed the circumstances surrounding the event, including FENOC's apparent and root cause evaluation for the event. The inspectors verified that the corrective actions were: (1) reasonable and commensurate with the significance of the issue, (2) contained appropriate actions to prevent recurrence, (3) adequately supported

by FENOC's analyses, and (4) timely and effectively implemented. The inspectors also evaluated the adequacy of FENOC's extent of condition and generic implication reviews. Applicable records, including maintenance and test activities were reviewed, as necessary.

b. Findings

On September 14, 2003, during a Unit 2 refueling outage surveillance test of the 2-1 EDG, a starting time of 11.8 seconds was achieved, exceeding the acceptance criteria of ≤ 10 seconds contained in Section 4.8.1.1.2.b.3 of the plant Technical Specifications. FENOC's investigation concluded that EDG failure to start within the required TS acceptance criteria resulted from the "early" actuation of EDG control relay 53. The purpose of relay 53 is to monitor the EDG output voltage and, when this voltage has reached an appropriate level, changes state to stop flashing the generator field. Following their investigation, FENOC replaced relay 53 with a new one and conducted three post-maintenance tests to verify operability of the EDG. Each time, the EDG starting time was less than the required 10 seconds.

The inspectors concluded that FENOC conducted an appropriate investigation of the event, which included the causes that led to the failure. The inspectors, however, also concluded that FENOC's resolution of the issue and corrective actions were only marginally acceptable, for the following reasons:

- To assure proper build-up of the EDG output voltage, field flashing must be maintained until the EDG becomes self-excited. Therefore, Relay 53, which monitors this voltage and locks out field flashing, should have a minimum voltage pick-up setting. However, this relay had only a maximum voltage pick-up, hence neither the minimum set-point nor its repeatability could be guaranteed. This fact was also pointed out to the licensee by the relay manufacturer, as well as by Beta Laboratories, during FENOC's investigation.
- Tests conducted by the licensee showed that the pick-up voltage of the replacement relay was only 4.2 Volts higher than that of the failed relay. Therefore, the new relay was only marginally better than the failed one. In addition, based on a manufacturer statement, the pick-up voltage degrades (lowers) with time.

As indicated previously, the post-maintenance tests performed by the licensee showed that the relay performed acceptably. In addition, FENOC indicated their intention to replace the voltage regulator cabinets of the Unit 2 EDGs with a different type during the next refueling outage, rendering the relay application concern no longer applicable (the Unit 1 cabinets were replaced previously). This issue is closed.

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

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

3. Daily Condition Report Review

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

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

Section 1R12 describes a finding for failure to correct a condition adverse to quality which rendered an EDG unavailable. This issue had been entered into the corrective action program, but FENOC did not take actions to correct the deficiency prior to the identified failure.

Section 1R13 describes a finding for failure to correct a condition adverse to quality which rendered an LHSI pump unavailable. This issue had been entered into the corrective action program, but FENOC did not take actions to correct the deficiency prior to the identified failure.

5. Radioactive Material Processing and Transportationa. Inspection Scope:

The inspector reviewed twenty (20) Condition Reports, two (2) Radiation Protection Department Self-Assessments, eleven (11) Quality Assessment Field Observations, and a Quality Control Inspection Report for shipment No. 3133, relating to radioactive material processing and shipment. Through this review, the inspector assessed the licensee's threshold for identifying problems, and the promptness and effectiveness of the resulting corrective actions. This review was conducted against the criteria contained in 10 CFR 20.1101(c), Technical Specifications, and the licensee's procedures.

b. Findings

No findings of significance were identified.

6. Radiological Environmental Monitoring Program (REMP)a. Inspection Scope (1 Sample)

The inspector reviewed the Licensee Event Reports, Special Reports, audits, and self-assessments related to the radiological environmental monitoring program performed since the last inspection. The inspector determined that identified problems were appropriately entered into the corrective action program for resolution. The inspector also reviewed corrective action reports related to environmental sampling, sample analysis, or meteorological monitoring instrumentation. Four condition reports (CR) related to the problems identified in the radiological environmental monitoring program (02-07970, 03-06920, 03-07052, and 03-07054) were reviewed.

b. Findings

No findings of significance were identified.

