January 31, 2005

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 05000334/2004006 AND 05000412/2004006

Dear Mr. Pearce:

On December 31, 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 January 21, 2005, with you and other members of your staff.

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

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

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room). We appreciate your cooperation. Please contact me at 610-337-5234 if you have any questions regarding this letter.

Sincerely,

/RA/

Peter W. 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 05000334/2004006; 05000412/2004006
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.	05000334/2004006 and 05000412/2004006
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:	October 01, 2004 - December 31, 2004
Inspectors:	T. Burns, Reactor Inspector P. Cataldo, Senior Resident Inspector T. Fish, Sr. Operations Engineer T. Moslak, Health Physicist D. Silk, Senior Emergency Preparedness Inspector G. Smith, Resident Inspector B. Welling, Senior Reactor Inspector M. Modes, Senior Reactor Inspector
Approved by:	Peter W. Eselgroth, Chief Reactor Projects Branch 7 Division of Reactor Projects

Enclosure

CONTENTS

SUMMARY OF FINDINGS

IR 05000334/2004006, IR 05000412/2004006; 10/01/2004 - 12/31/2004; Beaver Valley Power Station, Units 1 & 2; Maintenance Rule Implementation and Operability Evaluations.

The report covered a 3-month period of inspection by resident inspectors, a team inspection consisting of four regional inspectors, announced inspections by a regional health physics inspector and two senior reactor inspector during the Unit 1 refueling outage, and in-office reviews by a senior operations engineer and a senior emergency preparedness inspector.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of the Unit 1 facility operating license, Section 2.C.5, "Fire Protection Program" for not adequately correcting repetitive failures of the Emergency Response Facility (ERF) Emergency Diesel Generator (EDG). The ERF EDG provides emergency power to the 'dedicated' Auxiliary Feedwater (AFW) pump which is required by the Unit 1 Updated Fire Protection Appendix 'R' Review, Rev. 25, due to the lack of fire train separation of the three safety-related Unit 1 AFW pumps.

  The finding is greater than minor because it adversely affected the availability of a fire protection program component and mitigating systems cornerstone objective. The finding is of very low safety significance due to the lack of large fire sources as well as the existence of sufficient cable separation in the affected fire zone. This finding is related to the problem identification and resolution cross-cutting area because FENOC did not implement effective corrective actions, resulting in three ERF EDG failures in 2004. (Section 1R12).

- Green. A self-revealing, non-cited violation of Technical Specification (TS) 6.8.1 was identified when the Unit 2 Turbine Driven Auxiliary Feedwater (TDAFW) pump failed a quarterly test due to improper seal packing adjustment. During the test, the operators secured the pump when the outboard gland temperature exhibited excessive temperatures due to lack of seal leak-off. The outboard packing was adjusted during the previous successful test of the TDAFW pump, however, the licensee did not use an adequate packing adjustment procedure.

  The finding is greater than minor because it adversely affected the reliability of a safety-related AFW pump as well as the mitigating systems cornerstone objective. The finding is of very low safety significance since an engineering analysis determined that the pump would have remained operable, and was therefore capable of performing its design basis function. (Section 1R15)

B. Licensee Identified Violations

None

REPORT DETAILS

Summary of Plant Status:

Unit 1 began the period operating at 100 percent power. On October 18, 2004, the unit was taken off-line for a refueling outage. The unit was returned to service on November 14 and reached 100 percent power on November 22 where it continued to operate for the remainder of the period. Unit 2 operated at essentially 100 percent power for the entire inspection period.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 sample)

a. Inspection Scope

The inspectors evaluated the licensee's preparation for the onset of very low temperatures. This evaluation included a review of the Updated Final Safety Analysis Report (UFSAR), TSs, and plant procedures including 2-OST-45.11, "Cold Weather Protection Verification." The inspectors also performed a detailed walkdown of the Unit 2 heat trace system utilizing procedure, 2OM-45D.3.C, "Power Supply and Control Switch List."

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04)

a. Inspection Scope

Partial 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 October 13 and October 14, 2004, the inspectors performed a walkdown of the the temporary fire pump and hoses set up at the Unit 2 cooling tower while the main electric and diesel driven fire pumps were out of service. The pumps were on a clearance in order to repair a leak in the fire header located in the intake structure. The fire header pressure was able to be maintained by the filtered water system during this maintenance activity.

- On December 1, 2004, the inspectors performed a walkdown of the Unit 1 'A' recirculation spray system while the 'B' train was out of service for planned maintenance associated with a motor-operated valve and various preventive maintenance tasks.

- On October 19, 2004, the inspectors walked down the Emergency diesel generator No. 2 during surveillance testing on Emergency diesel generator No. 1. The inspectors verified that the associated surveillance activities did not adversely affect redundant components.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05 - 10 samples)

a. Inspection Scope

Fire Area Walkdowns. The inspectors reviewed the Unit 1 Updated Fire Protection Appendix 'R' Review, Rev. 25, and the Unit 2 Fire Protection Safe Shutdown Report, Addendum 27, and identified the following risk significant areas for inspection:

- Unit 1 'A' Charging Pump Cubicle (Fire Area PA-1f)
- Unit 1 'B' Charging Pump Cubicle (Fire Area PA-1g)
- Unit 1 'C' Charging Pump Cubicle (Fire Area PA-1h)
- Unit 1 Steam Generator Blowdown Area (Fire Area SGPD-1)
- Unit 1 Control Room HVAC Equipment Room (Fire Area CR-2)
- Unit 2 Pipe Tunnel (Fire Area PT-1)
- Unit 2 Primary Auxiliary Building EL 755'-6" (Fire Area PA-4)
- Unit 2 Primary Auxiliary Building EL 773'-6" (Fire Area PA-5)
- Unit 2 Battery Room 2-4 (Fire Area SB-9)
- Unit 2 Non-Safety Battery Room (Fire Area SB-10)

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. 9. This review, for example, included First Energy Nuclear Operating Company's (FENOC) control of transient combustibles, material condition of fire protection equipment, and the adequacy of any fire protection impairments and compensatory measures.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07 - 1 sample)

a. Inspection Scope

The inspectors reviewed FENOC's tube plugging activities associated with the Unit 1 'C' recirculation spray heat exchanger as documented in Work Order (WO) 200066742. As part of this review, the inspectors performed a field walkdown of the maintenance

activities in the containment building and verified the limits established by calculation 8700-DMC-2353, " Evaluation of Tube Plugging Limits for the Recirculation Spray Heat Exchangers," Rev. 1, were not exceeded.

b. Findings

No findings of significance were identified

1R08 Inservice Inspection Activities (71111.08P - 1 Sample)

a. Inspection Scope

The inspector reviewed a number of Electric Power Research Institute (EPRI) Eddy Current examination technique specification sheets (ETTS) to determine whether eddy current probes and equipment were qualified for the expected degradation mechanisms. The inspector also verified that examination techniques, which were reviewed by utility-designated qualified data analyst, conformed with the qualification requirements specified by EPRI guidelines, "Pressurized Water Reactor Steam Generator Examination Guidelines, 100318, Revision 6, Appendix H." The inspector also reviewed the ETTS data to determine if the nondestructive evaluation uncertainty was included in the calculation methods used to support the in-situ leak-test screening criteria, however; no in-situ leak-testing was planned at the time of the inspection.

The inspector reviewed several documents, and compared the information contained in these documents to the current eddy current data and reported degradation to assess the licensee's degradation management program and predictive capability. For example, the inspector verified whether there was good correlation between the predicted degradation and that discovered during the current outage. Additionally, the inspector verified that the reports included appropriate consideration of potential degradation mechanisms based on site-specific and industry experience, and appropriately considered areas of the steam generators that presented potential challenges to the eddy current testing technology. The documents that were reviewed included:

- "Beaver Valley Unit 1 Cycle 16 Steam Generator Operational Assessment," SG-SGDA-03-0-31, dated July 2003

- "Beaver Valley Power Station Cycle 16 Steam Generator Tube Inspection 90 Day Report," dated July 24, 2003

- "Beaver Valley Power Station Unit 1 Steam Generator Degradation Assessment 1R16 Refueling Outage," SG-SGDA-04-43, dated October 2004

Because this was an "alternate repair criteria" steam generator program, the inspector verified that depth sizing criteria was adhered to, where applicable. The inspectors observed a steam generator outage meeting where potential tube plugging candidates

were discussed, as well as potential thermal-hydraulic imbalances that could be caused by disproportionate plugging of one generator.

The inspector verified that the Unit 1 steam generators had not experienced secondary side leakage during the prior power cycle. Additionally, the inspector could not assess loose parts inspections since the secondary side of the generators had not been drained at the time of this inspection, and therefore, had not been performed.

The inspector reviewed radiographs of feedwater valve WFPD-17-3B-F-4A, and verified that they conformed with the American Society of Mechanical Engineers (ASME) Code requirements for quality. While the radiographs revealed welding flaws determined by the licensee and required repair, there were no samples available for review during this inspection that involved indications left in-service.

The inspectors reviewed Beaver Valley's boric acid corrosion control program, which is performed in accordance with 1/2-ADM-2112, "Beaver Valley Power Station Units 1 and 2 Boric Acid Corrosion Control," Rev. 3. The inspectors accompanied site personnel on their initial refueling outage sixteen (1R16) containment walkdown and observed the identification of various boric acid leaks with emphasis on areas that could cause degradation of safety significant components. The inspector verified that potential problem areas identified during the walkdown were entered into the corrective action program, and reviewed several of these condition reports. The inspector reviewed engineering evaluations to verify that equipment or components that were wetted or impinged upon by boric acid solutions were properly analyzed for degradation that might impact their associated design basis functions.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

1. Resident Inspector Quarterly Review of Requalification Training (71111.11Q - 1 sample)

a. Inspection Scope

The inspectors observed the conduct of Unit 1 licensed operator requalification training evaluations conducted in the plant reference simulator on December 6, 2004. The inspectors observed licensed operator performance, with a particular focus on effective communications, implementation of abnormal and emergency operating procedures, command and control, technical specification compliance, and emergency plan implementation. The inspectors evaluated simulator fidelity to verify 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 ensure deficiencies in operator performance were properly identified, and that identified conditions adverse to quality were appropriately entered into the corrective action program for resolution. Deficiencies noted during this exam were documented in

Condition Report (CR) 04-09752 (See Section 4OA5). 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

2. Regional Inspector Biennial Review of Requalification Training (71111.11B - 1 sample)

a. Inspection Scope

On December 10, 2004, the inspector conducted an in-office review of licensee annual operating test results and, as applicable, comprehensive written exam results for 2004. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The inspector verified that:

- Crew failure rate was less than 20%. (Unit 1 and 2 crew failure rates were 0%.)

- Individual failure rate on the dynamic simulator test was less than or equal to 20%. (Unit 1 individual failure rate was 0%. Unit 2 individual failure rate was 2%.)

