

August 6, 2007

Mr. Peter P. Sena III
Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
PO Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC EMERGENCY PREPAREDNESS
SUPPLEMENTAL INSPECTION REPORT 05000334/2007503 AND
05000412/2007503

Dear Mr. Sena:

On June 28, 2007, the US Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure 95001 at your Beaver Valley Power Station. The inspection involved a White finding regarding station dose assessment processes. The enclosed inspection report documents the inspection results, which were discussed with you and other members of your staff, at the exit and regulatory performance meetings conducted on June 28, 2007. The NRC was informed of your readiness for the inspection on June 1, 2007.

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

Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure 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).

Sincerely,

/RA/

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

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James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

SUNSI Review Complete: JMT (Reviewer's Initials)

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P. Sena

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

Enclosure: Inspection Report 05000334/2007503 and 05000412/2007503
w/Attachment: Supplemental Information

cc w/encl:

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U. S. NUCLEAR REGULATORY COMMISSION REGION I
REGION I

Docket Nos. 50-334, 50-412

License Nos. DPR-66, NPF-73

Report Nos. 05000334/2007503 and 05000412/2007503

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Post Office Box 4
Shippingport, PA 15077

Dates: June 26-28, 2007

Inspectors: S. Barr, Senior Emergency Preparedness Inspector, Region I

Approved by: James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000334/2007503, IR 05000412/2007503; 06/26/2007 - 06/28/2007; Beaver Valley Power Station, Units 1 & 2; Supplemental Inspection Report.

This was an announced inspection conducted by one region-based inspector. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstone: Emergency Preparedness

The U. S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection to assess FirstEnergy's evaluation associated with the Beaver Valley dose assessment process for determining Protective Action Recommendations (PARs). This performance issue was previously characterized as having low to moderate risk significance (White) in NRC Inspection Report Nos. 05000334/2006009 and 05000412/2006009. During this supplemental inspection, performed in accordance with Inspection Procedure 95001, the inspector determined that FirstEnergy had performed a comprehensive evaluation of the dose assessment procedure and staff performance issues. The licensee's evaluation determined that the root cause for the issue to be "rule based error" due to a mind set by the emergency response staff. Specifically, a "rule" had been adopted, proceduralized, and taught that directed the assignment of a one-hour release duration for a radiological release if information was not sufficient to estimate a more accurate projection. Using a one-hour default value became the common practice even when information was available to estimate a more accurate projected duration. FirstEnergy implemented corrective actions that addressed the root and contributing causes. They also conducted an extent-of-condition review for other station emergency preparedness and other discipline procedures to ensure they were consistent with regulatory and industry guidance.

Given the licensee's acceptable performance in addressing the dose assessment deficiency, the white finding associated with this issue will only be considered in assessing plant performance through the second quarter of 2007, in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." Further implementation of the licensee's corrective actions may be reviewed during future inspections.

Report Details

01. INSPECTION SCOPE

The U.S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection to assess FirstEnergy's evaluation for an issue associated with the Beaver Valley dose assessment process and its ability to provide Protective Action Recommendations (PARs). This performance issue was characterized as having low to moderate risk significance (White) in NRC Inspection Report Nos. 05000334/2006009 and 05000412/2006009, and is related to the emergency preparedness (EP) cornerstone in the reactor safety strategic performance area.

This inspection report documents the findings of the NRC 95001 supplemental inspection conducted to review the Beaver Valley dose assessment procedure and practice issues. The inspection scope included a review of the following: (1) root cause investigation report (Condition Report (CR) 06-11366); (2) corrective action program reports (CAPs); (3) EP program procedures; (4) extent of condition determination; and (5) adequacy of both the completed and long term corrective actions. The inspector interviewed the root cause team leaders and several members of the Beaver Valley emergency response organization (ERO). The inspector also observed ERO member performance in an emergency preparedness table-top drill.

