UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

May 13, 2011

Mr. Paul Harden
Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
P. O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC INTEGRATED INSPECTION REPORT 05000334/2011002 AND 05000412/2011002

Dear Mr. Harden:

On March 31, 2011, 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 results, which were discussed on May 4, 2011, with you and other members of your staff.

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

Based on the results of this inspection, this report documents two (2) self-revealing findings of very low safety significance (Green). The findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program (CAP), the NRC is treating them as a non-cited violations (NCVs), consistent with Section 2.3.2 of the NRC's Enforcement Policy.

If you contest any of the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Beaver Valley. In addition, if you disagree with the characterization of the cross-cutting aspect of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region 1 and the NRC Senior Resident Inspector at the Beaver Valley Power Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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 610-337-5200 if you have any questions regarding this letter.

Sincerely,

Barbara Fox

Ronald R. Bellamy, Ph.D., Chief
Reactor Projects Branch 6
Division of Reactor Projects

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

Enclosures: Inspection Report 05000334/2011002; 05000412/2011002
w/ Attachment: Supplemental Information

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Sincerely,

/RA by Scott Barber Acting for/

Ronald R. Bellamy, Ph.D., Chief
Reactor Projects Branch 6
Division of Reactor Projects

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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.	05000334/2011002 and 05000412/2011002
Licensee:	FirstEnergy Nuclear Operating Company (FENOC)
Facility:	Beaver Valley Power Station, Units 1 and 2
Location:	Shippingport, PA 15077
Dates:	January 1, 2011 through March 31, 2011
Inspectors:	D. Werkheiser, Senior Resident Inspector E. Bonney, Resident Inspector P. Kaufman, Senior Reactor Inspector T. Moslak, Health Physicist T. Ziev, Reactor Engineer
Approved by:	R. Bellamy, Ph.D., Chief Reactor Projects Branch 6 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000334/2011002, IR 05000412/2011002; 01/01/2011 – 03/31/2011; Beaver Valley Power Station, Units 1 & 2; Outage Activities and Problem Identification and Resolution.

The report covered a 3-month period of inspection by resident inspectors, regional reactor inspectors, and a regional health physics inspector. Two (Green) findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within The Cross-Cutting Areas," dated February 2010. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstone: Mitigating Systems

- Green. A Green, self-revealing non-cited violation (NCV) of TS 5.4.1, "Procedures", was identified in that technicians inadvertently caused an auxiliary feedwater actuation when the plant was shutdown for refueling. Specifically, the procedure used to inject simulated steam generator water signals was inadequate, which resulted in the technicians erroneously inserting two-of-three (2/3) Low-Low level signals to the SGs and causing actuation of auxiliary feedwater. This issue was entered into the licensee's corrective action program under CR 11-90528.

  Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of NRC requirements. The finding is more than minor because it is similar to example 4.b in IMC 0612, Appendix E.

  The inspectors performed a Phase 1 SDP evaluation in accordance with IMC 0609, Appendix G, Attachment 1, Checklist 2 "PWR Cold Shutdown Operation: RCS Closed and SGs Available for DHR (Loops Filled and Inventory in Pressurizer) Time to Boiling Less than 2 Hours." There was no loss of control, and all mitigating capabilities were available, therefore a Phase 2 quantitative assessment was not required and the issue screened to Green (very low safety significance).

  The cause of this NCV relates to the cross-cutting aspect of Human Performance, Work Control, in that FENOC personnel did not appropriately coordinate work activities by incorporating actions to address the need to communicate, coordinate and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance.[H.3.(b)] (Section 1R20)

- Green. A Green, self-revealing non-cited violation (NCV) of TS 5.4.1, "Procedures", was identified in that chemistry procedures failed to provide adequate detail to ensure timely completion of TS required sampling of the spray additive system. Specifically, FENOC failed to complete timely sampling and analysis of the chemical addition tank, resulting in reasonable doubt of the operability of the spray additive system for 13 days. The issue was entered into the licensee's corrective action program under CR 10-87438.

Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of NRC requirements. The finding is more than minor because it is similar to example 3.j in IMC 0612, Appendix E and it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affects the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

In accordance with IMC 0609.04 (Table 4a), Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the finding was not a design or qualification deficiency which resulted in a loss of safety function.

The cause of this NCV relates to the cross-cutting aspect of Problem Identification and Resolution, Corrective Action Program, in that FENOC personnel did not implement a corrective action program with a low threshold for identifying issues. FENOC did not identify the issue completely, accurately and in a timely manner commensurate with its safety significance.[P.1.(a)] (Section 4OA2)

REPORT DETAILS

Summary of Plant Status:

Unit 1 began the inspection period at 100 percent power. On February 5, the unit was down-powered to 97 percent for turbine throttle and governor valve maintenance. The unit returned to full power the same day and remained at 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On February 5, the unit was down-powered to 97 percent for planned turbine throttle valve and governor valve testing and returned to full power the same day. On March 5, the unit down-powered to 82 percent in preparation for steam generator safety valve testing, and then continued to unit shutdown and began a planned refueling outage on March 7. The unit remained shutdown in a refueling outage for the remainder of the inspection period.

1. REACTOR SAFETY
Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity [R]

1R01 Adverse Weather Protection (71111.01)

Adverse Weather

a. Inspection Scope (2 samples)

February 22-March 28 - High Ohio River Level

The inspectors evaluated FENOC's preparation, protection, and actions from the effects of external flooding conditions for Unit 1 and Unit 2 during actual high Ohio River water conditions observed February 22 - March 28. This evaluation focused on review of specific unit actions based on actual environmental conditions. The inspectors performed walkdowns of the affected unit's external structures to verify the adequacy of protection from the high river water that could potentially impact safety-related equipment and reviewed expected licensee actions based on abnormal operating procedure (AOP) 1/2OM-53C.4A.75.2, "Acts of Nature – Flood."

March 23 - Tornado Watch

The inspectors evaluated FENOC's preparation, protection, and actions from the effects of sustained high winds to Unit 1 and Unit 2 during a tornado watch and high wind advisory. The inspectors' efforts focused on review of specific unit actions based on actual environmental conditions and adherence to mitigating procedures. The inspectors performed walkdowns of each unit's external structures and emergency response facilities to verify the adequacy of protection from high winds, readiness for use, and continuity of power. Areas which could potentially impact safety-related equipment were also walked down. The inspectors reviewed expected licensee actions based on abnormal operating procedure (AOP) 1/2OM-53C.4A.75.1, "Acts of Nature – Tornado or High Winds."

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial System Walkdowns (71111.04Q)

a. Inspection Scope (4 samples)

The inspectors performed four (4) partial equipment alignment inspections during conditions of increased safety significance, including when redundant equipment was unavailable during maintenance or adverse conditions. The partial alignment inspections were also completed after equipment was recently returned to service after significant maintenance. The inspectors performed partial walkdowns of the following systems, including associated electrical distribution components and control room panels, to verify the equipment was aligned to perform its intended safety functions:

- On January 27, Unit 1, control room emergency ventilation system upon discovery of a pinhole peak;
- On March 18, Unit 2, 'B' train Emergency Diesel Generator (EDG) during 'AE' 4 kV bus outage;
- On March 22, Unit 2, 'B' recirculating spray system temporary chemical addition system; and
- On March 28, Unit 2, 'A' train service water system during 'B' train service water system planned maintenance.

b. Findings

No findings were identified.

.2 Complete System Walkdown (71111.04S)

a. Inspection Scope (1 sample)

On March 22nd, the inspectors completed a detailed review of the alignment and condition of the Unit 2 'A' and 'B' residual heat removal system following planned maintenance. The inspectors conducted a walkdown of the system to verify that the critical portions, such as valve positions, switches, and breakers, were correctly aligned in accordance with procedures, and to identify any discrepancies that may have had an effect on operability.

The inspectors also reviewed outstanding maintenance work orders to verify that the deficiencies did not significantly affect the residual heat removal system function. In addition, the inspectors discussed system health with the system engineer and reviewed the condition report database to verify that equipment alignment problems were being identified and appropriately resolved. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q)

a. Inspection Scope (5 samples)

The inspectors reviewed the conditions of the fire areas listed below, to verify compliance with criteria delineated in Administrative Procedure 1/2-ADM-1900, "Fire Protection," Rev. 23. This review included FENOC's control of transient combustibles and ignition sources, material condition of fire protection equipment including fire detection systems, water-based fire suppression systems, gaseous fire suppression systems, manual firefighting equipment and capability, passive fire protection features, and the adequacy of compensatory measures for any fire protection impairments. Documents reviewed are listed in the Attachment:

- Unit 2, Reactor Containment Building (Fire Area RC-1);
- Unit 2, 'AE' Emergency Switchgear Room (Fire Area SB-1);
- Unit 2, 'DF' Emergency Switchgear Room (Fire Area SB-2);
- Unit 1, Fuel Handling Building (Fire Area FB-1); and
- Unit 1, Control Room (Fire Area CR-1).

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope (1 sample)

The inspectors reviewed a sample of internal flood protection measures regarding cables located in underground manholes and related to CR 10-87161, "1DA-P-M8A Submersible Pump Repeat Failures." Manhole 8A contains Unit 1 and Unit 2 safety-related power and control cables near the intake structure and is located below grade.