- Individual failure rate on the walk-through test was less than or equal to 20%. (Unit 1 and 2 individual failure rates were 0%.)

- Individual failure rate on the comprehensive written exam was less than or equal to 20%. (Unit 1 individual failure rate was 11%. Unit 2 did not administer the comprehensive written exam this year.)

- Overall pass rate among individuals for all portions of the exam was greater than or equal to 75%. (Unit 1 overall pass rate was 89%. Unit 2 overall pass rate was 98%.)

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

1. Resident Inspector Quarterly Evaluation (71111.12Q - 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 structures, system, and components (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 1. 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:

- Three separate failures/trips of the ERF EDG as documented in CR 04-00199, CR 04-07671, and CR 04-09690.

- CR 04-09079, " Unit 2 'A' Containment Air Recirculation Fan, 2HVR-ACU201A, Trip"

b. Findings

Inadequate Corrective Actions to Preclude Repetitive Emergency Response Facility Emergency Diesel Generator Failures

Introduction. A Green NCV was identified for not providing adequate corrective actions to address repetitive failures of the ERF EDG as required by the Beaver Valley Power Station (BVPS) Operating license.

Description. The inspectors evaluated three unexpected trips of the ERF EDG that occurred on January 8, October 14, and December 9, 2004, during surveillance runs. Each failure was addressed in CRs 04-00199, 04-07671, and 04-09690, respectively. All three trips were due to problems associated with the air flow switches of the ERF EDG radiator cooling fans. The ERF EDG has two air flow switches which sense air pressure from radiator fans that reject heat to the atmosphere from the engine cooling system. Lack of proper air flow to either of the two switches will cause the ERF EDG to trip, and backup protection to the high jacket water (engine cooling) temperature trip. The first trip on January 8 revealed that one of the switches had failed due to foreign material which had entered the switch internals and prevented proper switch operation. The October 14 trip was attributed to an improper set up of the switch by licensee personnel following replacement that occurred in July. The engine tripped again during its normal monthly surveillance on December 9, due to improper flow swith operation

caused by foreign material. The licensee's corrective action for the third trip included the installation of a filter screen at the inlet of the flow switches to prevent the intrusion of foreign material into the switch internals. Although the licensee promptly generated CRs for each ERF EDG failure, the corrective actions were ineffective in preventing repetitive failures of the machine.

Analysis. The finding is considered more than minor since it is associated with degraded conditions that affect the mitigating systems cornerstone objective of preventing core damage during a fire scenario. The finding adversely impacted an alternative safe shutdown component, namely, the dedicated AFW pump. This pump is considered a safe shutdown component for a fire in the auxiliary feedwater pump room. All three AFW pumps on Unit 1 are physically located in the same room and do not have adequate fire barrier separation. BVPS Unit 1 Updated Fire Protection Appendix 'R' Review, Rev. 16 has an approved deviation for this condition where a dedicated AFW pump with its own separate emergency power supply represents the alternative safe shutdown path.

This finding was evaluated in accordance with Appendix 'F' of Manual Chapter 0609, "Significance Determination Process." For this analysis, the inspectors assumed an unavailability factor of .011, vice .01 for the dedicated AFW pump. This accounted for the loss of the ERF EDG which is the emergency power source for the dedicated AFW pump. Thus, during a loss of offsite power event the pump would be unavailable. Utilizing a 'high' degradation rating and a 3-to-30 day duration factor, the initial quantitative Phase 1 screening required further analysis for a postulated fire in the auxiliary feedwater pump.

The 'Phase 2' analysis evaluated potential fire sources and distances between the sources and the safe shutdown components. The inspectors performed a walkdown of the affected fire area, PT-1, "Pipe Tunnel Area," focusing on the subarea, QP-1, which houses the AFW pumps. This walkdown identified potential fire sources and the geometrical relationships between these sources and the vulnerable safe shutdown components. Taking into account the typical fire zone of influence and the type of ignition source, only the 'A' AFW pump motor (650 kw) fire source was retained. Using this source, the delta core damage frequency was determined to be 5.5 E-9. This value resulted in the finding being characterized as Green, i.e. of very low safety significance. Based on the inadequate measures to prevent repetitive failures of a BVPS fire protection component, this finding contains cross cutting aspects in the area of problem identification and resolution.

Enforcement. Section 2.C.5 of the facility license associated with BVPS Unit 1 requires, in part, that the licensee shall implement and maintain in effect all provisions of the fire protection program as described in the UFSAR. The UFSAR delegates authority for the fire protection quality assurance program to Appendix 'C', "Fire Protection" of the Augmented Quality Assurance (QA) program manual. In turn, the BVPS Augmented QA Manual, Appendix 'C', requires measures to assure that the applicable corrective action guidelines of the QA program manual are included in activities affecting the Fire Protection System. Finally, the QA program manual, Section A.6, "Corrective Action",

requires that for significant conditions adverse to quality, the cause shall be determined and corrective actions to preclude repetition are identified and tracked until completed and verified. Contrary to the above, the licensee failed to take adequate corrective action to prevent repetitive failures of the ERF EDG in 2004. Because this deficiency was of very low safety significance and has been entered into the corrective action program as CR 04-09690, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000412/2004006-01, Inadequate Corrective Actions to Preclude Repetitive Emergency Response Facility Emergency Diesel Generator Failures.

2. Regional Inspector Biennial Periodic Evaluation (71111.12B)

a. Inspection Scope

The inspector reviewed the periodic evaluation required by 10 CFR 50.65 (a)(3) for the Beaver Valley Power Station, to verify that structures, systems and components (SSCs) within the scope of the maintenance rule were included in the evaluation, and that balancing of reliability and unavailability was given adequate consideration. The inspector reviewed the licensee's most recent periodic evaluation report which covered the interval November 1, 2001 through June 31, 2003. The inspector verified that the periodic evaluation was completed within the required two year time period.

The inspector selected the following systems in (a)(1) status for a detailed review:

- Service Water (System 30-Unit 2)
- 480 VAC Station Service (System 37-Unit 1)
- 480 VAC Station Service (System 37-Unit 2)
- Reactor Control and Protection (System 1-Unit 1)
- 4 KV Station Service (System 36B-Unit 2)

The inspector verified that: (1) goal setting and performance criteria were appropriate; (2) industry operating experience was considered; (3) problem identification and resolution of maintenance rule-related issues were addressed; (4) corrective action plans were effective; and (5) performance was being effectively monitored. The inspector verified that adjustments were made in action plans for SSCs in (a)(1) status as a result of the licensee's review of system performance. During the evaluation period, a total of fifteen (15) SSCs were being monitored in (a)(1) status with eleven (11) SSCs moved to (a)(2) status during the period. The inspector reviewed documentation and conducted interviews with the appropriate Beaver Valley risk analysts to verify that the licensee appropriately balanced reliability and availability/unavailability. The inspector verified that (a)(1) goals were adjusted as necessary if performance criteria were not being met. The inspector reviewed availability/unavailability tracking and trending data for the Service Water System (Unit 1), 480 VAC System (Unit 1 and 2) and the Reactor Protection System (Unit 1) and determined that the trends were in the acceptable range and performance criteria had not been exceeded.

The inspector selected a sample of risk significant SSCs (Quench Spray System-Unit 1, Reactor Protection System-Unit 1 and 4KVS Distribution-Unit 2) that were in a(2) status to verify that the licensee had established appropriate performance criteria (PC). Also, the inspector confirmed that the licensee examined any SSCs that failed to meet their PC and reviewed those SSCs that exhibited repeated maintenance preventable functional failures for consideration of movement to (a)(1) status.

The inspector reviewed documentation for a sample of systems that the licensee had changed from (a)(1) status to (a)(2) status during the periodic assessment period. The inspector selected the Main Feedwater (Unit 2) and the 4 KV Safety Related Breakers (Unit 2) to verify that (a)(1) goals had been met to return the systems to (a)(2) status.

In addition, the inspector verified that the licensee had established and implemented a preventive maintenance program to manage preventive maintenance activities for systems in both (a)(1) and (a)(2) status. A sample of risk significant systems in (a)(1) and (a)(2) status were reviewed to verify the performance of condition monitoring and scheduled maintenance.

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

- The inspectors reviewed the licensee’s risk assessment following a packing seal failure that led to an unplanned shutdown of the Unit 2 Turbine Driven Auxiliary Feedwater (TDAFW) pump during a surveillance test on November 2, 2004. This emergent risk assessment captured the increased risk associated with the seal failure including a period of unavailability for subsequent pump repair. See Section 1R15 for further details.

- The inspectors evaluated the licensee’s risk assessment associated with the planned actuator replacement on the Unit 2 residual heat release valve performed from November 29, 2004 to December 6, 2004.

- The inspectors reviewed the licensee's risk assessment associated with a 24-hour EDG run performed from December 1 to December 2, 2004, in accordance with 1OM-36.4AK, "No. 2 Diesel Generator 24 Hour Run," Rev. 0.

- On December 9, 2004, the ERF diesel generator tripped during the monthly surveillance run. The inspectors reviewed the licensee's updated risk assessment as a result of this emergent failure.

- The inspectors reviewed the licensee's risk assessment associated with an emergent failure of the Unit 2-2 battery charger which occurred on December 28, 2004.

- The inspectors reviewed the licensee's actions associated with the increased risk from an emergent activity that required the operation of the swing "C" charging pump on 11/24/04.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 5 samples)

a. Inspection Scope

The inspectors reviewed the following five conditions to determine whether proper operability determinations (OD), Basis For Continued Operations, or applicable assessments were performed. In addition, where applicable, the inspectors verified that TS limiting conditions for operation (LCO) requirements were properly addressed and that compensatory measures, if implemented, were appropriate for the condition.

- The inspectors reviewed the licensee's operability assessment of the Unit 2 TDAFW pump following a packing seal failure that led to an unexpected shutdown of the pump during a quarterly test on November 2, 2004. In addition, the inspectors observed the operability demonstration following seal re-packing.

- The inspectors reviewed an OD associated with a pinhole leak on the 'B' train of the Reactor Plant River Water (RPRW) system. The flaw was discovered on a weld in a section of 20" diameter pipe located in the supply header of the RPRW 'B' train. Structural integrity was verified in accordance with American National Standards Institute B31.1, 1967 edition through the summer of 1971, based on adequate wall thickness at a 1.5" periphery from the flaw.

- The inspectors reviewed the OD associated with the identification of holes on the Unit 1 containment sump cover during the refueling outage 16 (1R16) in November 2004. The review verified the adequacy of the basis for operability detailed in CR-04-07863,"Potential For Debris On BVPS-1 Containment Sump Screens," and CR-

04-08938, “Potential Entry Points For Debris To Enter The RC Sump Not Previously Identified.”