7. Semi-Annual Review of PI&R Trendsa. Inspection Scope (1 Sample)

The inspectors reviewed available processes for site trending to determine if trending was appropriately evaluated by FENOC. This review covered a newly instituted trending program to verify that existing trends were (1) appropriately captured and scoped, (2) consistent with the inspectors' assessment from the daily CR reviews (Section 40A2.3), and (3) not indicative of a more significant safety concern.

b. Observations and Findings

The inspectors reviewed the results of a recently instituted trending program, the Collective Condition Report Review Process. The review covered the entire First Quarter of 2004, was performed by 11 major site organizations/departments, and was designed to capture trends, as well as appropriately characterize and initiate corrective actions where deficiencies or trends are identified. The inspectors determined that, in general, appropriate trends were identified by applicable departments. However, the inspectors identified the following deficiencies:

- The “trending program” being implemented was not captured formally in procedures, yet required major department corrective action analysts to coordinate similar evaluations for input into an integrated review process.
- A maintenance trend review identified several maintenance & test equipment (M&TE) deficiencies, but failed to identify a trend based on insufficient data, a conclusion inconsistent with site data reviewed by inspectors, as well as site quality assurance personnel.

4OA3 Event Followup (71153 - 2 Samples)

1. (Closed) Licensee Event Reports (LER) 50-412/2003-002-00/01: Potential to Deadhead a Component Cooling Water System Pump Violates Safety Analyses Assumptions.

On June 11, 2003 and during subsequent evaluations, FENOC identified that component cooling water system (CCP) design considerations were not adequately evaluated for an impeller changeout implemented on the “B” CCP Pump in 1997. Specifically, the licensee identified that: (1) appropriate engineering analyses were not performed that would have identified hydraulic instabilities due to the installation of a hydraulically stronger impeller than the remaining two pumps; and (2) pump recirculation control valves normal system alignments (NSA) were changed from operating in automatic to manual, contrary to design assumptions, and had insufficient pressure control bands to address the hydraulic effects of the new impeller. These design control deficiencies were considered more than minor since they are associated with the Design Control Attributes of the Reactor Safety Mitigating System Cornerstone, and they impacted the reliability and capability of the CCP System from responding to Initiating events. However, since the CCP system is limited in its role insofar as it's relied upon to reach Mode 5 during cooldown events, this finding is not suitable for SDP evaluation, but was reviewed by NRC management and is determined to be of very low safety significance (Green). This licensee identified violation is documented in section 4OA7 of this report.

40A5 Other1. NRC Temporary Instruction (TI) 2515/156, "Offsite Power System Operational Readiness"a. Inspection Scope

During the inspection period, the inspectors implemented inspection requirements contained in TI 2515/156, "Offsite Power System Operational Readiness." The inspectors evaluated the readiness of offsite power systems associated with the Beaver Valley Power Station in accordance with 10 CFR 50 Appendix A, General Design Criterion 17; 10 CFR 50 Appendix B, Criterion XVI; Plant Technical Specifications associated with offsite power; 10 CFR 50.63; and 10 CFR 50.65(a)(4). Appropriate documentation was provided to NRC management, as required.

b. Findings

No findings of significance were identified.

2. (Closed) URI 0505000334/2003002-03: Methods To Credit Manual Operator Action For Continued AFW Equipment Availability.

The NRC detailed in IR 03-02, dated May 9, 2003, the generation of URI 50-336/03-02-03. This URI detailed NRC questions on the acceptability of crediting manual operator action in place of automatic features for safety-related auxiliary feedwater pumps. Further, the NRC questioned whether FENOC's position was consistent with the guidance contained in NEI 99-02, Rev. 2, "Regulatory Assessment Performance Indicator Guideline." FENOC subsequently submitted to the NRC a frequently asked question (FAQ) to resolve the acceptability of crediting manual operator action to restore AFW pump automatic start features during a calibration, if needed for accident mitigation. Following NRC review, FAQ No. 359 was posted and affirmed FENOC's interpretation of NEI 99-02 regarding the crediting of manual operator action; however, minor revisions were required for specific procedures to allow this credit to be realized. As a result, no violation of NRC requirements was identified and this URI is closed.