This review was conducted to evaluate FENOC's protection of the enclosed safety-related systems from internal flooding condition. The inspectors performed a walkdown of the area, reviewed the UFSAR, related internal flooding evaluations, and other related documents. The inspectors examined the as-found equipment and conditions to ensure that they remained consistent with those indicated in the design basis documentation, flooding mitigation documents, and risk analysis assumptions. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R08 Inservice Inspection (71111.08P)

a. Inspection Scope (1 sample)

From March 14 - 23, the inspectors conducted a review of FENOC's implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system boundary and risk significant piping system boundaries for Beaver Valley Power Station (BVPS) Unit 2. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage. The inspector reviewed documentation, observed in-process non-destructive examinations (NDE) and interviewed inspection personnel to verify that the activities were performed in accordance with the requirements of 10 CFR50.55a, ASME Boiler and Pressure Vessel Code Section XI, 2001 Edition, 2003 Addenda, Materials Reliability Program MRP-139, and BVPS risk informed in-service inspection program.

Non-Destructive Examination (NDE) Activities

The inspector performed observations of NDE activities in process and reviewed documentation of the nondestructive examinations listed below:

- Direct inspection and review of test results of automated and manual Ultrasonic Test (UT), volumetric examination of Unit 2 containment liner thickness at random location 2RN-40, UT examination report nos. BOP-UT-11-083 and BOP-UT-11-085, both dated 03/22/2011 and manual UT of random location 2RN-067, UT examination report no. UT-11-1046, dated 03/18/2011.

- Record and photographic review of visual examination of Unit 2 Reactor Pressure Vessel (RPV) lower head Bare Metal Inspection (BMI) of the 50 nozzles report no. VT-11-1046, dated 03/22/2011 and direct remote observation of visual inspection of RPV upper head BMI and control rod drive mechanism (CRDM) 65 nozzle penetrations and head vent penetration, 2R15 per work order 200399866, and dated 03/12/2011.

- Direct remote observation of a sample of automated UT examination of RPV upper head CRDM nozzles per work order 200399865, dated 3/29/2011 and review of RPV head penetration inspection final report WDI-PJF-1304795-FSR-001, Beaver Valley Unit 2, 2R15, dated March, 2011.

- Direct inspection and review of examination record of Liquid Penetrant Test (PT), surface examination, pressurizer integral attachment lug welds, PT examination report no. PT-11-1002, dated 03/17/2011.

- Record review of PT surface examination record BOP-PT-11-027, component cooling inlet socket weld to reactor coolant pump, 2RCS-P21A, dated 3/17/2011.

- Record review of manual UT pipe butt weld examination record UT-11-1009, 2QSS-1-5B, dated 3/12/2011.

- Record review of visual examinations of three hot leg and one cold leg dissimilar metal butt welds nozzle-to-safe-ends VT-2 visual examination report nos. VT-11-1025, VT-11-1026, VT-11-1027, and VT-11-1028 all dated 03/11/2011.

- Record review of manual UT, volumetric vessel examination of component ID, 2RCS*SG21B-C-03 shell circumferential weld #3, UT examination report no. UT-11-1065, dated 03/22/2011.

The inspectors reviewed certifications of several technicians performing non-destructive examinations and verified that the examinations were performed in accordance with approved procedures and inspection records appropriately evaluated by certified Level III NDE personnel.

There were no samples available for review during this inspection that involved examinations with recordable indications that have been accepted for continued service from the previous Unit 2 outage 2R14 through 2R15 outage.

Unit 2 Reactor Pressure Vessel Upper Closure Head Penetration Inspection Activities

The inspectors directly observed portions of the remote bare metal visual inspection of the Unit 2 RPV upper closure penetration nozzles to head penetrations with alloy 600/82/182 material and reviewed portions of the visual examination video recording to confirm appropriate coverage was achieved and verified that no boric acid leakage or wastage had been observed on the RPV upper closure head surface to verify that the visual inspection was conducted in accordance with in accordance with10 CFR 50.55a(g)(6)(ii)(D) associated with ASME Code Case N-729-1.

The inspectors remotely observed a sample of automated UT examinations of RPV upper head CRDM #65 nozzle penetration and a sample of the PT examinations performed on the inside diameter surface of the reactor vessel head for all six previously repaired penetrations. During PT examinations of penetration #56, indications were identified with the weld overlay that required a repair during 2R15. The inspectors remotely observed a portion of the manual weld repair to the weld overlay of Unit 2 RPV upper closure head penetration nozzle #56 that had previously been repaired by a weld overlay during 2R13 in 2006. During this weld repair process the inspectors also participated in FENOC's conference call with NRR on March 22, 2011 to discuss the indications found during PT of penetration #56 and proposed repair activities.

Repair/Replacement Consisting of Welding Activities

The inspectors directly observed and reviewed the weld repair to weld overlay of Unit 2 RPV upper closure head penetration nozzle #56 during 2R15 to verify the welding and applicable NDE activities were performed in accordance with ASME Section III, V, and XI Code requirements.

Unit 2 Reactor Pressure Vessel Lower Head Penetration Nozzle Inspection Activities

The inspectors verified the bare metal visual inspection results were acceptable of the alloy 600 BMI exams of the Unit 2 RPV lower head instrument nozzle penetration welds conducted by licensee personnel per procedure NDE-VT-513 during 2R15 by reviewing

visual examination photographs and VT-2 leakage record VT-11-1046 of the BMI inspection. The inspectors verified no leakage was identified at any of the penetrations.

Boric Acid Corrosion Control (BACC) Inspection Activities

The inspectors reviewed Beaver Valley's boric acid corrosion control program and discussed the program with the program owner, and sampled condition reports and photographic inspection records of boric acid deposits on safety significant piping and components inside the Unit 2 containment during walkdowns conducted by FENOC personnel that was observed by the NRC resident inspectors during initial containment entry walkdowns conducted on March 7, 2011 during 2R15. The inspectors observed the licensee's identification and documentation of boric acid leaks with emphasis on areas that could cause degradation of safety significant components.

The inspectors verified that potential deficiencies identified during the boric acid walkdowns were appropriately entered into the corrective action program and reviewed condition reports CR 11-91146, 2RCS-P21A pump seal and CR 11-90555, 2CHS-MOV201 excess letdown heat exchanger inlet valve to verify that the corrective actions were consistent with the requirements of station procedures, ASME Section XI, and 10 CFR 50, Appendix B, Criterion XVI. The inspector also reviewed engineering evaluations for CR 11-90519, 2RCS-PCV456 pressurizer PORV, and CR 11-91146, 2RCS-P21A pump seal to verify that equipment or components that were wetted or impinged by boric acid solutions were properly analyzed for degradation that might impact their associated design basis functions.

Steam Generator (SG) Tube Inspection Activities

The inspectors reviewed the Unit 2 SG eddy current testing (ECT) tube examinations, and applicable procedures for monitoring degradation of SG tubes to verify that the SG examination activities were performed in accordance with the rules and regulations of the SG examination program, Beaver Valley Unit 2 SG examination guidelines, Code of Federal Regulations 10CFR50, TSs for Unit 2, Nuclear Energy Institute (NEI) 97-06, EPRI PWR SG examination guidelines, and the ASME Boiler and Pressure Vessel Code Sections V and XI. The review also included the Beaver Valley Unit 2 SG degradation assessment report (SG-SGMP-11-4) and Cycle 15 SG operational assessment (SG-SGMP-10-5) for 2R15 outage. ECT of one hundred percent of the in-service tubes in the three SGs were examined during the 2R15 refueling outage.

The inspectors reviewed plant specific SG information, tube inspection criteria, integrity assessments, degradation modes, tube sleeving license amendment, and tube plugging criteria. The inspectors discussed the in-process ECT inspection activities with the data management and the data acquisition personnel and the resolution analysts and observed a sample of the SG tubes being examined. The inspectors verified that the eddy current analysts were qualified and confirmed to be prepared for the specific site conditions for the Unit 2 SGs by applicable testing. The independent quality data analyst (IQDA) work scope was reviewed to confirm the extent of independent oversight of the eddy current testing process.

The inspectors participated in FENOC's outage conference call with NRR on March 21, 2011 to discuss the Unit 2 SG tube examination results obtained and a status summary

of eddy current inspections up to that time. No primary-to-secondary leakage was observed by FENOC during the recently completed cycle (EOC15) and no sleeving was performed during the 2R15 outage.

The inspectors observed in-situ full length pressure testing of SG "C" Row 29 Column 12 a peripheral tube because the tube contained large amplitude permeability variation (PVN) signals extending for large distances between the 4th cold leg tube support plate and the 7th hot leg tube support plate which successfully passed the required pressure testing. The inspectors reviewed a sample examination data records for selected tubes and the characterization and disposition of the identified flaws, including stabilizing and plugging of various tubes in each SG to verify the steam generator inspection monitoring program was implemented in accordance with the rules and regulations of the steam generator examination program.

Problem Identification and Resolution

The inspector reviewed a sample of Unit 2 condition reports, which identified flaws and other nonconforming conditions since the previous 2R14 outage and during the 2R15 outage. The inspector verified that nonconforming conditions were properly identified, characterized, evaluated, corrective actions identified and dispositioned, and appropriately entered into the corrective action program.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope (1 sample)

On February 9th and March 4th, the inspectors observed a sample of Unit 2 licensed operator requalification simulator training which included Unit 2 training for the planned shutdown, cool down and depressurization of Unit 2. The inspectors evaluated licensed operator performance regarding command and control, implementation of normal, annunciator response, abnormal, and emergency operating procedures, communications, technical specification review and compliance, and emergency plan implementation. The inspectors evaluated the licensee staff training personnel to verify that deficiencies in operator performance were identified, and that conditions adverse to quality were entered into the licensee's corrective action program for resolution. The inspectors reviewed simulator physical fidelity to assure the simulator appropriately modeled the plant control room. The inspectors verified that the training evaluators adequately addressed that the applicable training objectives had been achieved.

b. Findings

No findings were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope (2 samples)

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

- On January 18, Unit 1, CR 11-88180, "Maintenance Rule Performance Criteria for System 01 (Reactor Control and Protection System) was Exceeded;" and
- On January 20, Unit 1, CR 11-88460, "Safety System Functional Failures Below 50% to NRC Green Limit."

b. Findings

No findings were identified.