- The inspectors reviewed a revision to BCO 1-03-008, which addressed the continued operability of safety-related breakers containing RMS-9 trip units that are susceptible to spurious trips. The review focused on the acceptability of extensions to the scheduled replacement of 480-Volt breakers, relative to the timeliness standard of NRC Inspection Manual Part 9900, which requires the implementation of corrective actions “commensurate with the safety-significance of the issue.”

- The inspectors reviewed the basis for operability following the identification of repeatability problems during calibrations associated with the Unit 1 emergency bus degraded voltage relays conducted on November 4, 2004. The review included discussions with relay department supervision, and an assessment of the adequacy of response to the issues identified in CR 04-08805, “Engr 1DF 4kV Emerg Bus Degraded Volts Rel 27-VF2100AB Erratic Operations.”

b. Findings

Inadequate Implementation of a TDAFW Pump Seal Packing Procedure

Introduction. A Green NCV was identified for the licensee not implementing adequate procedures for pump seal packing adjustments on a safety-related pump in accordance with the requirements of TS 6.8.1.a.

Description. On November 2, 2004, during a quarterly surveillance test, the Unit 2 TDAFW pump was shutdown from the control room due to high packing gland temperature as directed by procedure. The operators measured the outboard gland temperature at 212 degrees F, and observed that no seal leak-off was flowing to cool the packing. Immediately following shutdown, gland temperature increased to 247 degrees F and operators observed the smell of burning packing. With the pump shut down, the seal leak-off returned and the gland temperature decreased. Subsequent to this failure, the licensee replaced the packing, performed a successful operability demonstration, and declared the pump operable on November 4, 2004.

Although the pump passed its operability demonstration in September, the incorrect packing adjustment that was performed based on “skill of the craft” manifested itself during surveillance testing in November. The licensee has an adequate pump packing program, but failed to reference appropriate procedures for packing adjustments in the pump operability procedure.

Analysis. The issue was more than minor because it involved the performance of a safety system in the mitigating systems cornerstone. The inspectors conducted a significance determination process (SDP) Phase 1 screening in accordance with IMC 0609, Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power Situations.” The finding was determined to be Green because the packing failure did not result in a loss of function per Generic Letter 91-18.

The licensee performed a packing failure evaluation with respect to TS operability and PRA availability. The licensee's assessment found that significant packing degradation would have occurred, but that the pump would have been capable of performing its design basis function during an accident. As a result, the pump was determined to be operable but degraded between the September and November tests.

Enforcement. Technical Specification 6.8.1 requires the licensee to establish, implement, and maintain procedures for the Auxiliary Feedwater System as referenced in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Contrary to these requirements, the licensee did not implement adequate procedures for TDAFW pump seal packing adjustments. Because this deficiency was of very low safety significance and has been entered into the corrective action program as CR 04-08631, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000412/2004006-02, Inadequate Implementation of a TDAFW Pump Seal Packing Procedure.

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

a. Inspection Scope

The inspectors reviewed and/or observed the following 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:

- 1T-24-20183-1, "Feedwater Containment Isolation Valve [HYV-1FW-100A] Modification Test," Rev. 3, Unit 1 Refueling Outage-16, following installation of three new Unit 1 fast acting feedwater and containment isolation valves.

- 2OST-7.6, "Centrifugal Charging Pump [2CHS*P21C]," Rev. 25, performed on November 19, 2004, following preventative maintenance on the Unit 2 'C' charging pump, including a discharge check valve inspection.

- 1OST-47.3M, "Containment Isolation and ASME Section XI Test - Work Week 9," Rev. 6, performed on November 30, 2004, following a molded case circuit breaker replacement associated with the motor operated valve, MOV-1RS-156B, "2B Outside Recirc Spray Pump Discharge Valve."

- 2OST-47.3G, "Containment Penetration and ASME Section XI Test - Work Week 2," Rev. 2, performed on December 6, 2004, following installation of a new Kerry actuator on 2SVS*HCV104, "Residual Heat Release Valve."

- 2OST-30.3, "Service Water Pump [2SWS*P21B] Test," Rev. 28 and 2OST-30.6B, "Service Water Pump [2SWS*P21C] Test on Train 'B' Header," Rev. 11, performed on December 13 and December 30, 2004, respectively, following installation of a new discharge check valve for the Unit 2 'B' Service water pump, 2SWS-58.

- 1OST-15.1, "[1CC-P-1A] Quarterly Test," Rev. 15, performed on August 19, 2004, following motor re-installation after completion of overhaul including bearing replacement.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors observed selected outage activities to determine whether shutdown safety functions (e.g., reactor decay heat removal, reactivity control, electrical power availability, reactor coolant inventory, spent fuel cooling, and containment integrity) were properly maintained as required by technical specifications (TS), and NOP-OP-1005, "Shutdown Safety," Rev.0. The inspectors evaluated specific performance attributes, including configuration management, communications, instrumentation accuracy, and identification and resolution of problems. The inspectors also evaluated the following activities:

- Pre-Outage Shutdown Safety Review
- Plant shutdown and cooldown, including compliance with TS acceptance criteria
- Refueling Operations
- Spent fuel pool cooling system operation
- Clearance execution
- Configuration and inventory control during periods of reduced reactor coolant system (RCS) inventory due to the associated increase in shutdown risk.
- Performed a walkdown of the residual heat removal system
- Coordination of electrical bus work and minimization of shutdown risk
- Performed a walkdown of the reactor coolant system level instrumentation during periods of reduced inventory to verify appropriate configuration.
- Verified maintenance of boration flowpaths
- Performed a detailed walkdown of containment prior to closeout and the establishment of a vacuum

- Reviewed the containment sump inspection surveillance
- Attended restart readiness meetings and verified compliance with the associated procedure
- Observed a containment equipment hatch emergency closure drill

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 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-13.7F, "2B Recirculation Spray Pump Auto Start Test," Rev. 1
- 1OST-11.4A, "LHSI Full Flow Test," Rev. 16
- 1OST-36.7, "Offsite to Onsite Power Distribution System Breaker Alignment Verification," Rev. 8
- 1OST-36.3, "Diesel Generator No. 1 Automatic Test", Rev. 19
- 2OST-30.6B, "Service Water Pump [2SWS*P21C] Test on Train B Header," Rev. 11

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 was reviewed against the system design 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.

- Unit 1 TM 1-04-015, Rev. 0, "Isolation of Primary Coolant Cold Leg Sample Lines."

- Unit 1 TM 1-04-019, Rev. 0, “Block Open BVPS-1 Blowdown Isolation Valve, TV-1BD-101A1 (HELB Isolation).”

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

An in-office inspection that reviewed recent changes to emergency plan implementing procedures was conducted on December 16, 2004. A thorough review was conducted for documents related to the risk significant planning standards (RSPS) and a general review was completed for non-RSPS documents. The review verified the changes satisfied the standards of 10 CFR 50.54(q), 10 CFR 50.47(b), the requirements of 10 CFR 50 Appendix E, the intent of NUREG-0654, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” and that the changes did not decrease the effectiveness of the plan. These changes are subject to future NRC inspections to ensure that as a result of these changes, the emergency plan continues to meet NRC regulations.

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 (10 samples)

During the period November 1 - 5, 2004, 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, and that workers were adhering to these controls when working in these areas during the Unit 1 refueling outage. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee’s procedures. This inspection activity represents completion of ten (10) samples relative to this inspection area.

Completion of the 10 (outage related) access control samples, in conjunction with the 11 samples (power operations related) completed during the period February 23 - 27, 2004, completes the 71121.01 annual inspection requirement of 21 samples.

Plant Walkdown and RWP Reviews

- During the Unit 1 refueling outage, the inspector identified exposure-significant work areas in the Unit 1 reactor containment building. The inspector reviewed radiation survey maps and radiation work permits (RWP) associated with these areas to determine if the associated controls were appropriate.

- The inspector toured the accessible radiological control areas in Unit 1, including portions of the Unit 1 containment building and the Unit 1 auxiliary building. With the assistance of radiation protection technicians, the inspector performed independent surveys of selected areas during the tours to confirm the accuracy of survey maps and the adequacy of postings.

- In evaluating the RWPs, the inspector reviewed electronic dosimeter dose/dose rate set points to determine if the set points were consistent with the survey locations 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 activities reviewed included reactor under-head weld preparation/inspection (RWP 104-4052), reactor cavity drain-down/decontamination (RWP 104-4034), steam generator platform work (RWP 104-4040), instrumentation & control department tasks (RWP 104-4014), valve repairs on the residual heat removal system/excess letdown system (RWP 104-4046), erect/remove scaffolding (RWP 104-4010) and miscellaneous valve repairs (104-4045).

- The inspector reviewed the RWPs and associated instrumentation and engineering controls (e.g. portable ventilation systems) for potential airborne radioactivity areas located in the Unit 1 containment building. The inspector confirmed that no worker received an internal dose in excess of 50 mrem due to airborne radioactivity when performing outage related activities.

High Risk Significant, High Dose Rate HRA and VHRA Controls

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

- The inspector discussed with the Supervisor, Radiation Protection Services, the preparations that were made for retracting the Unit 1 incore detectors, including the securing and posting the affected areas as Very High Radiation Areas (VHRA).

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope (7 samples)

During the period November 1 - 5, 2004, 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 1 refueling outage and an entry into the Unit 2 reactor containment during power operations. Implementation of these controls were reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures. This inspection activity represents completion of 7 samples relative to this inspection area.

Radiological Work Planning

- The inspector reviewed pertinent information regarding cumulative exposure history, current exposure trends, and ongoing activities to assess current performance and outage exposure challenges. The inspector determined the site's 3-year rolling collective average exposure.

- The inspector reviewed refueling outage work activities scheduled during the inspection period and the associated work activity exposure estimates. Scheduled work reviewed included reactor head weld preparation/inspection, reactor cavity drain-down/decontamination, and disassembly/removal of in-containment scaffolding. The inspector interviewed the Construction Services Supervisor regarding the work planning/scheduling process to evaluate the method for forecasting dose for outage support activities.

- The inspector reviewed procedures associated with maintaining worker dose ALARA and estimating and tracking work activity specific exposures.

- The inspector reviewed 1R16 dose summary reports, detailing worker estimated and actual exposures, through November 4, 2004, for jobs performed during the refueling outage to compare actual exposures with forecasted data. Additionally, the inspector reviewed doses for the highest exposed individuals, and dose extension reports, to assess the effectiveness of the licensee's controls to limit occupational dose below the regulatory criteria.

- The inspector evaluated the exposure mitigation requirements specified in RWPs and the associated ALARA Reviews (AR). Jobs reviewed included reactor head inspections (RWP 104-4052/AR 04-1-47), erecting/removing scaffolding (RWP 104-4010/AR 04-1-05), steam generator platform work (RWP 104-4040/AR 04-1-24),

outage instrumentation & control maintenance (RWP 104-4014/AR 04-1-06), RHR/excess letdown system valve repairs (RWP 104-4046/AR 04-1-29), miscellaneous valve repairs (RWP 104-4045/AR 04-1-28) and reactor cavity drain-down/decontamination (RWP 104-4034/AR 04-1-18).

