

September 18, 2006

EA-06-215

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

SUBJECT: BEAVER VALLEY POWER STATION - NRC EVALUATED EMERGENCY  
PREPAREDNESS EXERCISE INSPECTION REPORT 05000334/2006009 AND  
05000412/2006009

Dear Mr. Lash:

On August 22, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Beaver Valley Power Station (BVPS), which evaluated the performance of your emergency response organization during the June 27, 2006, exercise and the post-exercise critique conducted on June 29, 2006. The inspectors briefed your staff regarding the preliminary results of this inspection on June 29, 2006. Subsequent to the onsite portion of this inspection, the team conducted additional interviews and discussions with your staff and examined additional documents. The NRC conducted the exit meeting for this inspection with you and members of your staff via telephone conference on August 22, 2006.

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 emergency plan procedures and previous drill reports, observed the exercise activities, and interviewed selected emergency preparedness personnel from your staff.

This report documents one finding concerning the performance of your staff related to the dose projections and protective action recommendations made during the exercise. Specifically, the NRC inspection team noted that your dose assessment team made dose projections without a sound technical basis for some of the inputs, in that the technical support center staff was not relied on to characterize the source of the release nor to determine a projected release duration. This deficiency is similar to an NRC-identified weakness in your May 2004 exercise, which was detailed in NRC Inspection Report Numbers 05000334/2004008 and 05000412/2004008. Facility licensees, such as BVPS, are required by 10 CFR 50, Appendix E, Section IV.F.2.g, to correct all exercise critique weaknesses, including those identified by the NRC. The 2006 NRC team reviewed your staff's corrective actions for the 2004 exercise weakness and determined that those corrective actions had not been effective in that a similar weakness recurred in the 2006 exercise.

This finding was assessed using the emergency preparedness Significance Determination Process (SDP) and was preliminarily determined to be White (i.e., a finding with some increased importance to safety, which may require additional NRC inspection). The finding appears to have low to moderate safety significance because not adequately correcting the BVPS process for dose projection may adversely impact the timeliness and adequacy of PARs made in the event of a radiological release from BVPS.

This finding is an apparent violation of NRC requirements specified in 10 CFR 50, Appendix E, Section IV.F.2.g, and is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current policy is included on the NRC's website at <http://www.nrc.gov>; select **What We Do, Enforcement**, then **Enforcement Policy**.

We believe that we have sufficient information to make our final risk determination for the performance issue involving the inadequate corrective actions for a previously-identified emergency preparedness exercise weakness. However, before the NRC makes a final decision on this matter, we are providing you an opportunity to: (1) present to the NRC your perspective on the facts and assumptions used by the NRC to arrive at the finding and its significance at a Regulatory Conference, or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of receipt of this letter and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation and a press release will be issued to announce it. If you decide to provide a written response in lieu of the Regulatory Conference, the submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Mr. Raymond Lorson at (610) 337-5282 within 10 business days of the date of this letter to notify the NRC of your intentions. If we have not heard from you within that time, we will continue with our significance determination and enforcement decision, and you will be advised by separate correspondence of the results of our deliberations on this matter. Since the NRC has not made a final determination in this matter, no Notice of Violation is being issued for the inspection finding at this time. In addition, please be advised that the characterization of the apparent violation described in this letter may change as a result of further NRC review.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, 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 Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

A. Randolph Blough, Director  
Division of Reactor Safety

J. Lash

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Enclosure: Inspection Report 05000334/2006009 and 05000412/2006009  
w/Attachments: Supplemental Information

cc w/encl:

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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: 05000334/2006009, 05000412/2006009

Licensee: FirstEnergy Nuclear Operating Company

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, Pennsylvania 15077

Dates: June 26 - August 22, 2006

Inspectors: S. Barr, Senior Emergency Preparedness Inspector (Lead)  
S. LaVie, Senior Emergency Preparedness Specialist (NSIR)  
P. Cataldo, Senior Resident Inspector  
D. Werkheiser, Resident Inspector  
M. Brown, Operations Engineer

Approved by: Raymond K. Lorson, Chief  
Plant Support Branch 1  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

IR 05000334/2006009, 05000412/2006009; 06/26/2006 - 08/22/2006; Beaver Valley Nuclear Power Station, Units 1 and 2; Exercise Evaluation.

