

April 30, 2003

EA-03-054  
Mr. M. Bezilla  
Vice President  
FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
Post Office Box 4  
Shippingport, Pennsylvania 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC INSPECTION REPORT 50-334/03-006, 50-412/03-006

Dear Mr. Bezilla:

On February 24-28, 2003, the U.S. Nuclear Regulatory Commission (NRC) conducted an emergency preparedness (EP) supplemental inspection and program inspection at your Beaver Valley Power Station (BVPS), Units 1 & 2. The NRC then conducted an in-office inspection from March 14-26, 2003, of additional information provided by your staff concerning the ability of your emergency response organization to meet the Emergency Preparedness Plan (EPP) staffing requirements for emergencies (included as Attachment 2 of the enclosed report). This information was provided via a March 14 e-mail from Ms. Susan Vicinie, EP Manager, to Mr. Jeff Laughlin, NRC Region I. Lastly, the NRC conducted an in-office inspection from April 17-29, 2003 of: 1) the additional extent of condition investigation which your staff documented in Corrective Action (CA) #24 to Condition Report (CR) 02-02202 and 2) the PHAD issue effectiveness review documented in CA #12 to the same CR (These two documents are included as Attachment 3 of the enclosed report). This information was provided to Mr. Laughlin via facsimile by Ms. Vicinie on April 17 and 28.

The supplemental inspection was conducted to assess the evaluation and corrective actions associated with the testing and maintenance of Personal Home Alerting Devices (PHADs), an integral part of the BVPS public alert and notification system (ANS), which was not maintained to perform its design function. This issue resulted in a violation with White significance which was documented in Inspection Report No. 50-334/02-003 and 50-412/02-003. The enclosed report documents the supplemental and program inspection findings, which were discussed on February 28, 2003, with yourself and other members of your staff. The report also documents the results of our in-office reviews that were discussed via telephone on March 26 and April 30, 2003, with you and your staff.

The inspection examined activities conducted under your licensee as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed the response to an actual Notification of Unusual Event on February 24, 2003, and interviewed personnel.

Based on the results of this inspection, the inspector identified one preliminary finding of low to moderate safety significance (White). The finding is associated with a failure to ensure that timely augmentation of emergency response capabilities was maintained. Specifically, there was a question as to whether 12 radiation protection (RP) technician augmented positions, required by your EPP, could be staffed in a timely manner. The capability to augment the shift

with these personnel had never been tested before January 31, 2003, and your unannounced activation drill on that date revealed that only one of twelve positions could be filled in the required time resulting in a substantial change to the call-out process. Using Inspection Manual Chapter 0609, "Significance Determination Process (SDP)," Appendix B, Section 5, "Failure to Meet a Planning Standard," and Sheet 1 of the SDP, the finding was preliminarily determined to be White, having low to moderate safety significance.

The inspector concluded that there was no immediate safety concern due to the interim compensatory measures which were implemented by your staff. Specifically, the RP technicians were added to your automated call-out system and 16 supervisory personnel with RP expertise and travel times of less than 50 minutes were identified to fill the augmented RP positions until the arrival of a sufficient number of RP technicians.

The finding was also determined to be an apparent violation of NRC requirements and is being considered for escalated enforcement action in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's website at [www.nrc.gov/what-we-do/regulatory/enforcement.html](http://www.nrc.gov/what-we-do/regulatory/enforcement.html).

We believe that we have sufficient information to make a final significance determination for failure to ensure that timely augmentation of emergency response capabilities was maintained. However, before we make a final decision, you have the opportunity to either provide a written response or to request a Regulatory Conference where you would be able to provide your perspectives on the significance of the finding, the basis for your position, and whether you agree with the apparent violation. If you choose to request a Regulatory Conference, we encourage you to submit your evaluation and any difference with the NRC evaluation 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. The NRC will also issue a press release to announce the Regulatory Conference. The Regulatory Conference should be scheduled within 30 days of the date of this letter.

Please contact Mr. Richard Conte at (610) 337-5183 within 10 business days of the date of this letter to inform the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision, and you will be advised by separate correspondence of the results.