40A6 Management MeetingsExit Meeting Summary

The inspectors presented the inspection results to Mr. William Pearce and members of licensee management on July 23, 2003. The licensee acknowledged the findings presented.

Additionally, inspectors from Division of Reactor Safety, Region I performed interim exits on April 16, 2004 regarding the results of the radiological effluents and monitoring inspection, and on April 30, 2004, regarding a radwaste/transportation inspection.

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

Site Management Visit

From June 21-22, 2004, Mr. Hubert Miller - NRC Region I Administrator, Cornelius Holden - Director, NRR Project Directorate 1, Brian Holian - Deputy Director - Region I DRP, and Peter Eselgroth - Chief, Reactor Projects Branch 7, toured Beaver Valley Power Station and met with station personnel and senior management to review plant performance.

40A7 Licensee-Identified Violations

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

- 10 CFR 50, Appendix B, Criterion III, "Design Control," requires in part, that measures be established to assure that the design basis is correctly translated into procedures. Contrary to this requirement, 1/2OM-44A.4A.A, Post Control Room Habitability System Actuation/Recovery," was revised in a manner inconsistent with the Unit 1 Control Room Emergency Ventilation System design basis. Specifically, procedure changes would have caused Unit 1 control room purge operations to be handled by Unit 2 purge system equipment, which had much lower design flow rates, and would have resulted in a 6 percent increase in thyroid dose to control room operators during a design basis main steam line break. However, because the resultant thyroid dose did not result in an exceedance of regulatory threshold dose values, this violation is of very low safety significance and is being treated as an NCV. The safety significance was evaluated using the Appendix A of the NRC's Significant Determination Process in IMC-0609. Specifically, the inspectors determined that the issue only represented a degradation of the radiological barrier function provided by the control room. (Section 1R15). This event was entered into FENOC's corrective action system as CR 04-04124.
- 10 CFR 50, Appendix B, Criterion III, "Design Control," requires in part, that design control measures be established to assure that applicable regulatory requirements and design basis were correctly translated into specifications, procedures and instructions, and must provide for verifying the adequacy of the design. Contrary to the above, FENOC's design control measures failed to ensure that design changes performed on the component cooling water system (CCP), would continue to ensure the CCP system would be able to perform its design basis function. Specifically, that the installation of a hydraulically stronger impeller, coupled with the manual operation of pump recirculation valves, rendered the CCP pumps incapable of meeting their licensing and design basis

functions to attain cold shutdown. (Section 40A3.2). These events were entered into FENOC's corrective action system as CR 02-09606 and 03-07102.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Castagnacc, Supervisor RP Services-Rad Waste/Shipping/Environmental
T. Cosgrove, Director, Plant Engineering
A. Crella, Area and Work Control Supervisor
R. Dibler, Supervisor, Access Authorization
R. Dinello, Environmental, Inc.
J. Dobo, Senior RP Technician
M. Duranko, Meteorological Monitoring Engineer
R. Ferrie, Plant Engineer
L. Freeland, Manager, Nuclear Regulatory Affairs & Corrective Actions
R. Freund, Supervisor RP Services-Technical Support
J. Gagliano, Supervisor Nuclear Security
D. Gallagher, RP Supervisor-Procedures
K. Halliday, Security Manager
M. Helms, RP Specialist-RMS/DRMS
V. Kaminskas, Director, Maintenance
J. Lash, Plant General Manager
J. Lebda, Supervisor, Radiological Engineering and Health
A. Lonnet, RP Specialist-Effluents
R. Mende, Director, Work Management
R. Moore, RP Specialist-Effluents
H. Mulcahy, Radiological Environmental Engineer
B. Murtaugh, Plant Engineer
W. Pearce, Vice President
P. Sena, Manager, Nuclear Operations
J. Sipp, Manager, Nuclear Radiation Protection, Rad Ops, Units 1 and 2
D. Weitz, Senior RP Specialist-RWP/ALARA
J. West, Plant Engineer
S. Wright, Security Operations Supervisor