The report documents an inspection of the Beaver Valley emergency preparedness exercise conducted on June 27, 2006. The inspection was conducted by NRC regional and headquarters inspectors. One apparent violation (AV) with potential low to moderate safety significance was identified (Preliminary White). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Emergency Preparedness

- Preliminary White. The inspector identified an apparent violation for the licensee's failure to provide adequate corrective actions to a previously-identified emergency preparedness exercise weakness. 10 CFR 50, Appendix E, Section IV.F.2.g, requires that any emergency preparedness weakness or deficiency that is identified shall be corrected. An apparent violation of that requirement was identified involving the licensee's failure to adequately correct a performance deficiency in the area of Protective Action Recommendation development identified by the NRC in the May 2004 evaluated exercise. Specifically, in the 2006 exercise, the licensee dose assessment team did not adequately consider plant-specific situational information to develop the best dose projection estimate achievable at the time, which was an apparent repeat of a problem exhibited in the 2004 exercise. The licensee's 2006 performance regarding the development of a dose projection without a sound technical basis demonstrated that the licensee had implemented ineffective corrective actions for the 2004 inspection finding.

This finding is greater than minor because it is associated with the Emergency Response Organization Performance attribute and affected the objective of the Emergency Preparedness Cornerstone to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The Emergency Preparedness SDP, Section 5.3, Failure to Correct Drill or Exercise Weaknesses, was used to evaluate the significance of this finding. Because the licensee's corrective actions were not adequate and the weakness involved a Risk Significant Planning Standard area that is not covered by performance indicators (i.e., 10 CFR 50.47(b)(9)), a loss of planning standard function was assessed, resulting in a White finding. (Section 1EP1)

## Report Details

### 1. REACTOR SAFETY

Cornerstone: Emergency Preparedness (EP)

#### 1EP1 Exercise Evaluation (71114.01 - 1 Sample)

##### a. Inspection Scope

Prior to the exercise, an in-office review was conducted of the exercise objectives and scenario submitted to the NRC to determine if the exercise would test major elements of the emergency plan as required by 10 CFR 50.47(b)(14). The evaluation of the licensee's performance during the exercise is described below. Overall, this inspection activity represents the completion of one sample on a biennial cycle.

The exercise evaluation consisted of the following review and assessment:

- The adequacy of Beaver Valley's performance in the biennial full-participation exercise regarding the implementation of the risk-significant planning standards (RSPS) in 10 CFR 50.47(b)(4), (5), (9) & (10) which are emergency classification, offsite notification, radiological assessment, and protective action recommendations, respectively.
- The overall adequacy of Beaver Valley's emergency response facilities with regard to NUREG-0696, "Functional Criteria for Emergency Response Facilities," and Emergency Plan commitments. The facilities assessed were the control room simulator, the Technical Support Center (TSC), the Operations Support Center (OSC), and the Emergency Operations Facility (EOF).
- Other performance areas, such as the emergency response organization's (ERO's) recognition of abnormal plant conditions, command and control, intra- and inter-facility communications, prioritization of mitigation activities, utilization of repair and field monitoring teams, interface with offsite agencies, staffing and procedure adequacy, and the overall implementation of the emergency plan and its implementing procedures.
- Past performance issues from the last NRC exercise report and Beaver Valley's drill reports to determine effectiveness of corrective actions as demonstrated during this exercise to ensure compliance with 10 CFR 50.47(b)(14).
- The post-exercise critique to evaluate Beaver Valley's self-assessment of its ERO performance during the exercise and to ensure compliance with 10 CFR 50, Appendix E.IV.F.2.g.

The inspectors reviewed the documents listed in the Attachment to this report.

Enclosure

b. Findings

Introduction. The inspectors identified an apparent violation of 10 CFR 50 Appendix E, Section IV.F.2.g, for failure to correct a previously identified exercise weakness. Specifically, the inspectors identified a performance deficiency in the licensee's method of dose projection, potentially affecting their ability to make the proper protective action recommendation (PAR). This performance issue appeared to be similar to a weakness that the licensee failed to critique in the May 2004 exercise, which was documented in NRC Inspection Report 50-334 & 412/2004008.