Since the NRC has not made a final determination in this matter, a Notice of Violation is not being issued for this inspection finding at this time. In addition, please be advised that the characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review.

The supplemental inspection was conducted to determine if the root and contributing causes of the previous White finding concerning PHADs were understood, to assess the extent of the condition review, and to determine if the corrective actions for risk significant performance issues were sufficient to address causes and prevent recurrence. To accomplish these objectives, the inspector reviewed your root cause analysis and evaluation of extent of condition, and conducted an independent inspection to assess your conclusions.

Based on our review of the root cause analysis and associated corrective actions, the NRC concluded that, although the primary root cause and contributing causes properly identified the reasons for the finding, the extent of condition review was not of sufficient scope, in that it focused on EP issues alone. For example, the investigation included a self-assessment of EPP implementation only and the review of existing corrective actions was confined to the EP area, to ensure that there were no other issues affecting license conditions which may require interim compensatory measures. The investigation did not expand to other disciplines where there could be issues similar to the inadequate testing and maintenance of the PHADs. Additionally, the effectiveness review which your staff completed to assess the effectiveness of corrective actions focused solely on the siren hardware changes and did not cover the human performance issues which contributed to inadequate PHAD testing and maintenance.

Subsequently the NRC reviewed your extent of condition and updated corrective action effectiveness review, and concluded that there were no outstanding issues which would prevent the closure of the White finding associated with the PHADs.

In accordance with 10 CFR 2.790 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 for from the Publically Available Records (PARS) component of the 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).

If you have any questions, please contact me at (610) 337-5126.

Sincerely,

**/RA/ R. V. Crlenjak for:**

Wayne D. Lanning, Director  
Division of Reactor Safety

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

Enclosures: Inspection Report 50-334/03-006, 50-412/03-006

Mr. M. Bezilla

4

cc w/encl:

J. Lash, Plant General Manager

F. von Ahn, Director, Plant Engineering

T. Cosgrove, Director, Work Management

R. Donnellon, Director, Plant Maintenance

M. Pearson, Director, Services and Projects

L. Freeland, Manager, Nuclear Regulatory Affairs & Corrective Actions

M. Clancy, Mayor, Shippingport, PA

R. Janati, Chief, Division of Nuclear Safety

Commonwealth of Pennsylvania

State of Ohio

State of West Virginia

Distribution w/encl:

Region I Docket Room (with concurrences)

D. Kern, DRP - Senior Resident Inspector

H. Miller, RA

J. Wiggins, DRA

J. Rogge, DRP

R. Barkley, DRP

L. Larche, DRP

P. Maccaglia, Site Secretary

F. Congel, OE

S. Figueroa, OE

R. Borchardt, NRR

D. Dambly, OGC

D. Holody, EO, RI

R. Urban, ORA

T. McGinty, RI EDO Coordinator

R. Laufer, NRR

J. Andersen, NRR

D. Collins, PM, NRR

R. Clark, Backup PM, NRR

W. Lanning, DRS

R. Crlenjak, DRS

DRS File

DOCUMENT NAME: C:\ORPCheckout\FileNET\ML031210784.WPD

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

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

OFFICE	RI/DRS	RI/DRS	RI/DRS	RI/DRP	RI/ORA	RI/DRS
NAME	JLaughlin*	RConte*	ECobey*	RSummers*	DHolody/RJU for	WLanning
DATE	04/03/03	04/08/03	04/11/03	04/14/03	04/15/03	04/30/03

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

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

OFFICE	IIPB
NAME	CCarpenter(RJC for)
DATE	04/18/03(by e-mail)

OFFICIAL RECORD COPY

\*See Previous Concurrence Page

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 50-334, 50-412

License Nos: DPR-66, NPF-73

Report No: 2003-006

Licensee: First Energy Nuclear Operating Company

Facility: Beaver Valley Power Station

Dates: February 24 - February 28, 2003 (Onsite)  
March 14 - March 26, 2003 (Inoffice)  
April 17- April 30, 2003 (Inoffice)

Inspector: J. Laughlin, Operations Engineer, DRS

Approved by: Richard J. Conte, Chief  
Operational Safety Branch  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

IR 05000334/03-006, IR 05000412/03-006; on 02/24 - 04/30/2003; Beaver Valley Power Station, Units 1&2. Emergency Response Organization Augmentation; Supplemental Inspection Report - Violation - White significance.