02. EVALUATION OF INSPECTION REQUIREMENTS

02.01 Problem Identification

a. Determination of who identified the issue and under what conditions

The NRC identified this performance issue during an emergency preparedness exercise inspection performed in June 2006. The NRC identified the inappropriate use of a one-hour default release duration projection and weak communication between the dose assessment team in the emergency operations facility and the engineering staff in the technical support center.

b. Determination of how long the issue existed, and prior opportunities for identification

The NRC identified this finding during a June 2006 exercise evaluation inspection. The licensee's root cause report indicated that the issue was a legacy issue and had been in place for "numerous years." The root cause investigation also found that a number of prior opportunities existed (e.g., the station annual procedure review, an industry survey, human performance tools, and a 2004 NRC inspection finding) for problem identification and corrective actions.

c. Determination of the plant-specific risk consequences (as applicable) and compliance concerns associated with the issue

The plan-specific risk was described in the NRC final significance determination letter (issued December 12, 2006) as: "... the Beaver Valley Power Station (BVPS) PAR development process capability was degraded by the dose assessment procedure

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deficiency, in that the procedure, under certain circumstances (i.e., events not explicitly described in the Final Safety Analysis Report or not having a release duration less than or equal to one hour) could result in untimely PARs, potentially affecting the populated areas within 5 to 10 miles of the site.”

The compliance aspect of this finding was related to risk significant planning standard 10 CFR 50.47(b)(9), which requires, in part, that adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use. Contrary to that requirement, as of the June 2006 emergency exercise, the method for assessing actual and potential offsite consequences of an offsite radiological release was inadequate.

02.02 Root Cause and Extent of Condition Evaluation

a. Evaluation of methods used to identify the root causes and contributing causes

The licensee’s evaluation of this finding utilized a combination of structured root cause analysis techniques, including: (1) event and causal factor charting; (2) a “Why Staircase”; (3) Barrier Analysis and (4) Human Performance Evaluation System (HPES) charting. The root cause conclusions were validated using the TapRoot root cause tree methodology. The inspector found the evaluation methods used by the licensee to be acceptable.

b. Level of detail of the root cause evaluation

The licensee root cause evaluation was thorough and identified the primary root cause was a “mind set” that inappropriately instituted a procedure requirement to use one hour default rather than to develop a more accurate projection. The root and contributing causes efforts used techniques such as analysis of barriers and human factors, and identified process and organizational errors that led to the finding. The “Why Staircase” analysis went five levels deep, and the HPES data sheets provided a broad analysis of organizational behaviors, personnel interface and equipment conditions, supervisory methods, and staff training. The inspector concluded that FirstEnergy’s root cause evaluation had been performed to an appropriate level of detail.

c. Consideration of prior occurrences of the problem and knowledge of prior operating experience

The licensee’s evaluation included a review to identify if similar problems had previously been reported with dose assessment issues. The FirstEnergy condition report (CR) 06-11366 root cause report identified that a 2004 NRC finding and prior industry surveys were opportunities where they could have self-identified and addressed the dose assessment issue. A review of the condition report database identified eight related CRs that were associated with the NRC’s findings. The inspector noted that previous occurrences and operating experience examples were appropriately considered in the licensee’s corrective action plans for this finding.

d. Consideration of potential common cause(s) and extent of condition of the problem

The licensee's extent-of-condition and common cause reviews included an internal benchmark review of other assumptions and defaults used in all Beaver Valley Power Station (BVPS) emergency plan implementing procedures. The licensee also intended to sustain this effort as part of the annual procedure review process. FirstEnergy also conducted an industry survey to provide benchmark information concerning the guidance and the bases of other dose assessment programs, and this information was factored into corrective action development. The inspector concluded that FirstEnergy's evaluation properly assessed the potential for common causes and the extent of the root cause condition at BVPS.

e. Consideration of safety culture components by the root cause evaluation, extent of condition, and extent of cause

The CR 06-11366 root cause report did not provide any discussion of safety culture aspects related to the White finding, therefore, the report did not have any indications of safety culture issues. FirstEnergy performed a self-assessment of their readiness for this 95001 inspection, and part of that assessment was a review of the root cause report. Recognizing that the root cause report did not address potential safety culture issues, the team that conducted the readiness assessment interviewed the root cause analysis team and determined there were no safety culture issues associated with the dose assessment issue. The inspector determined that the licensee effort adequately captured the potential for any safety culture aspects of the performance deficiency.