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

a. Inspection Scope (6 samples)

The inspectors reviewed the scheduling and control of six (6) activities, and evaluated their effect on overall plant risk. This review was conducted to ensure compliance with applicable criteria contained in 10 CFR 50.65(a)(4). Documents reviewed during the inspection are listed in the Attachment.

- Week of January 10, Unit 2, initial risk evaluation and subsequent work rescheduling resulting in green risk involving battery 2-3 and switchyard work;
- On February 2, Unit 1, risk evaluation for 1-1 EDG monthly surveillance test after entry into High Winds Abnormal Operating Procedure (AOP);
- On February 10, Unit 2, planned yellow risk entry during A train SIS Testing;
- On March 8, Unit 2, unplanned yellow risk entry for 2-2 EDG relay troubleshooting;
- On March 9, Unit 2, unplanned yellow risk entry for barring of 2-1 EDG; and
- On March 25-27, Unit 2, risk management with the 2-1 and 2-2 EDGs inoperable.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (6 samples)

The inspectors evaluated the technical adequacy of selected immediate operability determinations (IOD), prompt operability determinations (POD), or functionality assessments (FA), to verify that determinations of operability were justified. In addition, the inspectors verified that technical specification (TS) limiting conditions for operation (LCO) requirements and UFSAR design basis requirements were properly addressed. In addition, the inspectors reviewed compensatory measures implemented to ensure the measures worked and were adequately controlled. Documents reviewed are listed in the Attachment.

- On January 18, Unit 2, service water leak in north safeguards building as documented in POD 11-88199;
- On January, 21 Unit 1 and 2, 10CFR21 review regarding ABB COM overcurrent style relays as documented in CR 11-88499;
- On February 17, Unit 1, 'B' river water 2" line through-wall leak as documented in POD 11-89270;
- On February 24, Unit 2, 'B' recirculating heat exchanger (2RSS-E21B) low flow as documented in POD 11-90096;
- On March 12, Unit 2, integrity of air start piping due to high lift pressure of system relief valve as documented in CR 11-90824; and
- On March 16, Quadrant Power Tilt Ration (QPTR) alarm operability as documented in CR 11-91115.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope (3 samples)

The inspectors reviewed the following permanent and temporary modifications based on risk significance. The permanent modifications and associated 10 CFR 50.59 screenings were reviewed against the system design basis documentation, including the UFSAR and the TS. The inspectors verified that attributes and parameters within the design documentation were consistent with required licensing and design bases, as well as credited codes and standards, and walked down the systems to verify that changes described in the package were appropriately implemented. The inspectors verified the temporary modifications were implemented in accordance with Administrative (ADM) Procedure, 1/2-ADM-2028, "Temporary Modifications," Rev. 6. The inspectors also verified the post-modification testing was satisfactorily accomplished to ensure the system and components operated consistent with their intended safety function. Documents reviewed are listed in the Attachment.

- On March 3, Unit 2, spent fuel pool cask-area fuel storage rack installation, ECP 10-0590;
- On March 8, Unit 2, 2-2 EDG relay changes, ECP 11-0148; and

- On March 21, Unit 2, temporary jumper from MCC-2-E05 to MCC-2-E06 to power spent fuel pool cooling pump.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope (7 samples)

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

- On January 29, Unit 1, WO 200447414 after control room ventilation duct repairs to 1VS-FL-1;
- On January 31, Unit 1, calibration of channel IV of loop 2 feedwater flow after card replacement;
- On February 7, Unit 2, WO 200400086 after repairs to service water pump seal injection water and motor cooling strainer, 2SWS-STRM47;
- On March 7, 2OST-36.4, after sequencer timing relay ECP change;
- On March 10, Unit 2, WO 200450791 after repairs to address failed 2OST-11.4A;
- On March 25, WO 200451265 retest of LHSI to HHSI suction cross-connect valve, 2SIS-MOV863A; and
- On March 26-27, 2OST-36.1, after replacement of 'A' EDG fuel supply lines.

b. Findings

No findings were identified.

1R20 Refueling and Outage Activities (71111.20)

.1 Unit 2 Refueling Outage (2R15)

a. Inspection Scope (partial sample)

The inspectors observed selected outage activities to determine whether shutdown safety functions (e.g. reactor decay heat removal, spent fool pool cooling, and containment integrity) were properly maintained as required by TS and plant procedures. The inspectors evaluated specific performance attributes including operator performance, communications, and instrumentation accuracy. The inspectors reviewed procedures and/or observed selected activities associated with the Unit 2 refueling outage. The inspectors verified activities were performed in accordance with procedures

and verified required acceptance criteria were met. The inspectors also verified that conditions adverse to quality identified during performance of selected outage activities were identified as required by the licensee's corrective action program. Documents reviewed are listed in the Attachment. The inspectors also evaluated the following activities:

- New fuel receipt and inspection;
- Pre-Outage Shutdown Safety Review;
- Reactor plant shutdown and cooldown, including evaluation of cooldown rates;
- Initial containment and containment sump walkdown, including liner inspection;
- Coordination of electrical bus work, emergency diesel generator tests;
- Monitoring of decay heat removal processes;
- Pressurizer bubble collapse and solid plant operations;
- Refueling activities, fuel handling and inspection;
- Reactor head repairs and inspections;
- Drain of RCS to reactor vessel flange; and
- Verified reloaded core map.

b. Findings

Introduction: A Green, self-revealing NCV of TS 5.4.1, "Procedures", was identified in that technicians inadvertently caused an auxiliary feedwater actuation when the plant was shutdown for refueling. Specifically, the procedure used to inject simulated steam generator water signals was inadequate, which resulted in the technicians erroneously inserting two-of-three (2/3) Low-Low level signals to the SGs and causing actuation of auxiliary feedwater.

Description: On March 7, Unit 2 was in the process of simulating steam generator water levels (SGWLs) when channel 1 and channel 2 SGWLs were placed in 'test', which resulted in the actuation of the auxiliary feed water system. Attachment 10 of procedure 2OM-52.4.R.1.A, Station Shutdown Mode 1 to Mode 6, procedure directs technicians to insert SGWL inputs (simulating a normal water level) to prevent ESF actuation while adjusting real SGWL throughout the outage.

The technicians performing the work failed to apply a voltage to the channel 1 terminals prior to placing the channel 2 steam generator water levels to test. By placing channel 1 and channel 2 in test simultaneously for all three RCS loops, the ESF logic (2/3 SG Low-Low water level) for AFW actuation was met. The A and B motor-driven AFW pumps started, but did not discharge water into the steam generators due to the AFW valves being shut per 2OM-52.4.R.1.A. The turbine drive AFW pump was isolated at the time. The bypass feedwater regulating valves (FRVs) did open, resulting in an increase in SGWL due to a condensate pump operating, but was controlled by the reactor operator taking manual control of the bypass FRVs.

Analysis: The failure to maintain adequate procedures for controlling SGWL indications adequately was a performance deficiency. Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of

NRC requirements. The finding is more than minor because it is similar to example 4.b in IMC 0612, Appendix E.

The inspectors performed a Phase 1 SDP evaluation in accordance with IMC 0609, Appendix G, Attachment 1, Checklist 2 "PWR Cold Shutdown Operation: RCS Closed and SGs Available for DHR (Loops Filled and Inventory in Pressurizer) Time to Boiling Less than 2 Hours." There was no loss of control and all mitigating capabilities were available, therefore a Phase 2 quantitative assessment was not required and the issue screened to Green (very low safety significance).

The cause of this NCV relates to the cross-cutting aspect of Human Performance, Work Control, in that FENOC personnel did not appropriately coordinate work activities by incorporating actions to address the need to communicate, coordinate and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance.[H.3.(b)]

Enforcement: TS 5.4.1, "Procedures", requires that procedures be established, implemented and maintained as recommended in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33, Section 2.j requires general plant operating procedures, including instructions for transitioning from hot standby to cold shutdown. Contrary to the above, FENOC failed to maintain adequate procedures for plant cooldown. Because this deficiency is considered to be of very low safety significance (Green), and was entered into the corrective action program (CR 11-90528), this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. (**NCV 05000412/2011002-1, Inadvertent Auxiliary Feedwater Start during Steam Generator Water Level Instrument Adjustments**).

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (6 samples: 1 containment isolation valve, 1 leak rate, 1 in-service testing and 3 routine)

The inspectors witnessed the performance of or reviewed test data for the following Operation Surveillance Test (OST) and Maintenance Surveillance (MSP) packages. The reviews verified that the equipment or systems were being tested as required by TS, the UFSAR, and procedural requirements. The inspectors also verified that the licensee established proper test conditions, that no equipment pre-conditioning activities occurred, and that acceptance criteria were met.

- On January 7, Unit 2, 2RST-02.05, "Moderator Temperature Coefficient Determination;"
- On January 30, Unit 2, 2OST-6.4, "Measurement of Seal Injection Flow;"
- On March 9, Unit 2, 2OST-11.4, "Accumulator Check Valve Test [2SIS*141, 145, 151];"
- On March 10, Unit 2, 2OST-7.11A, "CHS and SIS Operability Test Train-A;"
- On March 23, Unit 1, 1OST-6.2A, ""Computer Generated Reactor Coolant System Water Inventory Balance;" and
- On March 29, Unit 2, 2OST-45.9B, "Alternate Shutdown Panel Control Checks."

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety [RS]

2RS01 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope (1 Sample)

During the period March 21 - 24, the inspector conducted the following activities to verify that the licensee was evaluating, monitoring, and controlling radiological hazards for work performed during the 2R15 refueling outage and in Unit 1, in locked high radiation areas (LHRA) and other radiological controlled areas. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, Technical Specifications, and the licensee's procedures.