The emergency preparedness (EP) program and supplemental inspections were performed onsite by a region-based inspector. The inspection identified one preliminary White finding. The significance of most findings are indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 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. Inspector Identified Findings

#### **Cornerstone: Emergency Preparedness**

- Preliminary White. The 12 augmented radiation protection (RP) technician responders (i.e., six to respond in 30 minutes (M) and six to respond in 60 M) in the Emergency Response Organization (ERO) were not capable of meeting the minimum and timely staffing requirements in Emergency Preparedness Plan (EPP), Section 5, Table 5-1. EPP Section 5.2 states that Table 5-1 identifies the staffing requirements and capabilities for additions of the ERO. Table 5-1 requires that 12 RP technicians must respond to augment the shift crew in the four functional areas of offsite surveys (two in 30M and two in 60M), onsite surveys (one in 30M and one in 60M), in-plant surveys (one in 30M and one in 60M), and in-plant protective actions (two in 30M and two in 60M).

This was an apparent violation of 10 CFR 50.47(b)(2) and the EPP for not ensuring that adequate and timely emergency response staffing, in the four stated functional areas, was maintained at all times. This finding was of low to moderate safety significance because staffing augmentation processes were not capable of ensuring augmentation of the initial response staff in accordance with EPP facility activation commitments for RP technicians. **(AV 50-334,412/03-006-01)** (Section 1EP3)

- The NRC performed the supplemental inspection to assess the licensee's evaluation and corrective actions regarding the inadequate maintenance and testing of the personal home alerting devices (PHADs), an integral part of the alert and notification system, to ensure that the design function of alerting essentially 100% of the public in the emergency planning zone could be met. This performance issue was previously characterized as having low to moderate safety significance (i.e. White) in NRC Inspection Report 50-334/02-003 and 50-412/02-003.

During this supplemental inspection, performed in accordance with Inspection Procedure 95001, the inspector determined that the licensee performed a comprehensive evaluation of the inadequate PHAD maintenance and testing. First Energy's evaluation identified the primary root cause of the performance issue to be the failure to administratively ensure that PHAD test procedures, acceptance criteria, maintenance programs and installation data were properly established and maintained. However, First Energy performed an extent of condition review which was not of

sufficient scope, in that it focused on EP issues alone. Additionally, the effectiveness review, completed to assess the effectiveness of corrective actions, focused solely on the siren hardware changes and did not cover the human performance issues which contributed to inadequate PHAD testing and maintenance.

Subsequent NRC review of a new extent of condition investigation documented in CA #24 to CR 02-02202 and effectiveness review documented in CA#12 to the same CR revealed that there were no remaining issues which would prevent the closure of the PHAD White finding.

B. Licensee Identified Violations

None



## Report Details

### BASELINE INSPECTION

#### **Emergency Preparedness (EP)**

##### 1EP2 Alert and Notification System (ANS) Testing

###### a. Inspection Scope

The inspector reviewed documentation regarding the siren system design and approval to determine system testing commitments. He also reviewed procedure EP-7, "Alert Notification System (Sirens) Maintenance and Testing," and siren testing documentation to verify compliance with testing commitments. The inspector interviewed the emergency preparedness (EP) manager and staff person responsible for ANS testing, concerning system design, operation and maintenance. He reviewed several licensee Condition Reports (CRs) to verify that siren deficiencies were being documented in the corrective action program and corrected. For example, he reviewed CR 02-09479 concerning the failure of two sirens during the 10/22/02 full system activation and CR 02-02013 concerning a siren failure during a quarterly growl test, for adequacy and resolution. Lastly, the inspector visited a new siren installation site in Columbiana County, Ohio, to verify the location was consistent with licensee documentation.