- The inspector evaluated the departmental interfaces between radiation protection, operations, maintenance crafts, and engineering, to identify missing ALARA program elements and interface problems. The evaluation was accomplished by interviewing the ALARA Supervisor and Radiation Protection Manager, attending ALARA Committee daily meetings (on November 2, 3, & 4, 2004), attending various pre-job planning/RWP briefings, attending a post-job debriefing for a Unit 2 entry (for oil addition to a reactor coolant pump), and interviewing workers performing tasks in the Unit 1 containment building.

- The inspector determined if work activity planning included the use of temporary shielding, system flushes, and operational considerations (e.g., adjusting steam generator water levels) to further minimize worker exposure. The inspector performed independent survey measurements on areas where temporary shielding was installed in the Unit 1 containment, including the reactor head, miscellaneous waste storage, and steam generator work areas. The inspector reviewed pre-and post-shielding dose rate survey data for selected areas/systems to evaluate the effectiveness of source term reduction efforts.

Verification of Dose Estimates and Exposure Tracking Systems

- The inspector reviewed the assumptions and basis for the annual site collective exposure estimate and the Unit 1 refueling outage dose projection. The inspector reviewed personnel contamination event reports, whole body counting data, and related calculations for potential internal dose estimates for selected personnel.

- The inspector reviewed the licensee's method for adjusting exposure estimates, and replanning work, when actual dose approached estimated dose. The inspector attended daily ALARA Committee meetings to assess how dose for various outage-related tasks was controlled and managed.

- The inspector reviewed the licensee's exposure tracking system to determine whether the level of dose tracking detail, exposure report timeliness, and exposure report distribution was sufficient to support the control of collective exposures. Included in this review were departmental dose reports, individual exposure records, and dose tracking information for declared pregnant workers (DPW).

Job Site Inspection and ALARA Control

- The inspector observed maintenance and operational activities being performed for reactor cavity drain-down/decontamination, demobilization of outage equipment, scaffolding removal, and reactor head weld preparation/inspections in the Unit 1 containment building. The inspector verified that the appropriate radiological

controls were implemented, including radiation protection coverage, contamination mitigation, properly located dosimetry, and that workers were briefed on job site radiological conditions.

- The inspector reviewed the exposure of individuals in selected work groups, including mechanical maintenance, radiation protection, and outage support services to determine if supervisory efforts were being made to equalize doses among workers. The inspector also interviewed the ALARA Supervisor regarding the monitoring and the dose distribution to site personnel.

Source Term Reduction and Control

The inspector reviewed the current status and historical trends of the Unit 1 source terms. Through interviews with the Radiation Protection Manager and the ALARA Supervisor, the inspector evaluated the licensee's source term measurements and control strategies. Specific strategies currently employed by the licensee include system flushes, installation of temporary shielding, and chemistry controls. The inspector also reviewed preparations for installation of new steam generators during the Unit 1 refueling outage 1R17.

Radiation Worker Performance

- The inspector observed radiation worker and radiation protection technician perform various tasks including reactor head weld preparations/inspections and reactor cavity drain-down/decontamination. Through interviews with selected individuals, the inspector determined whether individuals were aware of job site radiological conditions and access controls, and that the worker skill level was sufficient with respect to the radiological hazards and the work involved.

- The inspector attended pre-job briefings for exposure-significant tasks to evaluate the adequacy and accuracy of information provided to workers. Pre-job briefings attended included reactor cavity drain-down/decontamination and reactor head weld preparation/inspections in the Unit 1 containment building.

- The inspector reviewed condition reports related to radiation worker and radiation protection technician errors, and personnel contamination reports (PCR) to determine if an observable pattern traceable to a common cause was evident.

Declared Pregnant Workers

The inspector reviewed the radiological control records for a declared pregnant worker (DPW) and the associated procedure for managing DPWs exposures to evaluate the effectiveness in tracking and controlling the individual's exposure.

Problem Identification and Resolution

The inspector reviewed elements of the licensee's corrective action program related to implementing the radiological controls program to determine if problems were being entered into the program for resolution. Details of this review are contained in Section 4OA2 of this report.

b. Findings

No findings of significance were identified.

Cornerstone: Occupational Radiation Safety

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

a. Inspection Scope (9 samples)

During the period October 4 - 8, 2004, 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 procedure and current source activities/dose rate characterizations for the two (2) Sheperd Model 89 beam calibrators and the Shepard Model 81 panoramic calibrator. The inspector reviewed the calibration records for the Victoreen Model 500 Electrometer and associated ion chambers used in calibrating the Sheperd calibrators.

- The inspector reviewed the calibration records for selected survey instruments and contamination monitors including portable neutron survey instruments (PNR-4), small article contamination monitors (SAM-11), personnel contamination monitors (PCM-2), portal monitors (SPM-906), whole body counting systems (FastScan and AccuScan II), and contamination friskers (RM-14).

- The inspector observed a technician performing daily functional checks on a variety of contamination monitors located in Unit 1 and 2, including personnel contamination monitors (PCM-2), portal monitors (SPM-906) and small article monitors (SAM-11). The inspector observed the technician perform the weekly operability checks on two (2) PCM-2 monitors located near the Unit 1 hot side tool room.

- The inspector reviewed the calibration procedure and current calibration data for selected area monitors, including the Unit 2 Incore Instrument Room Area (2RMR-RQ204) and the Unit 2 Waste Handling Area (2RMJ-RQ201).

- The inspector reviewed recent contamination sampling results for the Unit 1 and 2 to determine if the calibration sources were representative of the radioisotopes found in the plant source term.

- The calibration records and quality control verification records were reviewed for selected electronic dosimeters.

- 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 at least three licensed 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, physically inspected three SCBAs, staged for use in the Fire Brigade Room, in the Unit 1 turbine building, and in the Unit 1 auxiliary building. 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 cylinders, were reviewed to confirm that the air quality met CGA-G-7.1-1997 Grade D standards.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

1. Reactor Coolant System Identified Leak Rate (2 samples)

a. Inspection Scope

The inspectors reviewed the Unit 1 and Unit 2 PI for unidentified Reactor Coolant System (RCS) leak rate for the period December 2003 through November 2004. The accuracy of reported data was verified by reviewing selected monthly operating reports, shift operating logs, LERs, and surveillance tests. The inspectors verified the RCS leak rate data reported was consistent with NRC approved guidance, provided in Nuclear Energy Institute (NEI) 99-02.

b. Findings

No findings of significance were identified.

2. Reactor Coolant System Specific Activity (2 samples)

a. Inspection Scope

The inspectors reviewed the Unit 1 and Unit 2 PI for RCS specific activity for the period December 2003 through November 2004. The accuracy of reported data was verified by reviewing the results from TS sampling, other chemistry samples of the RCS, and supporting calculations and calculation methodology. The inspectors verified the RCS specific activity data reported was consistent with NRC approved guidance, provided in NEI 99-02, Rev. 2.

b. Findings

No findings of significance were identified.

3. Residual Heat Removal System Unavailability (2 samples)

a. Inspection Scope

The inspectors reviewed the Unit 1 and Unit 2 performance indicators for the systems that provide post-accident recirculation and shutdown cooling. The specific systems reviewed included the Unit 1 low head safety injection, recirculation spray, residual heat removal systems and the Unit 2 recirculation spray and residual heat removal systems. Due to the plant specific design, NEI 99-02, Appendix D, "Plant Specific Design Issues," Rev. 2, was used to determine the scope of the data collected. The inspectors verified accuracy of the reported data through reviews of shift technical advisors' logs and shift operator logs for the period December 2003 to November 2004.

b. Findings

No findings of significance were identified.

4. Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspector reviewed implementation of the licensee's Occupational Exposure Control Effectiveness Performance Indicator (PI) Program. Specifically, the inspector reviewed recent 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 2, to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators. This inspection activity represents the completion of one (1) sample relative to this inspection area, completing the annual inspection requirement.

b. Findings

No findings of significance were identified.

5. RETS/ODCM Radiological Effluent Occurrences (1 Sample)

a. Inspection Scope

The inspector reviewed relevant effluent release reports for the period January 1, 2004 through October 1, 2004, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences that exceed 1.5 mrem/qtr whole body or 5.0 mrem/qtr organ dose for liquid effluents; 5 mrads/qtr gamma air dose, 10 mrad/qtr beta air dose, and 7.5 mrads/qtr for organ dose for gaseous effluents. This inspection activity represents the completion of one (1) sample relative to this inspection area, completing the annual inspection requirement.

The inspector reviewed the following documents to ensure the licensee met all requirements of the performance indicator from the fourth quarter 2003 to the third quarter 2004 (4 quarters):

- monthly and 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

1. Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

a. Inspection Scope

The inspector reviewed selected Condition Reports (CR), Management Job Observations, and Nuclear Quality Assessment Field Observations to evaluate the licensee's threshold for identifying, evaluating, and resolving problems in implementing the radiation monitoring and respiratory protection programs. Included in this review were twenty-three (23) CRs, six (6) management observation reports, and five (5) quality oversight field observations. 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.

2. ALARA Planning and Controls

a. Inspection Scope

The inspector reviewed Condition Reports and recent Nuclear Quality Field Observation reports, relating to maintaining personnel exposure ALARA, to evaluate the threshold for identifying, evaluating, and resolving problems in implementing the radiological controls program. 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.

3. Condition Report Review under IP71111.12B

a. Inspection Scope

The inspector reviewed a sample of corrective action reports shown in Attachment 1 which identified problems related to maintenance rule issues. The corrective action sample identified one maintenance preventable functional failure in both system 34 (Compressed Air) and system 44E (Switchgear Area Ventilation). The inspector verified that problems with SSCs in the maintenance rule scope were being identified, evaluated, appropriately dispositioned and entered into the corrective action program.

b. Findings

No findings of significance were identified.

4. Annual Sample Review (1 sample)

Root Cause Analysis for Unit 1 River Water Pump High Vibration and Excessive Wear

a. Inspection Scope and Observations

The inspectors reviewed the root cause report performed under CR-03-08894, in which high vibrations and excessive wear exhibited by the "A" and "B" River Water (RW) Pumps were evaluated. The inspectors reviewed the root cause report, had discussions with appropriate personnel, and reviewed all pertinent information to assess the adequacy of FENOC's identified root cause and associated corrective actions. In particular, FENOC replaced the multiple line shaft bearings and couplings, as well as the motor bearings, in the Spring of 2004, and monitored thrust and vibration readings for several months to validate the effectiveness of the newly implemented designs. As a result of this significant overhaul and monitoring assessment of the "A" RW pump, the inspector evaluated the resulting performance of the "A" RW pump to determine if corrective actions have been effective. This effectiveness review also considered the

appropriateness of FENOC's planned implementation of the equivalent design changes on the "B" and "C" RW pumps, which are scheduled to be performed in 2005.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

6. 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.