Description The 2006 exercise scenario involved a containment bypass event, where the offsite dose occurred primarily due to an exothermic reaction in the charcoal filter beds, releasing the accumulated radiological particulates into the atmosphere. The licensee Environmental Assessment and Dose Projection (EA&DP) team did dose calculations assuming a one-hour release, not as a default number, but because they believed the duration of the release could not be estimated. This assumption was clearly recognized by the remainder of the EA&DP team. When the plant conditions indicated the release would last greater than one hour, the EA&DP team performed an additional dose assessment and suggested to the states that the second assessment be added to the first. These activities were performed in accordance with site procedures (e.g., Procedure 1/2-EPP-IP-2.6.3, Step 8.1.2.4.1), which state that, "if the duration of the release cannot be estimated, then use 1.0 hour and repeat the projection as better data become available." The NRC team observed that the EA&DP team did not estimate the release duration, nor did they confer with the technical support center (TSC) staff to develop a technically-sound release duration estimate. The EA&DP team used this "non-default" one-hour release duration, rather than making a dose projection based on the actual current plant conditions.

In the 2004 evaluated exercise, the licensee EA&DP team performed dose projection calculations using the default one-hour release time. The use of the default release duration was invalid during this exercise because less than one full train of containment spray was available. The one-hour release projection is based in part on a design assumption that the operation of the containment spray will restore the containment to sub-atmospheric pressure within an hour. The EA&DP team was not aware of the degraded containment spray capability and used the default one hour release duration. The NRC team noted that licensee players in the TSC were aware that less than one full train of containment spray was available, yet they did not provide any technical input for the estimation of a projected release duration. The 2004 inspection concluded that, although EA&DP personnel were aware throughout the exercise of releases and release rates via the radiation monitors, the licensee used an invalid release duration time in the dose projections and that they also did not know the basis for the one hour release time. The NRC issued a Green Finding for the failure of the licensee exercise critique to identify an invalid radiological release duration time.

In both the 2004 and 2006 exercises, the licensee used a one-hour release duration after they did not obtain a release duration from the TSC. In both cases, since the exercise scenarios involved events which challenged the basis for the default one-hour release duration, the EA&DP team should have recognized that a projected release duration of greater than one hour would have been appropriate. As stated in the 2004 inspection report and as observed by the 2006 inspection team, this practice can reasonably be seen to adversely affect the PAR if the dose from subsequent hours results in a significant dose to the public. The lack of communication and technical analysis was not identified by the licensee as a contributing cause in their followup of the 2004 NRC finding, and no corrective actions were implemented in this regard. Similarly in the 2006 exercise, the EA&DP personnel did not obtain a release duration estimate from the TSC and resorted to the one-hour "non-default" release time. The licensee's reliance on using a one-hour release duration, and then repeating an analysis when better data became available, did not ensure the accurate assessment of the magnitude of the offsite release based on best-available information.

The NRC reviewed the licensee corrective actions implemented in response to the 2004 finding. Corrective actions included a review of: the Final Safety Analysis Report basis for the one hour duration; dose assessment processes and procedures; and associated training. The licensee concluded, in Condition Report (CR) 04-04232-01 and -04, that "the one hour default release time is appropriate for Beaver Valley Power Station and revision to the procedures referenced in this CA are not necessary." Further, CR 04-04966-01 concluded that "CR 04-04966 and CR 04-04232 were reviewed at Rad-Pro TAC Meeting 04-09" and "no further actions are required by RP training on these CR's because the conditions described in the CR's are addressed in the applicable Emergency Response training lessons."

The inspectors determined that the corrective actions had been narrowly focused on establishing the validity of the one-hour default release duration, and did not address the potential non-conservative impact of this default value on protective action recommendations. The licensee performed a review of the BVPS design basis accident release durations (ranging from 15 minutes to 30 days) and also considered default durations obtained from other sites. Although the licensee determined that one hour was valid, the basis of how the disparate release durations were reduced to a generally applicable one-hour default was not evident. Since the licensee determined the one-hour default as being adequate, corrective actions were largely limited to adding a precaution requiring users to consider the bases of the default duration, with an explicit example of "...one full train of containment sprays, etc..." The inspectors determined that the dose assessment procedure emphasis remained focused on the one-hour default, rather than on developing an estimated release duration based on plant-specific information. Changes to licensee emergency response organization computer-based training were apparently limited to cross-referencing the added precautions. Based on the observation of the 2006 exercise, the NRC inspectors determined that the corrective actions had been ineffective. Specifically, the EA&DP personnel did not request nor receive any technical assessment of the radiation release duration from the TSC and used the "non-default" one-hour duration when it was not supported by the plant condition. The licensee continued to make dose projections without a sound

technical basis, which had the potential to adversely impact the timeliness and accuracy of the PARs.