The inspector conducted the review in accordance with guidance provided in NRC Inspection Procedure 71114, Attachment 02, "Alert and Notification System Testing." The applicable planning standard, 10 CFR 50.47(b)(5) and related requirements in 10 CFR 50 Appendix E, Section IV.D were used as acceptance and reference criteria.

###### b. Findings

No findings of significance were identified.

##### 1EP3 Emergency Response Organization (ERO) Augmentation

###### a. Inspection Scope

The inspector reviewed the licensee's EPP commitments for ERO staffing and facility activation. He reviewed staff depth for key ERO positions on the three designated ERO duty teams to ensure that sufficient numbers of responders were available and performed a sampling review of training records to verify that responders were receiving training. Licensee staff provided the inspector with a demonstration of the ERO call-out procedure, which was reviewed and discussed in detail with responsible licensee staff. The inspector also reviewed documentation from recent pager tests conducted in accordance with procedure 1 / 2 OST-57.1, "Emergency Beeper Notification System," and the unannounced ERO activation drill (i.e., drill which required that ERO personnel actually report to the site when called) conducted on 1/31/03, with results documented in CR 03-01078. He reviewed two self-assessments concerning ERO augmentation (i.e., "ERO Paging Program" dated 12/30/99 and "ERO Augmentation" dated 6/1/01) and several CRs concerning test deficiencies to verify that augmentation issues were being documented and addressed. Lastly, the inspector observed ERO augmentation activities during an actual Notification of Unusual Event on 2/24/03.

The inspector conducted this review in accordance with the guidance in NRC Inspection Procedure 71114, Attachment 03, "Emergency Response Organization Augmentation." The applicable planning standard, 10 CFR 50.47(b)(2), related requirements in 10 CFR 50, Appendix E, and the licensee's EPP commitments were used as acceptance and reference criteria.

b. Findings

Introduction

During an ERO activation drill conducted by First Energy on January 31, 2003, the licensee determined that it took 95 minutes to staff the 12 radiation protection (RP) technician response positions. The inspector determined that the licensee's established controls were not capable of meeting the minimum and timely staffing requirements in EPP, Section 5, Table 5-1, for 30 and 60 minute RP technician ERO responders. This performance deficiency was an apparent violation of 10 CFR 50.47(b)(2) and the related EPP requirements for not ensuring that adequate and timely emergency response staffing in four functional areas was maintained at all times, a finding of low to moderate safety significance (White).

Description

First Energy's minimum staffing requirements for emergencies are found in the EPP, Section 5, Table 5-1. This requirement is, in part, to augment the shift with 12 RP technicians within 30 or 60 minutes (M) for the following four functions: offsite surveys (two in 30M, two in 60M), onsite surveys (one in 30M, one in 60M), in-plant surveys (one in 30M, one in 60M), and in-plant protective actions (two in 30M, two in 60M). These positions are filled by personnel who do not carry pagers and who are normally called one at a time by telephone to respond (not automated call-out). Before January 31, 2003, First Energy had not tested the capability to augment shift staff with these personnel and they are not called as part of the monthly pager test. However, EP staff conducted an unannounced activation drill (personnel actually reported to the site when called) on January 31, 2003 which revealed that only one of the 12 RP response positions was filled in the allowed time period. Full staffing of the positions did not occur until after 95 minutes had elapsed. This information resulted in interim compensatory measures and a substantial change in the call out process for RP technicians.

Analysis

The inspector determined that this finding was greater than minor because it adversely affected the ERO readiness attribute of the EP cornerstone objective of ensuring that the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency.

In accordance with IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process (SDP)," the inspector determined that this finding was White, low to moderate safety significance, because the finding constituted a failure to comply with regulatory requirement 10 CFR 50.54(q), and was a failure to meet planning standard 10 CFR 50.47(b)(2). The licensee documented this issue after the January 31 activation

drill in CR 03-01078, but did not recognize its relation to meeting this planning standard. Subsequent inspector review identified the issue as a White finding since, in light of conditions prior to the call out process changes in February 2003, the four RP technician augmented functions would not be completely met.