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

Section 1R12 describes a finding for not implementing adequate corrective actions to preclude repetitive ERF EDG failures. Consequently, ineffective maintenance of the air flow switches impacted the engine's reliability and availability. This finding exhibited problem identification and resolution cross cutting aspects because the ERF EDG trips were not effectively resolved.

8. Semi-Annual Review of PI&R Trends

a. Inspection Scope

The inspectors reviewed site trending results to determine if trending was appropriately evaluated by FENOC. This review covered FENOC's 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 40A2.6), and (3) not indicative of a more significant safety concern.

b. Observations and Findings

The inspectors reviewed the most recent departmental trend results performed under FENOC's Collective Condition Report Review Process, which was conducted for the time period of May 1 - September 30, 2004. The inspectors reviewed the characterization of identified trends, and verified appropriate corrective actions were initiated. Additionally, while the inspectors determined that, in general, appropriate trends were identified by applicable departments, the following deficiencies were identified:

- The "trending program" remains relatively informal. Specifically, while the corrective action program, as defined in NOP-LP-2001, "Condition Report Process," Rev. 7, requires trending to be performed, the process for performance and frequency of these trend reviews are not captured formally in procedures. However, the inspector identified that formal procedures have been under development and scheduled for completion in the near future.

- A trend was identified regarding quality control hold point violations and upon review, was consistent with QC organization assessments; however, a condition report was never generated regarding this trend. CR-04-09787, "Trend on QC Holdpoint Violations," was subsequently generated.

4OA3 Event Follow-up

(Closed) Licensee Event Report (LER) 05000334/04-001: Control Rod Shutdown Bank Anomaly Causes Entry into Technical Specification

On August 14, 2004, during the performance of the monthly control rod movement testing, the operators noted an unexpected response of the rod control system while exercising the 'A' shutdown bank. Specifically, the operators noted that Group II of shutdown bank was two steps higher than expected at 223 steps withdrawn. Rod movement was secured and the surveillance testing suspended. Technical Specification (TS) 3.1.3.5 requires all shutdown rods to be fully withdrawn except during surveillance testing. There are no applicable action requirements for an entire bank not being withdrawn. Since the surveillance test was suspended to perform troubleshooting while the shutdown bank was not fully withdrawn due to a concern regarding the status of rod control, LCO 3.0.3 was entered at 0810. Following troubleshooting, shutdown bank 'A' was restored to the fully withdrawn position and LCO 3.0.3 was exited at 1107 since no

initial anomalies in the circuitry were detected. The event was reported as a condition prohibited by technical specifications. The cause of the event was a degrading slave cycler logic card inside the rod control logic cabinet. The inspectors determined that the probability and subsequent safety significance of this event was minimal, as documented in the LER. The inspectors performed an onsite review of the LER, verified corrective actions were appropriately implemented or scheduled, and determined there were no findings of significance. The event was documented in CR 04-06368. This event did not constitute a violation of NRC requirements. This LER is closed.

4OA5 Other Activities

1. Review of Generic Letter 89-13: Service Water System Problems Affecting Safety-Related Equipment (TI 2515/159)

a. Inspection Scope

The inspectors reviewed Beaver Valley Unit 1 river water (RW) system and Unit 2 service water (SW) system performance, which included a review of system design requirements, and operating, maintenance, and testing procedures. FENOC's inspection, cleaning, chemical control, and performance monitoring methods, frequencies, and test results of the RW and SW systems and their related components were compared to the commitments made in the response to the five recommended actions of Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety- Related Equipment." The inspectors reviewed design basis summary information, including flow calculations and RW and SW-related modifications, to ensure that FENOC was maintaining the design bases of these systems.

The inspectors also reviewed system operating, abnormal and emergency procedures, and operator training material associated with the Unit 1 river water and Unit 2 service water systems to determine whether the procedures were adequate to ensure that safety-related equipment cooled by these systems would function as intended, and that operators will perform effectively. In addition, operator logs were reviewed to determine the adequacy of temperature and flow monitoring, and to evaluate operator effectiveness in varying RW and SW system heat exchanger flow rates due to changing climate (temperature) conditions. During interviews of operations staff, RW and SW system walkdowns, and procedure and licensed operator training lesson plan reviews, the inspectors verified the ability of operators to locally operate RW and SW components. The inspectors reviewed selected RW and SW systems maintenance procedures and/or work orders to verify technical adequacy and proper implementation. The maintenance history and preventive maintenance requirements for selected RW and SW system components were reviewed to determine the effectiveness of corrective and preventive maintenance.

FENOC's program for operating experience and its implementation with respect to the Unit 1 river water and Unit 2 service water systems was reviewed in order to assess the effectiveness of operating experience in maintaining the functionality of these systems. The inspectors reviewed the operating experience administrative procedures, selected

several operating experience items for detailed review, and interviewed responsible station personnel.

Applicable condition reports (CRs), Licensee Event Reports (LERs), system health reports, self-assessments, and related, past, self-revealing and NRC-identified inspection findings were sampled to understand the RW and SW system maintenance and operational history, and FENOC's response to those identified adverse conditions.

b. Observations and Findings

No findings of significance were identified.

Overall, the inspectors concluded that Beaver Valley Power Station's response to GL 89-13 was appropriate and the recommended actions from GL 89-13, in general, have been effectively implemented and maintained. In addition, FENOC's operating experience program and implementing procedure have appropriately addressed and incorporated service water items, when applicable.

The specific responses to the questions directed by TI 2515/159 are contained in Attachment 2 of this report.

2. (Closed) URI 05000334&412/2004005-02: Acceptability of licensee's LOR written exam development methodology.

a. Introduction. During the July 2004 inspection of the Unit 1's licensed operator requalification (LOR) training program, inspectors identified an issue related to how the facility developed the Unit 1 LOR comprehensive written exam (NRC Inspection Report 05000334 and 05000412/2004005, Section 1R11). When choosing what subjects were to be tested, the training staff sampled subjects taught during the latter part of the previous LOR period and most of the current LOR period; they did not sample subjects taught during the latter part of the current LOR period.

b. Description. Inspectors noted that this method of sampling and testing followed BV site-specific instruction, 1/2-ADM-1351, "Licensed Operator Retraining Program," which uses a systems approach to training (SAT) methodology and is being used by the facility in lieu of paragraphs (c)(2), (3), and (4) of section 10 CFR 55.59. However, the Operator Licensing Program Office concluded that the comprehensive written exam administered for BV1's most recent 24-month LOR program (January 2003 through December 2004) did not comply with 10 CFR 55.59 because it was not comprehensive for that 24-month program. Regulatory Issue Summary 2003-10 states, in part, that "the comprehensive requalification written examination must occur during (and, consistent with the definition of comprehensive, preferably at or near the end of) each 24-month requalification training program." However, the comprehensive written exam may be administered before completion of the 24-month LOR program, as BV1 has done. But, in this instance, for the exam to be comprehensive with respect to the current 24-month LOR program, its test item sampling and selection process needed to include topics that were scheduled to be taught after completion of the exam and during the remainder of the 24-month program.

The regulation (10 CFR 55.59(c)(1)) indicates that each two year cycle (program) is considered a separate program. If the exam sampled these untaught topics, including any system and/or procedural changes scheduled for the remainder of the 24-month program, then, taken together with 10 CFR 55.59(a)(2)(i), (c)(1), and (c)(4)(ii), the licensee's methodology would have been in compliance.

c. Analysis. The inspectors determined the performance deficiency (i.e., not including topics taught within the 24-month LOR period on the comprehensive written exam) was applicable to both Units, and was not subject to traditional enforcement because the issue had no actual safety consequences; it did not affect the NRC's ability to perform its regulatory function; and there were no willful aspects to the issue.

The issue was minor because it was not a precursor to a significant event; if left uncorrected it would not become a more significant safety concern; it did not cause performance indicators to exceed a threshold; and, although it was associated with the Reactor Safety Cornerstone (i.e., Mitigating Systems), it did not affect that cornerstone's objective. More specifically, while there were no quality problems with the exams, the written exams did not completely include topics - selected by a sampling process - from the 24-month LOR period as defined per 55.59(c)(1), which is an administrative issue not affecting exam quality.

d. Enforcement. The issue constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the Enforcement Policy. It is being documented due to the potential generic application to facility licensees and their interpretation of 10 CFR 55.59. The licensee entered this issue into its corrective action process as Condition Report 04-09913. They also modified their test methodology to ensure topics taught during the current LOR period will be at risk of being sampled for inclusion on the comprehensive written exam. The URI is closed.

3. Inadvertent Potential Annual Requalification License Exam Security Compromise

On the evening of December 6, 2004, during the administration of an NRC annual requalification operating exam (see section 1R11), BVPS personnel inadvertently injected malfunctions into the practice simulator scenario administered prior to the start of the test. These malfunctions were intended for the first, graded simulator scenario of the test. At the time of the disclosure, BVPS management decided to continue to utilize the affected exam scenario; however, this scenario was then rearranged as the third scenario. BVPS personnel concluded that since the disclosure was deemed transparent to the operators and that the scenarios were reordered to ensure the operators were in different positions, the affected scenario could be used as part of the operating test. Subsequent discussions on December 13 and 14 between the NRC and the licensee resulted in the generation of CR 04-09752. This CR resulted in the reexamination of the crew for only the affected scenario to ensure that the exam compromise had no effect on the crew performance.

The inadvertent disclosure of a portion of an operating test is a violation of 10 CFR 55.49 because, but for detection, it would have affected the equitable and consistent

administration of the examination. This finding was considered minor in that it did not have any actual safety consequences, the issue was not a precursor to a significant event, if left uncorrected it was not likely to become a more significant event, the issue did not relate to a performance indicator, and the issue was not directly associated with one of the cornerstones objectives. Although this issue constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the Enforcement Policy, it is being documented because it is associated with an issue of agency wide concern (i.e., NRC exam security, NUREG-1021, Draft Revision 9, ES-501, E.3).