NRC Personnel

P. Cataldo, Senior Resident Inspector
G. Smith, Resident Inspector
J. Furia, Senior Health Physicist
T. Moslak, Health Physicist

LIST OF ITEMS, OPENED, CLOSED, AND DISCUSSED

Open/Closed

05000334/2004004-01	NCV	Inadequate Corrective Action Associated with Emergency Diesel Generator Ventilation System Failures (Section 1R12)
05000334/2004004-02	NCV	Inadequate Corrective Action Associated with a Boric Acid Leak on the Unit 1 'A' LHSI Pump (Section 1R13)

Closed

05000412/2003002-00/01	LER	Potential to Deadhead a Component Cooling Water System Pump Violates Safety Analyses Assumptions (Section 40A3)
05000334/2003002-03	URI	Methods To Credit Manual Operator Action For Continued AFW Equipment Availability (Section 40A5)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignments

Drawings

- Unit 1 Operating Manual (OM) Figure Number 30-1, "River Water System Valve Oper No Diagram," Rev. 20
- Unit 1 OM Figure Number 30-2, "River Water System Piping and Instrumentation Diagram," Rev. 15
- Unit 1 OM Figure Number 30-3, "River Water System Valve Oper No Diagram," Rev. 12

Procedures

- 1OST-30.13A, "RP River Water System "A" Header Valve Position Verification," Rev. 20
- 1OM-30.2.A, "RP River Water System Precautions and Limitations," Rev. 7
- 1OM-30.3.A, "RP River Water System and Component Arrangement," Rev. 8

Section 1R05: Fire Protection

- BVPS Unit 2, Fire Protection Safe Shutdown Report, Addendum 25

Section 40A1: Other

- BVPS Security IDS/CCTV Performance Indicator Report - 1st Quarter 2003 through 1st Quarter 2004.
- BVPS Fitness For Duty Semi-Annual Performance Data Reports for 1st Quarter 2003 through 4th Quarter 2003.

LIST OF ACRONYMS

°F	Degrees Fahrenheit
AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Achievable
BVPS	Beaver Valley Power Station
CAP	Corrective Action Program
CCP	Component Cooling Water System
CFR	Code of Federal Regulations
CR	Condition Report
CREVS	Control Room Emergency Ventilation System
DEP	Drill/Exercise Performance
DOT	Department of Transportation
EDG	Emergency Diesel Generator
FAQ	Frequently Asked Questions
FENOC	First Energy Nuclear Operating Company
HHSI	High Head Safety Injection
IMC	Inspection Manual Chapter
LER	Licensee Event Report
LCO	Limiting Condition for Operation
LHSI	Low Head Safety Injection
LEAC	Loss of Offsite Power with Loss of One AC
LOOP	Loss of Offsite Power
M&TE	Maintenance & Test Equipment
MR	Maintenance Rule
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NSA	Normal System Alignments
OD	Operability Determinations
ODCM	Offsite Dose Calculation Manual
OM	Operating Manual
OWA	Operator Work-Around
PI	Performance Indicator
PCP	Process Control Program
PMT	Post-Maintenance Test
QA	Quality Assurance
RCA	Radiologically-Controlled Area
REMP	Radiological Environmental Monitoring Program

RPRW	Reactor Plant River Water
RWST	Refueling Water Storage Tank
SDP	Significance Determination Process
SLCRS	Supplemental Leak Collection and Release System
SSC	System, Structure, and Component
TI	Temporary Instruction
TLD	Thermoluminescent dosimeter
TM	Temporary Modification
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WO	Work Order