Radiological Hazards Control and Work Coverage

The inspector identified work performed in radiological controlled areas in Unit 1 and Unit 2 and evaluated the licensee's assessment of the radiological hazards. The inspector evaluated the survey maps, exposure control evaluations, electronic dosimeter dose/dose rate alarm set points, and radiation work permits (RWP), associated with these areas, to determine if the exposure controls were acceptable. Specific work activities evaluated included an entry at power into the Unit 1 reactor building containment (RBC) to repair a brake on an in-core drive (RWP-1-11-1028) and a Unit 2 high activity resin flush (RWP 2-11-0607). For these tasks, the inspector attended the pre-job briefings and discussed the job assignments with the workers. The inspector also observed (from the centralized monitoring system), the implementation of exposure controls for inspections/repairs performed under the Unit 2 reactor head (RWP 2-11-5051).

The inspector reviewed the air sample records for samples taken under the Unit 2 reactor head to determine if the samples collected were representative of the breathing air zone and analyzed/recorded in accordance with established procedures. During tours of the Unit 2 RBC, the inspector verified that continuous air monitors were strategically located to assure that potential airborne contamination could be timely identified and that the monitors were located in low background areas.

The inspector toured accessible radiologically controlled areas in the Unit 2 reactor RBC and with the assistance of a radiation protection technician, performed independent radiation surveys of selected areas to confirm the accuracy of survey data, and the adequacy of postings. Radiation protection technicians were questioned regarding their knowledge of plant radiological conditions for selected jobs, and the associated controls.

Additionally the inspector reviewed the RWPs developed for other work performed during 2R15 including scaffolding installation/removal and steam generator tasks. In particular, the inspector reviewed the electronic dosimeter dose/dose rate alarm set

points, stated on the RWP, to determine if the set points were consistent with the survey indications and plant policy.

Instructions to Workers

By attending pre-job briefings, the inspector determined that workers performing radiological significant tasks were properly informed of electronic dosimeter alarm set points, low dose waiting areas, stay times, and work site radiological conditions. By observing work-in- progress, the inspector determined that stay times were appropriately monitored by supervision to assure no procedural limit was exceeded. Jobs observed included various tasks performed under the Unit 2 reactor head, a high activity resin flush, and an entry into the Unit 1 containment to repair an in-core drive.

During tours of the RBC, the inspector determined that locked high radiation areas (LHRA) and a very high radiation area (VHRA) had the appropriate warning signs and were secured. Additionally, the inspector identified that low dose waiting areas were appropriately surveyed, identified, and used by personnel.

The inspector discussed with radiation protection supervision the procedural controls for accessing LHRAs and VHRAs and determined that no changes have been made to reduce the effectiveness and level of worker protection.

Contamination and Radioactive Material Control

During tours of the RBC, the inspector confirmed that contaminated materials were properly bagged, surveyed/ labeled, and segregated from work areas. The inspector observed workers using contamination monitors to determine if various tools/equipment were potentially contaminated and met criteria for releasing the materials from the RCA.

Radiological Hazards Control and Work Coverage

By observing preparations for performing dye penetrant testing of the inner reactor head surfaces, the inspector determined that workers wore the appropriate protective equipment, had dosimetry properly located on their bodies, and were under the positive control of radiation protection personnel. Clear radio communication was established between the workers and the centralized monitoring system. Stay times were properly measured and supervisory personnel controlled the movements of the workers to assure that exposure was minimized.

Radiation Worker Performance

During job performance observations, the inspector determined that workers complied with RWP requirements and were aware of radiological conditions at the work site. Additionally, the inspector determined that radiation protection technicians were aware of RWP controls/limits applied to various tasks and provided positive control of workers to reduce the potential of unplanned exposure and personnel contaminations.

Problem Identification and Resolution

A review of Nuclear Oversight field observation reports, dose/dose rate alarm reports, personnel contamination event reports and associated condition reports, was conducted to determine if identified problems and negative performance trends were entered into the corrective action program and evaluated for resolution and to determine if an observable pattern traceable to a similar cause was evident.

Relevant condition reports (CR), associated with radiation protection control access, initiated between January – March 2011, were reviewed and discussed with the licensee staff to determine if the follow up activities were being conducted in an effective and timely manner, commensurate with their safety significance.

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls

a. Inspection Scope (2 samples)

During the period February 14 – 17

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) in making preparations for the spring refueling outage (2R15).

Implementation of this program was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures.

Radiological Work Planning

The inspector reviewed the preparations being made for performing radiologically significant tasks during the spring 2011 refueling outage (2R15). Included in this review were the ALARA Plans (AP) for all jobs whose dose was estimated to exceed 5 person rem. These jobs included reactor vessel disassembly/re-assembly (AP 11-2-10), steam generator platform/channel head work (AP 11-2-09), scaffolding installation/ removal (AP 11-2-17), reactor head inspections (AP 11-2-21), reactor head NDE/QC inspections (AP 11-2-49), and reactor head weld repair (AP 11-2-50).

In performing this review, the inspector evaluated contamination control measures,use of portable ventilation systems, use of temporary shielding, and the control of system drain-downs. Additionally, the inspector evaluated the departmental interfaces between radiation protection, operations, maintenance crafts, and engineering to identify missing ALARA program elements and potential interface problems. The evaluation was accomplished by reviewing recent ALARA Manager's Committee meeting minutes, Nuclear Oversight Reports, and interviewing the site Radiation Protection Manager, and

the ALARA Supervisor regarding the 2R15 preparations.

During the period March 21 - 24

The inspector conducted the following activities to verify that the licensee was properly implementing operational, engineering, and administrative controls to maintain personnel exposure ALARA for tasks performed during the Unit 2 refueling outage (2R15) and for a Unit 1 RBC entry, during power operations.

Implementation of this program was reviewed against the criteria contained in the 10 CFR 20, applicable industry standards, and the licensee's procedures.

Radiological Work Planning

The inspector reviewed pertinent information regarding site cumulative exposure history, current exposure trends, and the ongoing exposure challenges for the Unit 2 outage. The inspector reviewed the 2R15 Outage ALARA Plan.

The inspector reviewed the exposure status for tasks performed during the Unit 2 outage and compared actual exposure with forecasted estimates contained in various project ALARA Plans (AP). In particular, the inspector evaluated the effectiveness of ALARA controls for all jobs that were estimated to exceed 5 person-rem. These jobs included reactor vessel disassembly/re-assembly (AP 11-2-10), steam generator (S/G) channel head tasks (AP 11-2-09), scaffolding installation/removal (AP 11-2-17), reactor head inspections (AP11-2-49), and reactor head repairs (AP 11-2-50).

The inspector reviewed the Work-In-Progress ALARA reviews for those jobs whose actual dose approached 75 percent of the forecasted estimate.

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 site staff, reviewing outage Work-in-Progress reviews, attending Station ALARA Managers Committee (AMC) meetings, and reviewing recent AMC meeting minutes. The AMC meetings, which the inspector attended, included review of actual exposure for C-reactor coolant pump (RCP) maintenance in Unit 2, replacing the Unit 1 excore detector,and reviewing dose allocation for outage RWPs whose actual dose exceeded 50 percent of stretch goals.

Verification of Dose Estimates

The inspector reviewed the assumptions and basis for the 2R15 outage ALARA forecasted exposure. The inspector also reviewed the revisions made to various outage project dose estimates due to emergent work; e.g. reactor disassembly activities, reactor coolant pump maintenance, and radiation protection support activities, authorized by the ALARA Managers Committee.

The inspector evaluated the implementation of the licensee's procedures associated with monitoring and re-evaluating dose estimates and allocations when the forecasted cumulative exposure for tasks was approached. Included in the review were

Work-In-Progress reports that evaluated the effectiveness of ALARA measures and addressed shortcomings in original dose estimates.

Additionally, the inspector reviewed the exposures for the ten (10) workers receiving the highest doses for 2011 to confirm that no individual exceeded the regulatory limits or performance indicator thresholds.

Source Term Reduction and Control

The inspector reviewed the status and historical trends for the Unit 2 source term. Through review of survey maps and interviews with the Senior Nuclear Specialist - ALARA, the inspector evaluated recent source term measurements and control strategies. Specific strategies being employed included use of macro-porous clean up resin, increased filtration flow, enhanced chemistry controls, system flushes, and temporary shielding.

The inspector reviewed the effectiveness of temporary shielding by reviewing pre/ post-installation radiation surveys for selected components having elevated dose rates. Shielding packages reviewed included those placed on the reactor head, pressurizer spray piping, steam generator penetrations, fuel transfer keyway, and RCP piping.

Job Site Inspections

The inspector reviewed the ALARA controls specified in ALARA Plans and RWPs, for reactor head repairs, high activity resin transfers, steam generator maintenance, performed during 2R15, and for a Unit 1 RBC entry to replace a brake on an in-core drive system.

During tours of the RBC, the inspector observed workers performing steam generator demobilization from eddy current testing, RCP maintenance, and reactor head inspections. Workers were questioned regarding their knowledge of job site radiological conditions and ALARA measures applied to their tasks.

Problem Identification and Resolution

The inspector reviewed elements of the licensee's corrective action program related to implementing the ALARA program to determine if problems were being entered into the program for timely resolution, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions. Specifically, condition reports related to programmatic dose challenges, personnel contaminations, dose/dose rate alarms, and the effectiveness in predicting and controlling worker exposure were reviewed.

b. Findings

No findings were identified.

2RS03 Occupational Dose Assessment

a. Inspection Scope (2 samples)

During the period February 14 – 17

The inspector conducted the following activities to verify that in-plant airborne concentrations of radioactive materials are being controlled and monitored, and to verify that respiratory protection devices area properly maintained and used by qualified personnel.