4. Temporary Instruction (TI) 2515/150, Revision 2, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles (NRC Order EA-03-009)

a. Inspection Scope

The inspector reviewed, verified, and/or observed the various inspections conducted on the reactor vessel head and associated penetration nozzles during the Unit 1 sixteenth refueling outage (1R16), which included ultrasonic, eddy current, and visual examinations. The results of this inspection are documented based on the answers to a minimum set of questions detailed in TI 2515/150, and are listed below:

a. The inspector verified that for the various inspections conducted on the vessel head and penetrations, the inspections were:

(1) performed by qualified and knowledgeable personnel. In addition to classroom training specifically related to the time-of-flight ultrasonic testing and surface cross-coil eddy current testing, the individuals had several years of job-related experience. In the case of the ultrasonic testing, the individuals had specific classroom training on the IntraSpec system as well. The individuals performing the eddy current testing were qualified data analysts;

(2) performed in conformance with demonstrated procedures;

(3) capable of identifying, dispositioning and resolving deficiencies; and

(4) capable of identifying the PWSCC and/or RPV head corrosion phenomena described in Order EA-03-009.

b. Evaluated the condition of the reactor head, and verified it was free of debris, insulation, dirt, or boron deposits. Except for the normal interference caused by the density of the control drive tubes, the inspector verified there were no interferences to visually examining the head penetrations. The technicians used remote camera equipment, which was illuminated for the purpose of viewing the entire penetration periphery of each control drive tube.

c. The inspector verified that small boron deposits, as described in NRC Bulletin 2001-01, could be identified and characterized.

d. The inspector verified there were no material deficiencies identified that required repair.

e. The inspector verified there were no unknown or unplanned impediments to the examinations.

f. The inspector evaluated the basis for the temperatures used in the susceptibility ranking calculation, and determined they were based on plant-specific measurements.

g. The inspector verified that the disposition of indications revealed during non-visual examinations was consistent with Appendix D of TI 2515/150.

h. The inspector verified that procedures existed to identify boric acid indications for pressure retaining components above the RPV head.

i. Because potential boric acid leaks from pressure-retaining components above the RPV head were not identified during this inspection, follow-on examinations did not need to be performed.

b. Findings

No findings of significance were identified.

5. Temporary Instruction 2515/152 Revision 1 - Reactor Pressure Vessel (RPV) Lower Head Penetration (LHP) Nozzles (NRC Bulletin 2003-02)

a. Inspection Scope

The inspector reviewed, verified, and/or observed the visual inspections conducted on the reactor vessel lower head and associated penetration nozzles during the Unit 1 sixteenth refueling outage (1R16). The results of this inspection are documented based on the answers to a minimum set of questions detailed in TI 2515/152, and are listed below:

a. The inspector verified that the visual inspections conducted on the vessel lower head and penetrations were:

(1) performed by qualified and knowledgeable personnel with certification to the American Society of Mechanical Engineers (ASME), Section XI, Level II and Level III for visual examiners;

(2) performed using procedures that were adequate for the purpose;

(3) capable of identifying, dispositioning and resolving deficiencies; and

(4) capable of identifying pressure boundary leakage and/or lower head corrosion as described in the bulletin.

b. The inspector verified that small boric acid deposits representing RCS leakage, as described in NRC Bulletin 2003-02, could be identified and characterized by the visual examination method used.

c. The inspector verified that the inspection was conducted by direct visual inspection, and observed a portion of the inspection activities.

d. The inspector verified that the inspection achieved examination for 360 degrees around the circumference of all nozzles and the vessel bottom head in its entirety.

e. The inspector observed that the lower head was rusted and stained by previous leakage from the refueling canal, which had been subsequently sealed, and did not obstruct the view of the penetrations.

f. The inspector verified that there were no material deficiencies identified.

g. The inspector determined that there were no impediments to the effective inspection of the penetrations.

h. The inspector verified that the condition of the reactor bottom head did not compel the licensee to perform follow-on examinations that would have been conducted to identify the source of dried boric acid deposits that could have emanated from locations above the reactor pressure vessel lower head.

i. The inspector verified that chemical samples were not taken from the bottom reactor head.

j. The inspector verified that the licensee was planning to clean the bottom head with liquified carbon dioxide to establish a baseline for the next inspection.

k. Not applicable. Since deposits were not identified during the inspection, conclusions and associated bases were not required.

b. Findings

No findings of significance were identified.

6. Temporary Instruction 2515/160, Pressurizer Penetration Nozzles and Steam Space Piping Connections In U.S. Pressurized Water Reactors (NRC Bulletin 2004-01)

a. Inspection Scope

The inspector reviewed, verified, and/or observed the visual inspections conducted on the pressurizer penetration nozzles and steam space piping connections during the Unit 1 sixteenth refueling outage (1R16). The results of this inspection are documented based on the answers to a minimum set of questions detailed in TI 2515/160, and are listed below:

a. The inspector verified that the visual testing (VT) examinations conducted on the Alloy 82/182/600 pressurizor penetrations were:

(1) performed by two, qualified and knowledgeable First Energy NDE inspection personnel with certification to the American Society of Mechanical Engineers (ASME), Section XI, Level II and Level III for visual examiners;

(2) implemented in conformance with First Energy inspection procedures and ASME requirements;

(3) capable of identifying, dispositioning and resolving deficiencies; and

(4) capable of identifying and characterizing leakage in the pressurizer penetration nozzle or steam space piping components, as discussed in NRC Bulletin 2004-01.

b. The inspector verified that the physical condition of the five Alloy 82/182/600 penetration nozzles and steam space piping components were observed to be free of debris, dirt, and boron deposits. The only viewing obstruction was insulation that had to be removed from around all five pressurizer penetration nozzles to perform the VT visual examinations.

c. The inspector determined that all pressurizer penetration nozzle inspections were conducted by qualified First Energy NDE personnel using direct visual inspections.

d. The inspector determined that all five of the pressurizer penetration nozzles were visually examined 360° around the circumference.

e. the inspector verified that the NDE inspection personnel that performed the direct VT examinations of the pressurizer penetration nozzles were capable of identifying and characterizing small boron deposits, as described in the Bulletin 2004-01.

f. The inspector verified that no evidence of boric acid leakage or material deficiencies (i.e., cracks, corrosion, etc.) were identified at any of the pressurizer penetration nozzles.

g. The inspector determined that the only impediment to the bare metal visual inspections was the installed insulation around the five pressurizer penetrations. Additionally, after removal of the insulation, the inspector verified that the observed penetrations were free of material that could have adversely affected viewing the pressurizer penetrations.

h/i. Not applicable. Since indications were not identified, surface or volumetric examinations, as well as follow-on examinations, were not conducted.

b. <u>Findings</u>

No findings of significance were identified.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. William Pearce and other members of management and staff on January 21, 2005. No materials reviewed during the inspection were identified by FENOC as proprietary.

ATTACHMENT 1: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

G. Alberti	Special Projects
M. Banko	Environmental Manager
D. Beerworth	Construction Services Supervisor
R. Boyle	System Engineer
G. Buck	Technical Services Engineering, NDE Level II
D. Canaan	Supervisor, Respiratory Protection
A. Castagnacci	Team Leader - Reactor Cavity Decontamination
R. Chesko	Special Projects
J. Clark	Senior Nuclear Specialist - Contamination Control
A. Crella	Supervisor - Dosimetry
G. Davie	Training Manager
J. Fontaine	Supervisor, Rad Operations
J. Freund	Supervisor, Rad Operations Support
W. Gregg	Senior Radiation Protection Technician
D. Grabski	Technical Services Engineering, ISI Engineer
T. Heimel	Technical Services Engineering, NDE Level III
K. Kimmerle	Supervisor, Portable Instruments
T. Kuhar	LOR Training Supervisor
J. Lash	Director, SIte Operations
J. Lebda	Senior Nuclear Specialist - Internal/External Dosimetry
R. Lieb	Manager, Plant Engineering
E. Loehlein	Technical Services Engineering
A. Lonnett	Senior Nuclear Specialist - Chemistry
D. McBride	System Engineer
J. Mauck	Regulatory Compliance
D. Mickinac	Regulatory Compliance, Operating Experience
M. Mulkerrin	System Engineer
R. Mueller	Operations, Shift Manager
R. Pattison	Senior Radiation Protection Technician
P. Pauvlinch	Engineering Supervisor
M. Pergar	Acting Oversight Manager
L. Pierce	Vice President - FENOC, Beaver Valley
R. Pucci	Senior Nuclear Specialsit - ALARA
G. Shildt	Supervisor, BOP System Engineering
P. Sena	Operations Manager
B. Sepelak	Supervisor Regulatory Compliance
J. Sipp	Radiation Protection Manager
P. Vakhara	Systems Engineer, Area Radiation Monitoring Systems
D. Wood	Operations Training Instructor

LIST OF ITEMS, OPENED, CLOSED, AND DISCUSSED

Closed

05000334,412/2004005-02	URI	Acceptability of licensee's LOR written exam development methodology (Section 4OA5)
05000334/2004001-00	LER	Control Rod Shutdown Bank Anomaly Causes Entry into Technical Specification (Section 4OA3)

Open/Closed

05000334/2004006-01	NCV	Failure to Take Adequate Corrective Actions to Preclude Repetitive Emergency Response Facility Emergency Diesel Generator Failures (Section 1R12)
05000412/2004006-02	NCV	Failure to Implement an Adequate TDAFW Pump Seal Packing Procedure (Section 1R15)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignments

Drawings

8770-RM-413-2, "Containment Depressurization System," Rev. 8
8770-RM-433-1, "Fire Protection - Water," Rev. 14
8770-RM-433-2, "Fire Protection - Water," Rev. 13
8770-RM-433-1A, "Fire Protection Water - Distribution Network," Rev. 16
8770-RM-433-1G, "Fire Protection Water - Distribution Network," Rev. 2

Procedures

1OM-13.3.B.2, "Valve List - 1RS," Rev. 7
1OM-13.3.C, "Power Supply and Control Switch List," Rev. 4
1OM-33.4.S, "Portable Fire Pump Operating While [1FP-P-1 and/or 2] are O.O.S," Rev. 4

Condition Reports

CR 03-06958

Section 1R12: Maintenance Rule Implementation

Drawings

8770-RE-1GB, “Emergency Response Facility Substation,” Rev. 7
8770-RE-21YN, “ERFS Diesel Generator No.1 Sh2,” Rev. 5
8770-RE-21YQ, “ERFS Diesel Generator No.1 Sh4,” Rev. 3
8770-RE-21GC, “480V One Line Diagram ERF Substation,” Rev. 9
10080-RE-1AB, “One Line Diagram Standby Diesel 480V Substation 2-5,” Rev. 8

Other

Technical Evaluation Report No. 11060, Rev. 0, Instruction Manual for the ERF EGD

Section 1R19: Post-Maintenance Testing

Drawings

RE-0021LN, Rev.0

Work Orders

WO 200082049
WO 200055016
WO 200057451

Procedures

1OM-24.4.ABR, “Feedwater Isolation Valve Local Panel Trouble,” Rev. 0

Other

BVPS License Requirements Manual, Rev. 41, Table 3.2-1 and Table 5.1-1

Section 1R20: Refueling and Outage Activities

Procedures

1RST-2.1, “Initial Approach to Criticality After Refueling,” Rev. 8
1RST-2.2, “Core Design Check Test,” Rev. 7
1OM-20.4.AAD, “Spent Fuel Pool Temp High,” Rev. 3
1OM-6.4.N, “Draining The RCS For Refueling,” Rev. 17
1CMP-47PH-P-2-1ME, “Removal and Reinstallation of Containment Equipment Hatch and Escape Air Lock, “ Rev. 9