Analysis. The inspectors determined that the licensee did not take adequate corrective actions (e.g., proper procedure changes) to prevent recurrence of the weakness identified in the 2004 evaluated exercise, which was the failure to determine a sound technical basis for the release projection time used in the formulation of PARs. Therefore, the performance deficiency in the 2006 exercise was the failure to correct an exercise weakness, as required by 10CFR50.47(b)(14). The observed weakness directly related to the licensee's ability to provide adequate methods for assessing actual or potential offsite consequences of a radiological emergency condition, as required by 10 CFR 50.47(b)(9). NRC Manual Chapter 0609, Appendix B, Emergency Preparedness Significance Determination Process, states, under Section 5.3, Failure to Correct Drill or Exercise Weakness:

“If corrective actions are not adequate and the WEAKNESS involves a Risk Significant Planning Standard (RSPS) area that is not covered by the DEP PI (e.g., 10 CFR 50.47(b)(9)), the NRC staff should assess a LOSS OF PS FUNCTION (i.e., a White finding). All non-RSPS areas would be Green.”

In this case, the planning standard function lost was 10CFR50.47(b)(14), which requires licensees to correct deficiencies identified as a result of exercises and drills. The licensee's failure to comply with this standard is the entry point in Sheet 1 of the EP SDP. The specific problem was a planning standard problem, but not a risk significant planning standard problem. The Sheet 1 logic shows that a planning standard problem that results in a planning standard function failure (as the above citation from the SDP Section 5.3 defines) is a White finding.

Enforcement. 10 CFR 50 Appendix E, Section IV.F.2.g requires, in part, that any weaknesses or deficiencies that are identified in an emergency preparedness exercise shall be corrected. Contrary to that requirement, FENOC failed to adequately correct a performance deficiency in the area of PAR development identified by the NRC in the May 2004 evaluated exercise. Specifically, in the 2006 exercise the licensee dose assessment team failed to consider plant-specific situational information to develop the best dose projection estimate achievable at the time, which was a repeat of the deficiency exhibited in the 2004 exercise. This finding is identified as an apparent violation in accordance with Section VI.A.5.b of the NRC Enforcement Policy. **(AV 05000334/2006009-01, 05000412/2006009-01)**

#### 4. OTHER ACTIVITIES (OA)

##### 4OA1 Performance Indicator (PI) Verification (71151- 3 Samples)

###### a. Inspection Scope

The inspectors reviewed data for the EP PIs which are: (1) Drill and Exercise Performance (DEP); (2) ERO Drill Participation; and (3) Alert and Notification System (ANS) Reliability. The inspectors reviewed supporting documentation from drills and tests from all four quarters of 2005, and the first quarter of 2006, to verify the accuracy of the reported data. The review of these performance indicators was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria used for the review were 10 CFR 50.9 and NEI 99-02, Revision 2, "Regulatory Assessment Performance Indicator Guidelines." This inspection activity represented the completion of three samples on an annual cycle.

###### b. Findings

No findings of significance were identified.

##### 4OA6 Meetings, including Exit

The inspectors presented the preliminary inspection results to Mr. James Lash, Beaver Valley Power Station Vice President, and other members of the licensee's staff, at the conclusion of the onsite inspection on June 29, 2006. Due to the preliminary nature of those results, the NRC inspection team subsequently conducted additional in-office inspection activities, including interviews and discussions with BVPS staff and the examination of additional documentation. The NRC conducted an exit meeting via telephone conference call with Mr. Lash and other members of his staff on August 22, 2006. No proprietary information was provided to the inspectors during this inspection.