Implementation of these programs was evaluated against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures.

Engineering Controls

The inspector verified that the licensee uses installed ventilation systems as part of its engineering controls (in lieu of respiratory protection devices) to control airborne radioactivity. The inspector reviewed procedural guidance for use of an installed system, the Control Room Emergency Ventilation System (CREVS) and determined that the system was operable. The inspector reviewed surveillance testing procedures and related data to confirm that the CREVS airflow capacity, flow path, and charcoal/HEPA filter efficiencies met regulatory criteria and are consistent with maintaining concentrations of airborne radioactivity as low as practicable. Also reviewed were the radiation detector calibration records for installed monitors and testing records that the system realigned at the appropriate radiation level. The inspector verified the system configuration by walking down components with the plant system engineer.

The inspector evaluated the use of in-plant continuous air monitor system (AMS-4) to determine if the monitors were appropriately located in areas where airborne radioactivity could potentially result from normal plant operations and that the systems were operable. With the assistance of a senior radiation technician the inspector observed weekly source checks of monitors located in the Unit 1 safeguards building and the Unit 2 spent fuel storage building, and determined that the instruments were operable. The inspector reviewed the calibration records for AMS-4 monitors located in other plant areas to determine if the instruments had their alarm set points appropriately established.

Through review of relevant procedures and analytical data, the inspector determined that the licensee has established an alpha and transuranic radiation monitoring program. Included in this program were action levels for conducting additional measurements to assure that the airborne concentrations were properly characterized and that bioassay measurements would be taken, should the monitoring threshold be reached.

Use of Respiratory Protection Devices

The inspector observed the respirator fit testing of one (1) individual to determine if the testing was appropriately conducted per the procedural guidance. Additionally, the inspector confirmed that the individual tested had completed the requisite training and was medically qualified to wear a respirator.

The inspector examined various negative pressure, self-contained and supplied air respiratory protection devices and determined that these devices were certified for use by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA).

The inspector reviewed the records of air testing for supplied service air devices and self-contained breathing apparatus (SCBA). The air used in these devices appropriately exceeded the quality requirements for Grade D quality.

Self-Contained Breathing Apparatus for Emergency Use

The inspector evaluated the adequacy of the respiratory protection program regarding the maintenance and issuance of SCBA to emergency response personnel. Training and qualification records were reviewed for at least three (3) licensed operators from each of the operating shifts, and for selected radiation protection personnel who would wear SCBAs in the event of an emergency.

The inspector observed a technician perform functional inspections on four (4) SCBAs staged at the Unit 1 Radiological Controlled Area (RCA) access point. Maintenance, hydrostatic test records, and regulator flow test records for these SCBAs were reviewed. The method of refilling SCBA cylinders was evaluated and the air sample results were reviewed to confirm that the air quality met CGA G-7.1, Grade D (2004) standards.

Through review of training lesson plans and interviews, the inspector confirmed that individuals qualified to wear SCBAs were trained in replacing spent air cylinders.

Problem Identification and Resolution

Through review of Condition Reports and Nuclear Oversight field observations and an audit, the inspector verified that problems associated with the control and mitigation of in-plant airborne radioactivity are being identified at an appropriate threshold and are properly addressed for resolution in the corrective action program.

During the period March 21 – 24

The inspector conducted the following activities to verify that in-plant airborne concentrations of radioactive materials are being controlled and monitored, and to verify that respiratory protection devices are properly selected and used by qualified personnel.

Implementation of these programs was evaluated against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures.

Engineering Controls

The inspector evaluated the use of portable continuous air monitors (AMS-4) and portable HEPA ventilation systems that were used during the 2R15 outage. The inspector determined that the monitors were located at work locations in the RBC where airborne contamination could potentially occur. The inspector reviewed testing records for portable HEPA ventilation systems to determine that procedural performance criteria were met.

Respiratory Protection

The inspector reviewed the use of respiratory protection devices worn by workers. The inspector reviewed air sampling records, RWPs, and TEDE ALARA DAC evaluations to determine if the use of respiratory protection devices was commensurate with the potential external dose that may be received when wearing these devices.

Problem Identification and Resolution

The inspector reviewed elements of the licensee's corrective action program related to implementing the airborne monitoring program to determine if problems were being entered into the program for timely resolution, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions. Specifically, condition reports related to monitoring challenges, personnel contaminations, dose assessments, and the reliability of monitoring equipment were reviewed.

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment

a. Inspection Scope (1 sample)

During the period March 21 - 24, the inspector conducted the following activities to verify that the accuracy and operability of personal monitoring equipment and the effectiveness of determining a worker's total effective dose equivalent.

Implementation of these programs was evaluated against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures.

External Dosimetry

The inspector verified that the licensee's dosimetry processing was accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). The inspector verified that the approved dosimeter irradiation categories were consistent with the types and energies of the site's source term.

The inspector confirmed that the licensee has developed "correction factors" to address the response of electronic dosimeters as compared to thermoluminescent dosimeters.

Internal Dosimetry

The inspector evaluated the equipment and methods used to assess worker dose resulting from the uptake of radioactive materials. Included in this review were bioassay procedures, whole body counting equipment (FastScan, AccuScan, portal contamination monitors) calibration and operating procedures, and the analytical results for 10 Part 61 samples.

The inspector determined that the procedural methods include techniques to distinguish internally deposited radioisotopes from external contamination, methods to assess dose from hard-to-measure radioisotopes, and methods to distinguish ingestion pathways from inhalation pathways.

The inspector reviewed the results from three whole body counts to assess the adequacy of the counting time, background radiation contribution, and the nuclide library used for assessing deposition. No individual exposure exceeded a committed effective dose equivalent (CEDE) of 10 mrem.

Special Dosimetric Situations:

Declared Pregnant Workers

The inspector reviewed the procedural controls, and associated records, for managing declared pregnant workers (DPW) and determined that one DPW was employed during the Unit 2 outage. The inspector reviewed the individual exposure results and monitoring controls to assure compliance with 10 CFR 20.

Effective Dose Equivalent Methods

The inspector reviewed the licensee's procedures for monitoring external dose where significant dose gradients exist at the work site. For 2R15, external effective dose equivalent methods were used in assessing personnel exposure for work performed under the reactor head. The inspector observed the preparations made for performing dye penetrant examinations of the reactor head surface. These preparations included worker briefings, placement of dosimetry on the workers head, thorax, and abdomen, coordination of worker's movements from the centralized monitoring system, and remotely monitoring worker dose using telemetry. Upon completing the work, the inspector confirmed that the dosimetry was appropriately handled and transferred to the dosimetry laboratory for processing.

Problem Identification and Resolution

The inspector reviewed elements of the licensee's corrective action program related to implementing the dosimetry program to determine if problems were being entered into the program for timely resolution, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions. Specifically, condition reports related to dose assessments, personnel contaminations, and dose/dose rate alarms were reviewed.

B. Findings

No findings were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope (6 samples)

The inspectors sampled licensee submittals for Performance Indicators (PI) listed below for both Unit 1 and Unit 2 to verify accuracy of the data recorded from January 2010 through December 2010. The inspectors reviewed Licensee Event Reports, condition reports, portions of various plant operating logs and reports, and PI data developed from monthly operating reports. Methods for compiling and reporting the PIs were discussed with cognizant engineering and licensing personnel. To verify the accuracy of the PI data reported during this period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 6, were used for each data element.

.1 Cornerstone: Initiating Events

- Unit 1 and Unit 2 Unplanned Scrams per 7000 Critical Hours [IE01];
- Unit 1 and Unit 2 Unplanned Transients per 7000 Critical Hours [IE03]; and
- Unit 1 and Unit 2 Unplanned Scrams with Complications [IE04].

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 1 trend sample)

.1 Daily Review of Problem Identification and Resolution

a Inspection Scope

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

b. Findings

Introduction: A Green, self-revealing non-cited violation (NCV) of TS 5.4.1, "Procedures", was identified in that the chemistry procedures failed to provide adequate detail to ensure timely completion of TS required sampling of the spray additive system. Specifically, FENOC failed to complete timely sampling and analysis of the chemical addition tank, resulting in reasonable doubt of the operability of the spray additive system for 13 days.

Description: On December 9, 2010, the Unit 1 chemical addition tank for the spray additive system was sampled per WO 200396970. A hydrometer analysis was

performed on this sample the afternoon of December 9, with a result of 20.26% weight sodium hydroxide (NaOH). Normally, the hydrometer result is averaged with the titration result to give the final determination of NaOH weight in solution. The required titration was not completed during this timeframe to allow documentation of the average result. This averaged result must be within the required TS range is 19.5-20% weight NaOH. In this case, Procedure 1-CHM-SAM-3.19, Chemical Addition Tank, documented the required TS range, but did not provide a timeframe for analysis completion, despite the need to support TS 3.6.8 for spray additive system operability. The chemist noted the hydrometer analysis result of 20.26% weight NaOH in the work order binder, but did not inform a supervisor of the results of the hydrometer analysis.

On December 20, WO 200396970 was recognized as not being complete by a chemistry supervisor, and the task was added to the work week. The second part of the analysis, a titration, was completed on December 22, 13 days after the hydrometer analysis. The result of the titration was 19.99% weight NaOH, which was averaged with the hydrometer analysis from December 9, gave a final result of 20.13% weight NaOH, which exceeded the TS sample range.

The analysis results were reviewed by a supervisor, who notified the control room of the out of specification condition. The chemical addition tank was declared inoperable, which resulted in an entry into TS LCO 3.6.8 for the Unit 1 Spray Additive System. The control room verified no change in tank level had occurred since December 9 and resampled the chemical addition tank. Two samples were analyzed with final averaged results of 19.80% and 19.84% weight NaOH. The Unit 1 Spray Additive System was then declared operable and the TS LCO 3.6.8 was exited on December 9.