First Energy provided additional information via a March 14 e-mail from Ms. Susan Vicinie, EP Manager, to Mr. Jeff Laughlin, NRC Region I (Attachment 2). The information relates to the ability to meet the staffing requirements of EPP Table 5-1, and attempted to demonstrate that onshift and other augmented responders could fill the 12 designated RP response functions for a short period until such time as the necessary number of RP technicians had arrived onsite. Although First Energy management did not dispute the fact that BVPS was unable to implement the EPP, as written, to fill the 12 RP technician positions with qualified RP technicians, they believed that other responders could adequately fulfill the four RP position functions, thereby potentially reducing the finding significance to Green, very low safety significance.

NRC in-office review of the information indicated that this was not a feasible approach to filling these positions for the following reasons:

- This approach would result in assigning multiple tasks to individuals which, in a number of cases, would be burdensome. For example, if an off-hours Alert was declared, the onshift RP technician would be required to assume the temporary position of Radiological Controls Coordinator to coordinate all RP actions, as well as perform initial dose assessment, and be available for in-plant protective actions and offsite surveys. This would potentially overburden the technician to the extent that he could not perform all of these tasks.
- Some of the responders who would be assigned, in an impromptu manner, to perform RP functions, are not presently in EPP-required positions, and therefore may not be available in all situations. This is true of one plant operator on each unit, one RP technician, and four maintenance technicians.
- Although First Energy stated that many of their staff are “meter qualified” to perform basic RP duties, the staff noted that this level of training would not be sufficient to carry out the complex RP duties that would be necessary in a radiological emergency. For example:
  - The training provided does not prepare operators to provide RP coverage for other licensee personnel.
  - Potential dangers such as hazardous atmospheres were not considered in the training.
  - Radiation protection is not incorporated into the normal job of an operator.
  - There is heavy reliance on the RP department when plant events have significant radiological consequences.

- Licensee Event Reports indicated that operators have demonstrated an inability to provide self-coverage, without the additional burden of coverage for others required in an emergency.
- The licensee stated that the Shift Manager could, in an ad hoc manner, effectively coordinate the activities of available personnel, absent the additional RP technicians, to handle all contingencies encountered during an emergency. The staff noted that this would be a difficult task during the early stages of an emergency when the Shift Manager has all responsibility for event management. Additionally, this would defeat the very purpose of shift augmentation, which is to unburden the shift crew so they can focus on stabilizing the reactor plant.

For these reasons, the staff concluded that the approach outlined in the additional information did not provide a viable substitute for the 12 additional RP technicians which are required by the EPP in an emergency, and therefore, did not mitigate the significance of the finding.

#### Enforcement

First Energy's failure to ensure the timely augmentation of emergency response capabilities is an apparent violation of 10 CFR 50.47(b)(2) which states, in part, "...adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available...." The licensee's EPP, Table 5-1, requires that 12 RP technicians must respond in 30 or 60 minutes to cover the four functions of offsite surveys, onsite surveys, in-plant surveys, and in-plant protective actions. The existing call-out process was manual, by telephone, resulting in the response delays noted in the 1/31/03 activation test and First Energy had not tested the capability to augment shift staff with the 12 RP technician responders before that test. **(AV 50-334,412/03-006-01)**

The inspector determined that there was no immediate safety concern from this issue due the licensee's interim compensatory measures. Specifically, the RP technicians were added to the automated call-out system and 16 supervisory personnel with RP expertise and travel times of less than 50 minutes were identified to fill the augmented RP positions until the arrival of a sufficient number of RP technicians. The licensee documented the issue in CR 03-02202 as a significant condition adverse to quality, and intended to perform a root cause analysis to prevent recurrence.