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

J. Lash, Vice President, Beaver Valley Power Station  
G. Halnon, Director, FENOC Fleet Regulatory Affairs  
S. Vicinie, Manager, Beaver Valley Emergency Preparedness

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

Opened

05000334/2006009-01, 05000412/2006009-01	AV	Failure to provide adequate corrective actions to a previously-identified emergency preparedness exercise weakness.
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Closed

None.

Discussed

None.

**LIST OF DOCUMENTS REVIEWED**

**Section 1EP1: Exercise Evaluation**

BVPS Emergency Plan  
BVPS Emergency Plan Implementing Procedures  
BVPS Evaluated Exercise Executive Summary  
BVPS Evaluated Exercise Scope and Objectives  
BVPS Evaluated Exercise Scenario and Radiological Release Data  
BVPS Evaluated Exercise Event Logs  
Procedure 1/2-EPP-I-5, General Emergency (Revision 22)  
Procedure 1/2-EPP-IP-2.6, Environmental Assessment and Dose Projection Controlling Procedure (Revision 17)  
Procedure 1/2-EPP-IP-2.6.1, Dose Projection - Backup Methods (Revisions 13)

Procedure 1/2-EPP-IP-2.6.2, Dose Projection - ARERAS/MIDAS With FSAR Defaults (Revision 13)  
Procedure 1/2-EPP-IP-2.6.3, Dose Projection - ARERAS/MIDAS With Real Time Inputs (Revisions 11, 12, and 13)  
Procedure 1/2-EPP-IP-2.6.4, Dose Projection - ARERAS/MIDAS With Manual Inputs (Revisions 12, 13, and 14)  
Procedure 1/2-EPP-IP-2.6.5, Alternate Meteorological Parameters (Revision 11)  
Procedure 1/2-EPP-IP-2.6.6, Dose Projection By hand Calculation Known Isotopic Release (Revision 7)  
Procedure 1/2-EPP-IP-2.6.7, Release Source Term Determination Based On Field Measurements (Revision 9)  
Procedure 1/2-EPP-IP-2.6.8, Dose Assessment Based On Environmental Measurements and Samples (Revision 7)  
Procedure 1/2-EPP-IP-2.6.9, Integrated Dose Assessment (Revision 7)  
Procedure 1/2-EPP-IP-2.6.10, Ground Contamination Assessment and Protective Actions (Revision 8)  
Procedure 1/2-EPP-IP-2.6.11, Dose Projections Miscellaneous Data (Revision 12)  
Procedure 1/2-EPP-IP-2.6.12, Dose Projections - ARERAS/MIDAS With Severe Accident Assessment (Revision 10)  
Procedure 1/2-EPP-IP-4.1, Offsite Protective Actions (Revisions 17, 18, 19, 20, 21 and 22)  
CR 04-04063, ERO Evaluated Exercise Recognition of Equipment Failure  
CR 04-04071, Evaluated Exercise: Improve Methods for Determining Release Duration  
CR 04-04081, Logic in Initial PAR Did Not Meet Procedural Requirements  
CR 04-04232, Evaluated Exercise Potential Green Finding for Critique Failure  
Supplemental Information from the BVPS Evaluated Exercise (dated July 10, 2006)  
Additional Information from the BVPS Evaluated Exercise (dated July 12, 2006)  
Additional Information from the BVPS Evaluated Exercise (dated August 3, 2006)  
Emergency Recovery Manager Training Material  
EA&DP and Environmental Personnel Training Material

**Section 40A1:Performance Indicator Verification**

Procedure 1/2-ADM-1111, NRC EPP Performance Indicator Instructions  
Drill and Exercise Performance PI Data, January 2005 - March 2006  
ERO Drill Participation PI Data, January 2005 - March 2006  
Alert and Notification System Reliability PI Data, January 2005 - March 2006

**LIST OF ACRONYMS**

ANS	Alert and Notification System
CFR	Code of Federal Regulations
CR	Condition Report
DEP	Drill and Exercise Performance
EA&DP	Environmental Assessment and Dose Projection
ERO	Emergency Response Organization
EOF	Emergency Operations Facility
EP	Emergency Preparedness
ERO	Emergency Response Organization
FSAR	Final Safety Analysis Report
NRC	Nuclear Regulatory Commission
OSC	Operations Support Center
PAR	Protective Action Recommendation
PI	Performance Indicator
RSPS	Risk Significant Planning Standard
TSC	Technical Support Center