1OM-10.4.A, “RHR System Startup And Operation,” Rev. 29
1OST-36.3, “Diesel Generator No. 1 Automatic Test,” Rev. 14
1OM-20.4.E, “Draining the Refueling Cavity,” Rev. 27
1OST-1.47.2B, “Containment Closeout,”
NOBP-OM-4010, “Restart Readiness For Plant Outages,” Rev. 1
NOP-OP-1005, “Shutdown Safety,” Rev. 7
1MSP-9.04-M, “Containment Sump Inspection,” Rev. 5

Drawings

8770-RM-406-1, “Reactor Coolant System,” Rev. 13
8770-RM-420-1, “Fuel Pool Cooling and Purification System,” Rev. 6

Other

1R16 Pre-Outage Shutdown Safety Review, Rev. 0

Section 1R23: Temporary Modifications

Drawings

8770-RM-409-1, “Vent and Drain System,” Rev. 12
8770-RM-414A-1, “Sample System,” Rev. 12

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Emergency Plan, Section 1, Rev 14
Emergency Plan, Section 2, Rev 14
Emergency Plan, Section 3, Rev 14
Emergency Plan, Section 4, Rev 17, 18
Emergency Plan, Section 5, Rev 19
Emergency Plan, Section 6, Rev 20, 21
Emergency Plan, Section 7, Rev 20
Emergency Plan, Section 8, Rev 19
Emergency Plan, Section 9, Rev 13

EPP/I-1a	Recognition and Classification of Emergency Conditions (Unit 1), Rev 5
EPP/I-1b	Recognition and Classification of Emergency Conditions (Unit 2), Rev 5
EPP-I-2	Unusual Event, Rev 20
EPP-I-3	Alert, Rev 19
EPP-I-4	Site Area Emergency, 19
EPP-I-5	General Emergency, 20
EPP-IP-1.1	Notifications, Rev 32
EPP-IP-1.4	Technical Support Center Activation, Operation and Deactivation, Rev 22, 23, 24
EPP-IP-1.5	Operations Support Center (OSC) Activation, Operation and Deactivation, Rev 16, 17

EPP-IP-2.1	Emergency Radiological Monitoring, Rev 13
EPP-IP-2.2	Onsite Monitoring for Airborne Release, Rev 14
EPP-IP-2.3	Offsite Monitoring for Airborne Release, Rev 15
EPP-IP-2.6	Environmental Assessment and Dose Projection Controlling Procedure Rev 16
EPP-IP-2.6.1	Dose Projection - Backup Methods, Rev 13
EPP-IP-2.6.11	Dose Projection - Miscellaneous Data, Rev 12
EPP-IP-3.1	Evacuation, Rev 9
EPP-IP-5.1	Search and Rescue, Rev 9
EPP-IP-5.4	Emergency Personnel Monitoring, Rev 10
EPP-IP-6.1	Re-entry to Affected Areas - Criteria and Guidelines, Rev 11
EPP-IP-6.2	Termination of the Emergency and Recovery, Rev 12
EPP-IP-7.2	Administration of Emergency Preparedness Plan Drills and Exercises, Rev 10
EPP-IP-7.3	Emergency Preparedness Testing, Rev 1, 2, 3
EPP-IP-8.1	Fires in Radiologically Controlled Areas, Rev 12
EPP-IP-9.3	Activation, Operation and Deactivation of Emergency Public Information Organization Emergency Operations Facility (EOF), Rev 7, 8
EPP-IP-.4	Activation, Operation and Deactivation of the Joint Public Information Center (JPIC), Rev 12
EPP-IP-9.5	Activation, Operation and Deactivation of the Penn Power Customer Account Services Department, Rev 9

Sections 2OA1, 2AO2, 4OA1, 4OA2:

Procedures:

Access Control to Radiologically Significant Areas (71121.01)and ALARA (71121.02)

1/2-ADM-1601, Rev 10	Radiation Protection Standards
1/2-ADM-1611, Rev 6	Radiation Protection Administrative Guide
1/2-ADM-1621, Rev 3	ALARA Program
1/2-ADM-1630, Rev 6	Radiation Worker Practices
1/2-ADM-1631, Rev 5	Exposure Control
1/2-HPP-3.02.003, Rev 3	Decontamination Control
1/2-HPP-3.02.004, Rev 2	Area Posting
1/2-HPP-3.04.002, Rev 3	Bioassay Administration
1/2-HPP-3.05.001, Rev 3	Exposure Authorization
1/2-HPP-3.07.002, Rev 3	Radiation Survey Methods
1/2-HPP-3.07.013, Rev 2	Barrier Checks
1/2-HPP-3.08.001, Rev 7	Radiological Work Permit
1/2-HPP-3.08.005, Rev 4	ALARA Review Program
BVBP-RP-0003. Rev 2	Dosimetry Practices
BVBP-RP-0013, Rev 1	Radiation Protection Risk Assessment Process
BVBP-RP-0016, Rev 0	Survey Requirement During Plant Transients

Nuclear Oversight Assessment Reports:

BV120041802, BV120041813, BV120041834, BV120041855, BV120041864, BV120041731, BV120041820, BV120041830, BV120041804

Condition Reports (22):

04-08646, 04-08433, 04-08231, 04-08314, 04-08652, 04-08700, 04-08172, 04-07783, 04-08222, 04-06561, 04-06569, 04-07168, 04-07170, 04-08664, 04-08686, 04-08687, 04-08690, 04-08694, 04-08698, 04-08699, 04-08704, 04-08709

Performance Indicator Verification Data (71151):

Occupational Exposure Control Effectiveness Data Forms
RETS/ODCM Radiological Effluent Occurrence Forms
BVBP-RAS-0006, PI Data Compilation and Submittal

Miscellaneous Reports:

Beaver Valley Long Range Personnel Radiation Exposure Reduction Plan
Beaver Valley 1R16 Outage ALARA Plan

Sections 2OA3, 4OA2:

Procedures:

1/2-HPP-4.01.007, Rev 0	Precision Electrometer - Model 500
1/2-HPP-4.01.011, Rev 0	Radioactive Source Standard Decay Correction
1/2-HPP-4.04.023, Rev 2	Eberline Personnel Contamination Monitor (PCM-2)
1/2-HPP-4.04.025, Rev 4	Calibration and Use of the Bicron SPM-906
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

Other Documents:

Site Radiation Monitoring System Status Report (September 2004)
Dry Active Waste Instrument Response Evaluation (August 2004)

Dosimetry Practices, Beaver Valley Business Practices (BVBP-RP-003, Rev 2)
Radiation Protection Performance Review Committee Presentation (August 2004)
Personnel Respirator Qualifications/Training Records
MSA Air Quality Records
Lesson Plan: Use of the MSA-401 SCBA
Lesson Plan: Use of the BioPak 240P

Condition Reports:

04-07538, 04-06859, 04-06261, 04-05763, 04-06195, 05-05673, 04-00649, 04-01778, 04-06161, 04-03894, 04-00657, 03-12216, 03-11460, 03-11112, 03-08192, 03-07508, 03-06333, 03-06140, 03-05697, 03-02052, 03-01774, 02-11402, 02-11494

Nuclear Quality Assessment Field Observation Reports:

BV32002602, BV220031182, BV32003766, BV32003837, BV12002471

Management Field Observations:

BVF2004-0906, BVF2004-1340, BVF2004-0487, BVF2004-1883, BVF2004-2619, BVF2004-2525

Section 4OA5 Other Activities:

Procedures

BVBP-RAS-013, Rev. 0	Industry Operating Experience Program
BVBP-RAS-0004, Rev. 1	Control of NRC Correspondence
NOP-LP-2100, DRAFT 02	Operating Experience Program
2OM-53C.4.2.30.1, Rev. 6	Service Water/Normal Intake Structure Loss
1OM-53C.4.1.30.2	River Water/Normal Intake Structure Loss
1OM-53A.1.2-O-AE (ISS1C), Rev. 0	Starting River Water Pump On Bus 1AE During Station Blackout
10M-33.4L, Rev. 2	Cross Connecting To River Water
10M-29.4.H, Rev. 2	Initiating River Water Backup Cooling to the Containment Air Recirculation Cooling Coils
2OST-30.13A	Train A Service Water System Full Flow Test
1OST-30.12A	Train A Reactor Plant River Water System Full Flow Test
1/2OST-30.19A	Main Intake Structure 'A' Bay Silt Check and Bay Cleaning
1/2ADM-2106	River/Service Water System Control and Monitoring Program
NPDAP 8.20	River/Service Water System Control and Monitoring Program
1BVT 02.30.09	Primary Component Cooling Water Heat Exchanger Thermal Performance Test
1BVT 02.30.07	Charging Pump Lube Oil Cooler Heat Exchanger Thermal Performance Test
1BVT 02.30.08	Diesel Cooling Water Heat Exchanger Thermal Performance Test

2BVT 02.30.08	Diesel Generator Intercooler and Jacket Water Cooler Thermal Performance Test
2BVT 02.30.07	Charging Pump Lube Oil Cooler Heat Exchanger Thermal Performance Test
NOP-ER-2001	Boric Acid Corrosion Control Program, Revision 4
1&2-ADM-2112	Boric Acid Corrosion Control, Revision 3
NDE-VT-510	Visual Inspection for Evidence of Boric Acid Leakage, Revision 11
NOP-LP-2001	Condition Report Process, Revision 7
WDI-ET-002	Intraspect Eddy Current Inspection of J-Groove Welds in Vessel Head Penterations, Rev 5
WDI-ET-003	Intraspect Eddy Current Imaging Procedure for Inspection of Reactor Vessel Head Penetrations, Rev 7
WDI-UT-010	Intraspect Ultrasonic Procedure for Inspection of Reactor Vessel Head Penetrations, Time of Flight Ultrasonic, Longitudinal Wave and Shear Wave, Rev 8

Modifications

DCP 2152	River Water/Service Water Chemical Injection System (Intake Structure)
DCP-2424	BV-1 Replacement River Water Pumps and Motors
DCP-1502	BV-2 Modifications for Heat Exchanger Performance Monitoring

Licensee Event Reports (LER)

2002-001-00	Service Water Conditions for the Recirculation Spray System Lead to Technical Specification Noncompliance
1999-007-00	Forced Shutdown Due to Inoperable Emergency Diesel Generator

Miscellaneous

BVPS Response Letter to GL89-13, dated January 29, 1990
BVPS Second Response Letter to GL89-13, dated June 27, 1991