02.03 Corrective Actions

a. Appropriateness of corrective actions

The root cause report (CR 06-11366) identified appropriate corrective actions to resolve the identified root and contributing causes for this issue. The corrective actions included: (1) dose assessment implementing procedure revision; (2) revising the default release duration time from one hour to six hours; (3) emergency response organization (ERO) training; (4) a series of emergency preparedness (EP) table-top drills emphasizing the new dose assessment practices and expectations; and (5) an effectiveness review of the validation for CR 06-11366. The inspector determined the corrective actions to be well-developed and appropriate to address the performance issue.

b. Prioritization of corrective actions

The inspector determined that the corrective actions derived from the root cause report (CR 06-11366) had been generated and implemented at a pace commensurate with their significance and were properly prioritized. The inspector concluded that FirstEnergy's approach to the implementation of corrective actions was an appropriate method to influence emergency response organization behavior in the area of dose assessment.

- c. Establishment of a schedule for implementing and completing the corrective actions

At the time of this supplemental inspection, all of the licensee's corrective actions had been scheduled and implemented. The licensee's EP implementing procedures and the default release duration time had been revised, and the ERO training on the procedures had been completed. Drilling of the ERO response teams had been initiated, with an emphasis being placed on technically-sound estimations of release duration times and use of the new six-hour default duration time. Assessment of the ERO's performance was being tracked and fed back to the ERO members.

- d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence

The inspector determined that FirstEnergy's plans contained sufficient methods for determining the effectiveness of their corrective actions to prevent recurrence. An effectiveness review was included as a corrective action in CR 06-11366 and was designed to provide further management follow-up and assessment of the program changes which resulted from this issue. FirstEnergy intended to use the routine EP drill and exercise program to ensure that ERO performance continues to demonstrate effective implementation of the program changes and that the organization has internalized the proper sensitivity to radiological release duration related to dose assessment. The inspector noted that drills conducted to date had shown improved performance by the BVPS ERO.

03. MANAGEMENT MEETINGS

Exit Meeting Summary

On June 28, 2007, the inspector presented the inspection results to Mr. Peter Sena, Beaver Valley Power Station Site Vice President, and other members of the licensee's staff. Immediately following the exit meeting, a Regulatory Performance Meeting was conducted in accordance with NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," to address the closure of the White finding. No proprietary information was provided to the inspector during this inspection.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

S. Vicinie, Emergency Preparedness Manager
B. Sepelak, Compliance Supervisor

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

05000334/2006009-01, 05000412/2006009-01 VIO Inadequate dose assessment procedure

LIST OF DOCUMENTS REVIEWED

Procedures

1/2-EPP-IP-2.6, Environmental Assessment and Dose Projection Controlling Procedure (Rev. 21)
1/2-EPP-IP-2.6.1, Dose Projection - Backup Methods (Rev. 16)
1/2-EPP-IP-2.6.3, Dose Projection - ARERAS/MIDAS With Real-Time Inputs (Rev. 16)
1/2-EPP-IP-2.6.4, Dose Projection - ARERA/MIDAS With Manual Inputs (Rev. 17)

Condition Reports (CRs)

06-11366, White Finding for Inadequate Dose Assessment Procedures (Origination Date December 13, 2006)
06-4125, 06 Eval Ex - Preliminary NRC White Finding For Dose Projections (June 29, 2006)
06-4183, 1 Hour As The Default Time For Dose Projections May Not Be Industry Best Practice (July 6, 2006)
06-6677, NRC Inspection Report For BVPS 2006 ERO Evaluated Exercise - Preliminary White Finding (September 25, 2006)
06-6699, Incorrect Procedure Tie In 1/2-EPP-IP-2.6 (September 25, 2006)
06-9066, Enhancement To Dose Projection Process - Unknown Release Durations (October 30, 2006)
07-12219, Evaluate The Basis For Default Accident Type Determination (January 5, 2007)
07-12240, Evaluate The Basis For Assumptions In Dose Projection (January 5, 2007)

07-12271, Evaluate The Basis For Assumptions In Procedures 1/2-EPP-IP-2.6.5 & 2.6.6
(January 5, 2007)

Other

Beaver Valley Power Station Reply to Notice of Violation - EA-06-215 (Dated January 11, 2007)
Beaver Valley 95001 Readiness Assessment Report for the June 26th 2007 NRC 95001
Inspection (June 18-22, 2007)

LIST OF ACRONYMS

| | |
|------|-------------------------------------|
| BVPS | Beaver Valley Power Station |
| CR | Condition Report |
| EAL | Emergency Action Level |
| EP | Emergency Preparedness |
| ERO | Emergency Response Organization |
| HPES | Human Performance Evaluation System |
| PAR | Protective Action Recommendation |