Analysis: The failure to maintain adequate chemistry procedures to perform TS required sampling of the spray additive system was a performance deficiency. Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of NRC requirements. The finding is more than minor because it is similar to example 3.j in IMC 0612, Appendix E and it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affects the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

In accordance with IMC 0609.04 (Table 4a), Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the finding was not a design or qualification deficiency which resulted in a loss of safety function.

The cause of this NCV relates to the cross-cutting aspect of Problem Identification and Resolution, Corrective Action Program, in that FENOC personnel did not implement a corrective action program with a low threshold for identifying issues. FENOC did not identify the issue completely, accurately and in a timely manner commensurate with its safety significance.[P.1(a)]

Enforcement: TS 5.4.1, "Procedures", requires that procedures be established, implemented, and maintained as recommended in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33, Section 8.b requires procedures for surveillance tests for

containment heat and radioactivity removal systems. Contrary to the above, FENOC failed to maintain adequate chemistry procedures for TS required sampling of the spray additive system. Because this deficiency is considered to be of very low safety significance (Green), and was entered into the corrective action program (CR 10-87438), this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000334/2011002-1, Inadequate Spray Additive System Sampling Procedures)**

.2 Semi-Annual Trend Review (71152)

a. Inspection Scope (1 sample)

The inspectors reviewed site trending results for the time period July through December 2010, to determine if trending was appropriately performed and evaluated by FENOC. This review covered the site trending program under FENOC's Integrated Performance Assessment process, and included a sample of self-assessments from the several organizations at Beaver Valley. This review verifies that existing trends were (1) appropriately captured and scoped by applicable departments, (2) consistent with the inspectors' assessment from the daily CR and inspection module reviews and (3) not indicative of a more significant safety concern. Additionally, the inspectors verified the performance of site trending against NOP-LP-2001, "Condition Report Process", and NOBP-LP-2018, "Integrated Performance Assessment /Trending." The inspectors also reviewed quarterly Quality Assurance reports and issues captured in the Activity Tracking database to identify issues and trends to evaluate during the inspection.

b. Findings and Observations

No findings of were identified. However, two trends were noted by the inspectors and FENOC that involved completing preventive maintenance late, as documented in condition reports (CR 11-88466, 10-85221, 10-85278) and inadequacies in procedure content / quality (11-91354, 10-82360). These involved both safety and non-safety systems, but did not result in any failed surveillance tests.

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

The inspectors performed event followup inspections activities documented below. Documents reviewed for this inspection activity are listed in the Supplemental Information attached to this report.

.1 Plant Event Review

a. Inspection Scope (3 samples)

For the plant events below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to regional personnel and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of additional reactive inspection activities. The inspectors reviewed FENOC's follow-up actions related to the events to assure that appropriate

corrective actions were implemented commensurate with their safety significance. Documents reviewed during the inspection are listed in the Attachment.

- Unit 2: On March 7, 2011, during steam generator water level simulation to support shutdown conditions, the technicians erroneously inserted signals satisfying Lo-Lo SGWL logic criteria, causing an inadvertent actuation of the motor-driven AFW system. Operators took actions to stop flow to the SGs. Mitigating systems performed as expected. The licensee documented this issue in CR 11-90528 (see section 1R20 finding);

- Unit 2: On March 15, 2011, 'A' standby service water pump (2SWE-21A) auto started when the secondary process rack 'A' was removed from service. Removal of the process rack resulted in a low service water pressure signal due to 2SWS-PT113A failing low, causing the pump 'A' standby service water pump to auto start. Operators responded appropriately and mitigating systems performed as designed. The licensee documented this issue in CR 11-91077; and

- Unit 2: On March 25, 2011, the 2-1 EDG was declared inoperable while the 2-2 EDG was in a planned maintenance outage during the Unit 2 refueling outage. The recently replaced fuel supply lines were indentified to be leaking and incapable of maintaining operability of the 2-1 EDG, resulting in a 50.72 notification (EN#46700).

b. Findings

No additional findings identified

.2 Review of Licensee Event Reports (LERs) (1 sample)

(Closed) LER 05000334 / 2010-002-01: "270 Degree Circumferential Flaw Found on Residual Heat Removal System Drain Valve Socket Weld."

The update to the LER was to document the validation of the probable cause of the crack on 1RH-200, which was confirmed to be fatigue. This issue was granted enforcement discretion and LER closed in report 05-334/2010005, dated February 14, 2011. The information reviewed in this update does not invalidate any previous conclusion. The inspector determined that no findings of significance were identified and no violations of NRC requirements occurred. This LER is closed.

4OA5 Other

.1 RCS Dissimilar Metal Butt Welds (DMBW)

a. Inspection Scope

The inspector reviewed visual examination records of three hot leg and one cold leg dissimilar metal butt welds (DMBWs) nozzle-to-safe-ends performed during 2R15 to verify that FENOC had incorporated and implemented MRP-139 industry guidelines regarding nondestructive examination and evaluation of certain dissimilar metal butt welds (DMBW) in reactor coolant systems containing nickel based Alloys 600/82/182.

b. Findings

No findings were identified.

.2 Review of License Renewal Commitment Inspection of Unit 2 Containment Liner

a. Inspection Scope

Beaver Valley Unit 2 containment liner was visually and UT inspected during 2R15. Visual examination of 100% of accessible containment liner surfaces and UT thickness liner volumetric examinations of 61 random and 8 non-random sample locations were scheduled. Sections of the containment liner were volumetrically examined by ultrasonic testing (UT) and assessed by FENOC personnel to be satisfactory and met design nominal liner thickness. During this onsite in-service inspection period, FENOC accomplished 8 of 8 non-random sample locations and 49 of 61 random sample locations satisfactorily. One random location 2RN063 exceeded the statistical acceptance criterion established as 90 percent (less than 10 percent degradation) of the nominal wall thickness, but met design thickness minimum, the remaining 12 random sample locations are scheduled to be completed during the 2R15 outage.

The inspector conducted an inspection of the Unit 2 containment liner coatings, directly observed a sample of manual and automated UT thickness examinations and reviewed several random and non-random UT examination test result records of Unit 2 containment liner inspections to verify that the inspections were performed in accordance with ASME Code, Section XI, Subsection IWE and met Beaver Valley Unit 2 operating license.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Inservice Inspection
The inspector presented the inspection results to Mr. Mark Manoleras, Engineering Director and other members of the FirstEnergy staff at an exit meeting conducted on March 23, 2011. FirstEnergy acknowledged the inspection results and observations presented. No proprietary information is presented in this report.

.2 Access Control / ALARA Planning and Control
The inspector presented the inspection results of 2RS01 and 2RS02 to Mr. Paul Harden, Site Vice President, and other members of FENOC staff, at the conclusion of the inspection on February 17. No proprietary information is presented in this report.

.3 Radiation Monitoring Instrumentation and Protective Equipment
The inspector presented the inspection results of 2RS03 to Mr. Ray Lieb, Director of Site Operations, and other members of FENOC staff, at the conclusion of the inspection on March 24. No proprietary information is presented in this report.

.4 Quarterly Inspection Report Exit

On May 4, the inspectors presented the normal baseline inspection results to Mr. Paul Harden, Site Vice President, and other members of the licensee staff. The inspectors confirmed that proprietary information was not retained at the conclusion of the inspection period.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

S. Baker	Radiation Protection Manager
R. Brosi	Director, Performance Improvement
A. Burger	Supervisor, Reactor Engineering
D. Canan	Radiation Protection Specialist, Respiratory Protection
J. Fontaine	Radiation Protection ALARA Supervisor
D. Grabski	ISI Coordinator
P. Harden	Site Vice President
T. Heimel	NDE Level III
M. Helms	Fleet Nuclear Oversight
S. Kubis	System Engineer
R. Kurkiewicz	Nuclear Oversight Manager
J. Lebda	Supervisor, Dosimetry
R. Lieb	Director, Site Operations
J. Marsh	Technical Specification Engineer
J. Mauck	Regulatory Compliance Engineer
T. McGourty	Plant Engineer, Ventilation Systems
B. Murtaugh	Design Engineer
D. Patten	Fleet Engineering Programs
J. Saunders	Radiation Protection Supervisor, Radwaste
B. Sepelak	Supervisor, Regulatory Compliance
W. Williams	Alloy 600 Program Owner

Other Personnel

M. Rubadue	Inspector, State of Ohio
L. Ryan	Inspector, Pennsylvania Department of Radiation Protection

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Open/Closed

05000412/2011002-1	NCV	Inadvertent Auxiliary Feedwater Start during Steam Generator Water Level Instrument Adjustments (Section 1R20)
05000334/2011002-1	NCV	Inadequate Spray Additive System Sampling Procedures (Section 4OA2.1)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
1/2OM-53C.4A.75.2, Acts of Nature – Flood, Rev.
1/2OM-53C.4A.75.1, Acts of Nature – Tornado or High Winds, Rev.