2PL-018, Rev. 6a	Service Water Supply to Auxiliary Feed Pump Suction
1PL-071, Rev. 0	Switchgear Chiller (1VS-E-40A) Failure
1CR-090, Rev. 3a	Respond to a Loss of Secondary Heat Sink per FR-H.1
2PL-060, Rev. 5	Backup Seal Water to 2SW*P21A
1st Quarter 2000	Service Water/Standby Service, System Health Report
2nd Quarter 2004	River Water, System Health Report
2nd Quarter 2004	Service Water/Standby Service, System Health Report
8700-DMC-1589	Silt Build-up Depth on Main Intake Bay

Basis for Continued Operation 1-03-004/2-03-001

P&ID 10080-RM-430-1	Service Water Supply and Distribution
P&ID 10080-RM-430-2	Service Water Primary Cooling

BV-1 Heat Exchanger Inspection Reports for 1CC-E-1A/B, 1EE-E-1A/B, 1CH-E-7A/B/C, 1RS-E-1A/B/C/D, 1VS-E-14A/B

BV-2 Heat Exchanger Inspection Reports for 2CCP-E-21A/B/C, 2CHS-E25A/B/C, 2EGS-E21A/B, 2EGS-E22A/B, 2HVC-ACU-201A/B, 2HVC-REF-24A/B, 2HVP-ACUS-301, 2HVP-CLC-265A/B, 2HVR-ACU-207A/B, 2RSS-E21A/B/C/D, 2SWS-RQI-100A/B/C/D

BVPS DBAR April-June 2004

BV-SA-00-48	Chemical Control of River Water, Service Water and Circulating Water Systems
BV-SA-00-70	Asiatic Clam and Zebra Mussel Control Program
BV-SA-02-59	Latent Issues Review Year 2001 Effectiveness Review
BVPS-1 USFAR Section 9.9	River Water Systems
BVPS-1 1DBD-30	Design Basis Document for River Water, Auxiliary River Water, and Raw Water Systems

BVPS-1 and 2 Technical Specification Section 3/4.7.5, Ultimate Heat Sink

BVPS-2 2DBD-30	Design Basis Document for Service Water System
BVPS-2 USFAR Section 9.2	Water Systems
BVPS-2 2BVT 02.30.07	Charging Pump Lube Oil Cooler (2CHS-E25A, B, or C) Heat Exchanger Thermal Performance Testing

BV TI 2515/159 Inspection Readiness Review Report

Heat Exchanger Inspection Data for 2EGS-E21A and 2EGS-E22A

RW/SW Maintenance Data - Various

BV-SA 04-07	Heat Exchanger Program Self Assessment

ISI Drawings

8700-ISI-0348 D, 8700-ISI-0350 A-3, 8700-ISI-0350 B-3	Pressurized Spray & Safety Relief Tank Piping Reactor Containment Building Drawings

Other Documents

A5.5511E	Eye Examination Certification Form
RTL A5.611A	Certificate of Qualification Form
RC-72-7-E-01	Fabrication # X-1174-E-T-Nozzle E, RT Safe End to Nozzle Before SR, 12/23/1970
RC-72-7-E-01	Fabrication # X-1174-E-T-Nozzle E, RT Safe End to Nozzle After SR, 01/06/1971
RC-104-1-E-01	Fabrication # X-1174-D-T-Nozzle D, RT Safe End Nozzle Before SR, 12/23/1970
RC-104-1-E-01	Fabrication # X-1174-D-T-Nozzle D, RT Safe End Nozzle After SR, 01/06/1971
RC-104-1-E-01	Surface Evaluation Report EV-97-006, Exam Report No. PT-97-080, 10/23/1997
RC-72-7-E-01	Ultrasonic Examination Report No. UT 89-293, 9/30/1989
Isometric 44	Weld 52, Loop #3 Cold Leg 4 Pressurizer Spray, Weld Ultrasonic Examination Report, 3/10/1975
CR 03-06263	Containment Entry on 5/13/03 to Locate Source of RCS Leakage
1/2-ADM-2112	Beaver Valley Power Station Unit ½ Boric Acid Corrosion Control" Revision 3
WCAP-16144-P	Structural Integrity Evaluation of Reactor Vessel Upper Head Penetrations to Support Continued Operation: Beaver Valley Unit 2 Westinghouse Report Revision 0
WCAP-15919-P	Steam Generator Tube Repair for Westinghouse Designed Plants with 7/8 Inch Inconel 600 Tubes Using Leak Limiting Alloy 800 Sleeves Westinghouse Report
L-04-029	Year 2003 Steam Generator Examination Reports March 3, 2004 Unit 1, 15th refueling outage March '03
L-03-113	Cycle 16 Steam Generator Tube Inspection 90 Day Report,, July 24, 2003 a.k.a. Westinghouse Report SG-SGDA-03-05 Cycle 16 Voltage-Based Repair Criteria 90 Day Report.
LAR No. 328,	Revised Steam Generator Inspection Scope for One Cycle of Operation.
WCAP-14797-P	Generic W* Tube Plugging Criteria for 51 Series Steam Generator Tubesheet Region WEXTEX Expansions, Rev 2, March 2003
LAR No. 322,	Steam Generator Tube Repair Using Ally 800 Sleeves.
SG-SGDA-03-31	Beaver Valley Unit 1 Cycle 16 Steam Generator Operational Assessment, July '03
MRS-TRC-1570	Use of Appendix H Qualified Techiques 1R16 Refueling Outage, August 2004
WDI-UT-013	CRDM/ICI Analysis Guidelines, Rev 6

GT/SM-01-A	Welding Technique Sheet 1 Rev 2
CR 03 09445	Mode Hold Forms
CR 03 09455	Mode Hold Forms
CR 04 07768	Mode Hold Forms

Condition Reports

00-0142	03-06452	04-03446	04-07495	02-07220
00-0531	03-07157	04-6276	04-07470	03-05848
00-1633	03-08551	04-01781	04-07275	03-05853
00-3827	03-11098	04-03909	04-06901	04-03311
01-8420	04-03324	04-04952	04-05808	04-06898
03-04837	03-11683	04-07490	03-00541	
03-05870	04-06903	04-07471		

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
AR	ALARA Review
ASME	American Society of Mechanical Engineers
BVPS	Beaver Valley Power Station
CR	Condition Report
EDG	Emergency Diesel Generator
ERF	Emergency Response Facility
EPRI	Electric Power Research Institute
ETTS	Eddy Current examination technique specification sheets
FENOC	First Energy Nuclear Operating Company
HRA	High Radiation Area
LCO	Limiting Condition for Operation
MR	Maintenance Rule
NEI	Nuclear Energy Institute
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
OD	Operability Determination
PCM	Personnel Contamination Monitor
PCR	Personnel Contamination Report
PMT	Post-Maintenance Test
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RWP	Radiation Work Permit
SAM	Small Article Monitor
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SSC	Structures, System, and Component
TDAFW	Turbine Driven Auxiliary Feedwater
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Area
VT	Visual Examination
WO	Work Order

ATTACHMENT 2: TI 2515/159 - Review of Generic Letter 89-13: Service Water System Problems Affecting Safety-Related Equipment

a.1. The effectiveness of GL 89-13 in communicating information

Generally, Generic Letter (GL) 89-13 was effective in communicating the importance of understanding RW and SW system health and increasing awareness with respect to implementing maintenance and testing programs to ensure design basis and operability were maintained. It provided a foundation of recommended practices that contributed to improving overall performance of these risk significant systems, as well as maintaining high performance. GL 89-13 has also increased Beaver Valley station management awareness to RW and SW issues to ensure support for system improvements.

a.2. Licensee actions that are being implemented for the five recommended actions of GL 89-13

FENOC has implemented all five recommended actions of GL 89-13: (1) FENOC has effectively implemented a surveillance program for biofouling to minimize flow blockage problems; (2) FENOC has instituted a program of regular maintenance of safety-related heat exchangers in lieu of periodic testing, which is acceptable per GL 89-13. The frequency of the maintenance activity, which consists of inspection and cleaning, was adequately established through administrative and maintenance procedures; (3) FENOC's maintenance program ensured, as a minimum, that (a) excessive accumulations of biofouling agents, corrosion products, and silt were removed and (b) corroded RW and SW system piping and components that could adversely affect performance of their intended safety functions were repaired; (4) FENOC has completed design bases documents to ensure that RW and SW system design and operability would be assured under all accident conditions; and (5) Overall, the inspectors found that FENOC's procedures and training were acceptable to ensure that operators perform effectively and minimized human errors in operation, repair, and maintenance of the RW and SW systems.

Overall, the inspectors concluded the five recommended actions were being implemented. However, the team noted some minor examples where FENOC's actions deviated from their commitments to GL 89-13 or were not meeting FENOC program guidelines. These issues are discussed in section a.3. below. They were determined not to be violations of regulatory requirements.

a.3. Effective programmatic maintenance of the actions in response to GL 89-13.

Overall, FENOC has maintained effective GL 89-13 programs and procedures to meet their GL 89-13 commitments. The inspectors noted aspects of the GL 89-13 recommendations that have shown improvement. However, there were also examples that indicate areas where actions in response to GL 89-13 commitments have not been maintained as effective as desired.

- FENOC has improved the RW and SW system reliability by replacing significant portions of small and medium bore carbon steel piping that was subject to pinhole leaks and under-deposit corrosion.

- FENOC committed to conducting heat exchanger performance testing in its GL 89-13 response letter, but later found that the testing program was not practical. FENOC adopted the acceptable alternate action, which is frequent, regular maintenance. However, FENOC did not revise or update the GL 89-13 response letter to reflect this change in approach.

- FENOC's bases for heat exchanger maintenance and cleaning frequencies were not well supported. For example, some heat exchangers were cleaned on a 18-month frequency and others were cleaned at a different frequency. FENOC had begun addressing this discrepancy through self assessment activities.

- Based on additional industry experience, FENOC had recently begun baseline performance testing of heat exchangers as an enhancement to the GL 89-13 program.

a.4. As applicable, noteworthy SW System operational history that supports inspection results.

The inspectors noted the following events and issues related to RW and SW operational history:

- In 1999, significant biofouling of a Unit 2 emergency diesel generator heat exchanger rendered the diesel inoperable.

- In 2000, there were two events that impacted RW and SW reliability. First, thermal binding affected the operability of the Unit 1 river pumps, and secondly, the Unit 2 'C' service water pump discharge expansion joint failed due to a vacuum break check valve failure.

- The inspectors noted that on several occasions, FENOC found the Unit 2 primary component cooling heat exchangers fouled significantly during inspections. On a few occasions the heat exchangers exceeded delta pressure limits and had to be taken out of service for cleaning. Appropriate corrective actions were taken for these occurrences.

a.5. Effectiveness assessment of licensee's program procedure(s) on related SWS operating experience.

The inspectors determined that FENOC's operating experience program and its implementation were adequate to maintain RW and SW system functionality. Several operating experience items were reviewed and found to have been evaluated appropriately. The inspectors observed that relevant industry operating experience has been incorporated into the appropriate training programs.