Conditions Reports
10-73582 10-74459 10-72954 10-85434 10-85978 11-91585 11-91633

Section 1R04: Equipment Alignment

Procedures
2OM-36.3.B.3, Valve List-2EGF, Rev. 10
2-CHM-ADD-7.50, Recirculating Spray Heat Exchanger Chemical Cleaning, Rev. 0
2OM-30.3.B.1,Valve List 2SWS, Rev. 39
1OM-44A.3.B.1, Valve List 1VS, Rev. 20

Drawings
10080-RM-0436-001, VOND Diesel Fuel Oil, Rev. 6
10080-RM-0430-001

Condition Reports
11-91749 11-90504 10-78044 09-67473

Section 1R05: Fire Protection

Pre-Fire Plans
2PFP-RCBX-767 2PFP-RCBX-738 2PFP-RCBX-718 2PFP-RCBX-692
2PFP-SRVB-730

Other
CR 11-91311
CR 10-74749
Analysis No. 10080-B-085, Rev. 14, p. 40-41
Analysis No. 10080-B-085, Rev. 14, p. 42-43

Section 1R06: Flood Protection

Procedures
NORM-ER-3112, Rev. 1, Cable Monitoring

Condition Reports
09-60496 10-80688 10-86647 10-87030 10-87161

Section 1R08: Inservice Inspection

Examination Procedures

NDE-VT-513, Visual Examination of the Reactor Vessel Bottom Mounted Instrumentation (BMI) Nozzles, Rev. 3

NDE-UT-308, Component Weld Profiling and Thickness Measurements Using Straight Beam Ultrasonic Techniques, Rev.14

NDE-VT-510, Visual Inspection for Boric Acid Leakage, Rev.16

NDE Records

Visual Examination Report, VT-11-1046, Reactor Vessel Lower Head BMI Nozzles, dated 03/22/2011

UT Vessel Examination Report, UT-11-1065, 2RCS*SG21B-C-03, Shell Circumferential Weld #3, dated 03/22/2011

Visual Exam for Leakage (VT-2) Report, VT-11-1025, 2RCS*REV21-N-23, Nozzle-to-Safe-End Weld, dated 03/11/2011

Visual Exam for Leakage (VT-2) Report, VT-11-1026, 2RCS*REV21-N-24, Nozzle-to-Safe-End Weld, dated 03/11/2011

Visual Exam for Leakage (VT-2) Report, VT-11-1027, 2RCS*REV21-N-26, Nozzle-to-Safe-End Weld, dated 03/11/2011

Visual Exam for Leakage (VT-2) Report, VT-11-1025, 2RCS*REV21-N-28, Nozzle-to-Safe-End Weld, dated 03/11/2011

UT Erosion/Corrosion Examination Report, BOP-UT-11-083, 2RN-40, Autoscan Unit 2 Containment Liner, dated 03/22/2011

Liquid Penetrant Examination Report, PT-11-1002, Integral Attachment Lug, 2RCS*PRE21-WL-1, dated 03/17/2011

WestDyne Surface Examination Data Report, WDI-PJF-1304795 RPT-001, Unit 2 Under Head Penetration Overlay Welds, dated 3/22/2011

WestDyne Reactor Vessel Head Penetration Inspection Final Report WDI-PJF-1304795-FSR-001, Beaver Valley Unit 2, 2R15, dated March, 2011.

Miscellaneous

ASME Boiler and Pressure Vessel Code Case N-729-1, Alternative Examination Requirements for PWR Reactor Vessel Upper Heads

BVBP-ENG-0109, BVPS Containment Liner UT Thickness Guidance Document, Rev. 0

SG-SGMP-11-4, Beaver Valley Power Station 2R15 Steam Generator Degradation Assessment, March 2011

SG-SGMP-10-5, Beaver Valley Unit 2 Cycle 15 Steam Generator Operational Assessment, February 23, 2010

ISIE-ECP-2, Steam Generator Examination Program, Rev. 23

ISIE1-8, Unit 2 Steam Generator Examination Guidelines, Rev.12

1/2-ADM-2039, BVPS ISI Ten-Year Plans, Rev.11

1/2-ADM-2096, BVPS Alloy 600/690 Management Program, Rev.10

NOP-CC-5703, FirstEnergy Nuclear Operating Company (FENOC) ASME Section XI Repair/Replacement (R/R) Program, Rev. 00

MS-C-10-06-13, Fleet Oversight Audit Report, June 30, 2010 through August 12, 2010, Engineering ASME (EEN-007), 8/13/2010

SN-SA-10-258, FENOC ASME Section XI Inservice Examination Program Self Assessment, 9/28/2010

ECP No. 10-0392-001, BV2 Reactor Vessel Head Penetration Nozzle Repair, Rev. 0

Condition Reports

09-66489	09-66557	09-66685	09-67338	11-90519	11-90555
11-90870	11-90997	11-91022	11-91079	11-91086	11-91146
11-91213	11-91331	11-91350			

Section 1R11: Licensed Operator Requalification Program

Other
OTLC-JITSHDN2R15_BV2, Rev. 0, "Shutdown for Refueling, Mode 5 Operations, System Malfunctions"
OTLC-JITSTUP2R15_BV2, Rev. 0, "2R15 Just In Time Startup Training with System Malfunctions"

Condition Reports
11-89375

Section 1R12: Maintenance Rule Implementation

Other
NOBP-LP-4012, Rev. 3, NRC Performance Indicators

Condition Reports

07-31282	10-87078	11-88460	11-88180

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

Procedures
1/2OM-53C.4A75.1, Acts of Nature-Tornado or High Wind Condition, Rev. 12
2OM-36.4.AL, Preparing EDG 2-2 Sequencer for Functional Testing, Rev. 2
2OST-1.11B, Safeguards Protection System Train A SIS Go Test, Rev. 39

Condition Reports

11-89300	11-90721	11-91758	11-91738

Work Orders
20045536

Other
BVPS Unit 2 Operator Logs, March 25-27
Defense-in-Depth Contingency Plan #2R15-010, regarding EDG 2-2 T/S, dated 3/8/11
Shutdown Defense-in-Depth – March 25-27

Section 1R15: Operability Evaluations

Procedures
1OST-2.4A, Quadrant Power Tilt Ratio Manual Calculation, Rev. 4
NOP-OP-1099, Operability Determinations and Functionality Assessments

Condition Reports
11-88199 11-88499 11-89276 11-89270 11-90096 11-90824

Section 1R18: Plant Modifications

Condition Reports
11-90414 11-90359 11-90240 11-90238 11-90116 11-90036
10-89270 09-58774 09-58775

Regulatory Applicability Determination and 10 CFR 50.59 Screens
11-0165 11-01065 10-03157

Procedures
2OM-36.4.4Q, Rev. 4, 4kV Station Service System Operating Procedures

Other
ECP 10-0590, Reference documents for ECP 10-0590 - BV2 Spent Fuel Pool Cask Pit Rack Installation, Rev.1
ECP 11-0148, Reference documents for ECP 11-0148 – Replacement for Obsolete ATC Co Model 365A Tming Relay BV-762-EGSBA, Rev. 1
EER 200436950, for ECP 10-0590

Section 1R19: Post-Maintenance Testing

Procedures
1BVT-1.44.2, Control Room Emergency Habitability System Flow and Filtration Efficiency Test, Rev. 12
1MSP-24.29-I, F-1FW-486 Loop 2 Feedwater Flow Channel IV Calibration, Rev. 24
2OST-7.11A, CHS and SIS Operability Test – Train A, Rev. 18

Work Orders
200402892 200451265 200400086 200400196 200447414

Condition Reports
06-03667 08-35221 08-38151 08-49914 09-52488 11-88575
11-88939 11-90760 07-15055 11-90570

Other
BV1 Shift Operating Logs, dated 1/28 – 1/29, 2011

Section 1R20: Refueling and Outage Activities

Procedures
2OM-6.4.I, Draining the RCS for Refueling
2OM-7.4.H, Collapsing the Pressurizer Bubble
2MSP-13-RS SUMP-1M, Containment Sump (2DAS-TK204) Inspection
2OM-47.4.B, Personnel Air Lock Operations
2OM-49.4.H, Movement of Spent Fuel Pool Crane Checklist
2OST-49.3, Refueling Operations Prerequisites

2OST-49.2, Shutdown Margin Calculation
2OM-52.4.R.2.F, Refueling Station Shutdown-Mode 5 Activities

Condition Reports

11-92526	11-91277	11-90904
11-92217	11-91269	11-90592
11-91997	11-91256	11-89987
11-91957	11-91229	11-88997
11-91789	11-91137	
11-91658	11-90989	

Section 1R22: Surveillance Testing

Condition Reports

11-91014	11-90760	10-77917
11-90924	11-90760	09-62807
11-90874	11-90482	09-62754
11-90804	11-88733	07-15055

Work Orders
200451265

Sections 2RS01/2RS02: Radiological Hazard Assessment/Occupational ALARA Planning and Controls

Procedures
1/2-ADM-1601, Radiation Protection Standards
1/2-ADM-1611, Radiation Protection Administrative Guide
1/2-HPP-3.01.001, Radioactive Source Accountability
1/2-HPP-3.05.001, Exposure Authorization
1/2-HPP-3.07.002, Radiation Survey Methods
1/2-HPP-3.07.013, Barrier Checks
1/2-HPP-3.08.003, Radiation Barrier Key Control
1/2-HPP-3.08.006, Shielding
BVBP-RP-0013, Radiation Protection Risk Assessment Process
BVBP-RP-0020, RP Job Coverage General Guidance
NOP-OP4005, ALARA Program
NOP-OP-4005, Operational ALARA Program
NOP-OP-4107, Radiation Work Permit
NOP-WM-7017, Contamination Control Program
NOP-OP-4101, Access Controls for Radiological Controlled Areas
NOP-OP-4102, Radiological Postings, Labeling, and Markings

2R15 ALARA Plans (AP):
AP 11-2-10, reactor vessel disassembly/re-assembly
AP 11-2-09, steam generator (S/G) platform/channel head work
AP 11-2-17, scaffolding installation/removal
AP 11-2-50, reactor head weld repair

AP 11-2-49, reactor head NDE/QC inspections
AP 11-2-21, reactor head inspections

Miscellaneous Documents:
Annual Review of the 2010 10 CFR Part 61 Radionuclide Analysis

Section 2RS03: In-Plant Airborne Radioactivity Control and Mitigation

Procedures:
NOP-OP-4702, Rev 01, Air Sampling
NOP-OP-4107, Rev 5, Radiation Work Permit
NOP-OP-4310, Rev 5, Firehawk M7 Self Contained Breathing Apparatus
NOP-OP-4206, Rev 0, Bioassay Program
NOP-OP-4703, Rev 0, Determination of Alpha Monitoring Levels
NOP-OP-4301, Rev 1, Respiratory Protection Program
NOP-OP-4702, Air Sampling
NOP-OP-4206, Bioassay Program
NOP-OP-4703, Determination of Alpha Monitoring Levels
NOP-OP-4301, Respiratory Protection Program
1/2-HPP-4.06.012, Eberline AMS-4 Continuous Air Monitor
1/2- HPP-3.09.009, Portable High Efficiency Particulate Filter Systems
1/2- HPP-7.03.001, HEPA Vacuum Cleaners & Portable HEPA Filter Unit Monitor Test
1/2-HPP-7.03.002, Airborne Exposure (DAC-Hr) Tracking
1/2-HPP-3.10.020, Rev 8, PortaCount Plus Quantitative Respirator Fit Test System Operation
1/2-HPP-3.10.022, Rev 8, Emergency SCBA Monthly Surveillance
1/2-HPP-3.10.005, Rev 4, Air Supplied Hood
1/2-HPP-4.06.012, Rev 8, Eberline AMS-4 Continuous Air Monitor
1/2-ADM-2035, Rev 5, Control Room Pressure Boundary Control
1/2-HPP-3.09.009, Rev 5, Portable High Efficiency Particulate Filter Systems
1/2- HPP-7.03.001, Rev 1, HEPA Vacuum Cleaners & Portable HEPA Filter Unit Monitor Test

Condition Reports:

10-71596	10-76426	10-86221	10-85430	11-88913	11-89221
10-69662	10-71577	10-72925	10-73002	10-74382	10-84412
10-72047	10-76426				

Nuclear Oversight Field Observation Reports/Audits:
MS-C-09-10-03, Fleet Oversight Audit Report, Radiation Protection/Radwaste
BV320103933, Assessment of the Beaver Valley Respiratory Protection Program
BV120103931 BV220083553 BV320103992

Calibration Records Reviewed:
AMS-4: Serial Nos. 361, 384, 355, 367, 363, 1457, 1832

SCBA Packs Inspected (Regulator No. /Cylinder No.)
LAB078850/ON77477 LAB078925/ON75635 LAB078836/ON78966
LAA239056/ON77488

SCBA Personnel Qualification Reports:
Operations Department
Radiation Protection Department

Surveillance Tests:
1/2OST-43.17A, Control Room Area Monitor (RM-1RM-218A) Test
1/2OST-43.17B, Control Room Area Monitor (RM-1RM-218B) Test
1/2OST-43.17C, Control Room Area Monitor (2RMC*RQ201) Test
1/2OST-43.17D, Control Room Area Monitor (2RMC*RQ202) Test
2MSP-43.29I, Control Room Airborne Radiation Monitor (2RMC-RQI301) Calibration
2MSP-43.43I, Control Room Area Radiation Monitor (2RMC-DAU201) Calibration
2MSP-43.73I, Control Room Area Radiation Monitor (2RMC-DAU202) Calibration
1MSP-43.75I, Control Room Area Radiation Monitor (RM-1RM-218A) Calibration
1MSP-43.76I, Control Room Area Radiation Monitor (RM-1RM-218B) Calibration
1BVT-1.44.2, U-1 Control Room Emergency Habitability System Flow/Filter Efficiency Test
3BVT-1.44.2, U-2 Train A Control Room Emergency Air Cleanup and Pressurization System Flow and Filter Efficiency Test
3BVY-1.44.3, U-2 Train B Control Room Emergency Air Cleanup and Pressurization System Flow and Filter Efficiency Test
1OST-44A.2, U-1 Control Room Emergency Ventilation System Test – Train A
1OST-44A.3, U-1 Control Room Emergency Ventilation System Test – Train B
2OST-44A.2, U-2 Control Room Emergency Ventilation System Test – Train A
2OST-44A.3, U-2 Control Room Emergency Ventilation System Test – Train B

Section 2RS04: Occupational Dose Assessment

Occupational Dose Assessment (71124.04):
BVBP-RP-003, Dosimetry Practices
NOP-OP-4206, Bioassay Administration
NOP-OP-4201, Routine External Exposure Monitoring
NOP-OP-4202, Declared Pregnant Workers
NOP-OP-4204, Special External Exposure Monitoring
NOP-OP-4205, Dose Assessment
1/2-HPP-6.02.002, FastScan Calibration & Routine Operations
1/2-HPP-6.02.004, AccuScan Calibration & Routine Operations
1/2-HPP-6.03.018, MGP-iDC-HF Calibrator Calibrations & Use

Condition Reports:

11-91478	11-91388	11-90549	11-91226	11-91159	11-91518
11-91431	11-91352	11-90871	11-91339	11-91310	11-89689
11-90053	11-90068	11-90599	11-90749	11-90672	11-90889
11-90864					

Nuclear Oversight Field Observation Report Summary:
PA Nos. 1445, 1512, 1432, 1510, 1605, 1606, 1624, 1454, 1476, 1577, 1646, 1655, 1354, 1356, 1389, 1397, 1433, 1436, 1484, 1494, 1503, 1518, 1537, 1549, 1559, 1574

ALARA Managers Committee Meeting Minutes:
Meeting Nos. 2R15-06m, 2R15-05m, 2R15-01m
Temporary Shielding Packages:
No. 11-01, Reactor Head
No. 11-03, Pressurizer Spray Horizontal Piping
No. 11-04, Pressurizer Spray Veritical Piping
No. 11-05, A –S/G Hand Holes
No. 11-19, A-S/G RCS Loop
No. 11-39, Keyway Hatch
No. 11-42, Reactor Head Stand

Miscellaneous Documents:
NVLAP Certification Records, Personnel Dosimetry Performance Testing
Annual Review Report of the 2010 10 CFR Part 61 Radionuclide Analysis
Electronic Dosimeter Dose/Dose Rate Alarm Reports, January – March 2011
Beaver Valley Power Station 2R15 Outage ALARA Plan
Top Ten Individual Exposure Records for 2011
Portable HEPA Inventory & Test Records
EPRI Standard Radiation Monitoring Program Data Summary for Unit 2 piping
Unit 2 Reactor Coolant System 2R15 Clean Up Data

2R15 ALARA Plans / Work-In-Progress Reviews:
AP-1-11-01, Unit 1 incore detector troubleshoot and repair
AP 11-2-10, reactor vessel disassembly/re-assembly
AP-11-2-07, secondary side steam generator (S/G) sludge lancing/inspection/FOSAR
AP 11-2-08, primary side S/G equipment set up/demob
AP 11-2-09, steam generator platform/channel head work
AP 11-2-17, scaffolding installation/removal
AP 11-2-50, reactor head weld repair
AP 11-2-49, reactor head NDE/QC inspections
AP 11-2-21, reactor head inspections
AP 11-2-51, emergent scaffolding

Section 4OA2: Identification and Resolution of Problems

Procedures
1-CHM-SAM-3.19, Chemical Addition Tank

Condition Reports
11-91539 11-88088 11-88466

Section 4OA3: Event Response

Condition Reports
09-65702 11-91077 11-90528

Procedures
2OM-52.4.R.1.A, Station Shutdown Mode 1 to Mode 6 Administrative and Local Actions, Rev. 6
1OM-24.4.T, Draining and Refill of the Steam Generators, Rev. 18
2OM-25.4.D, Draining Steam Generators in Cold Shutdown, Rev. 8

Other
2R15-04-MNI-006

LIST OF ACRONYMS

ADM	Administrative Procedure
ALARA	As Low As is Reasonably Achievable
AMC	ALARA Management Committee
AMS	Airborne Monitoring System
AOP	Abnormal Operating Procedure
AP	ALARA Plan
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
BCO	Basis for Continued Operations
BMI	Bare Metal Examination/Inspection
BVPS	Beaver Valley Power Station
CAP	Corrective Action Program
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
CR	Condition Report(s)
CRDM	Control Rod Drive Mechanism
CREVS	Control Room Emergency Ventilation System
DMBW	Dissimilar Metal Butt Welds
DPW	Declared Pregnant Workers
ECT	Eddy Current Testing
EDG	Emergency Diesel Generator
FA	Functionality Assessments
FENOC	First Energy Nuclear Operating Company
IMC	Inspection Manual Chapter
IOD	Immediate Operability Determination
IP	Inspection Procedure
IQDA	Independent Quality Data Analyst
ISI	Inservice Inspection
LCO	Limiting Conditions for Operations
LER	Licensee Event Report
LHRA	Locked High Radiation Areas
MR	Maintenance Rule
MSHA	Mine Safety and Health Administration
MSP	Maintenance Surveillance Package
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NIOSH	National Institute for Occupational Safety and Health
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
OD	Operability Determinations
OST	Operations Surveillance Test
PI	Performance Indicator
PI&R	Problem Identification and Resolution
POD	Prompt Operability Determination
PMT	Post Maintenance Testing
PT	Liquid Penetrant Test

PVN	Permeability Variation
RBC	Reactor Building Containment
RCA	Radiological Controlled Area
RPV	Reactor Pressure Vessel
RWP	Radiation Work Permit
SG	Steam Generator
SCBA	Self Contained Breathing Apparatus
SSC	Structures, Systems, and Components
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Test
VHRA	Very High Radiation Area
VT	Visual Examination