#### 1EP4 Emergency Action Level (EAL) and Emergency Plan Changes

##### a. Inspection Scope

The inspector reviewed recent EPP and implementing procedure changes to determine if the changes resulted in a decrease in the effectiveness of the EPP. He also reviewed the licensee's 10 CFR 50.54(q) review process used for EPP changes to assess its adequacy in determining if EPP changes reduced the Plan's effectiveness. Lastly, the inspector observed activities and reviewed documentation associated with an actual Notification of Unusual Event which occurred on 2/24/03 while the inspector was onsite,

to assess the licensee's use of the EAL scheme for classifying the event and use of implementing procedures for notification of State and local authorities, and the NRC.

The inspector conducted the review in accordance with NRC Inspection Procedure 71114, Attachment 04. The applicable requirements in 10 CFR 50.54(q), 10 CFR 50.47(b), and 10 CFR 50, Appendix E were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector reviewed the 2/25/02 Emergency Preparedness Audit, and EP self-assessments on the Alert and Notification System (February, 2003), EPP Implementation (August 2002), and ERO Augmentation (June, 2001). He also reviewed CRs written to document weaknesses and deficiencies identified during the audit and self-assessments to verify that issues were being corrected in a timely manner. Additionally, the inspector reviewed other CRs assigned to the EP department to determine the significance of issues being identified, if repeat problems were occurring, and that all issues were being corrected. The inspector focused his review on the following three CRs:

- 01-7356 Results of 11/5/01 ERO beeper test.
- 02-02195 EPP change resulting in a decrease in the effectiveness of Plan.
- 02-05549 EPP 15-minute initial notifications not being met.

The inspector conducted these reviews in accordance with Inspection Procedure 71114, Attachment 05. The applicable planning standard, 10 CFR 50.47(b)(14), and the requirements in 10 CFR Appendix E, Section IV.F.2.g, were used as reference criteria.

b. Findings

No findings of significance were identified.

## SUPPLEMENTAL INSPECTION

### **01 INSPECTION SCOPE**

The NRC performed this supplemental inspection to assess First Energy's evaluation associated with the inadequate maintenance and testing of the personal home alerting devices (PHADs), an integral part of the alert and notification system. This performance issue was previously characterized as "White" in NRC Inspection Report number 50-334,412/02-03 and is related to the emergency preparedness cornerstone in the reactor safety strategic performance area.

### **02. EVALUATION OF INSPECTION REQUIREMENTS**

#### 02.01 Problem Identification

- a. Determination of who (i.e., licensee, self-revealing, or NRC) identified the issue and under what conditions.

The 1998 Quality Assurance (QA) audit of EP identified that there was no formal procedure for PHAD maintenance and testing, which was documented in Condition Report (CR) 98-0481. The EP department agreed to a corrective action (CA) to correct this deficiency, but this CA was closed to another CR concerning the 1999 siren system update. The March, 2001 QA audit identified that the corrective actions had never been completed. The licensee subsequently revised procedure EP-7, "Alert Notification System Maintenance and Testing," but the August 2001 NRC EP program review identified that there was still no approved test procedure, and no defined acceptance criteria to assess operability of the 1200 PHADs, which are an integral part of the alert and notification system (ANS). Additionally, there was no testing documentation to verify PHAD operability. Therefore, the NRC determined that the failure to test and maintain the PHADs constituted a failure to meet Planning Standard 50.47(b)(5).

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

The inspector noted that this issue existed since the original ANS approval by the Federal Emergency Management Agency in December 1985. Prior opportunities to identify and correct this issue were the 1998 and 2001 QA audit findings. However, since neither the QA or EP groups recognized fully that the PHADs were integral to the ANS, a system required by the EPP for notification of the public, no immediate corrective actions were taken, and CRs written to correct the issue were of low significance.

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

The means to alert and notify the public in a timely manner is a Risk Significant Planning Standard (RSPS), and according to the EP Significant Determination Process (SDP), the failure to meet this RSPS is considered a finding of substantial safety significance (Yellow). However, the EP SDP recognizes that a finding placed in context through the

SDP can result in a color that exceeds the actual impact on public health and safety. First Energy did not meet the requirements of the RSPS set forth in 10 CFR 50.47(b)(5) because a majority of the PHADs were degraded or removed, and this reflected a degradation of the means for early notification of the public in the entire emergency planning zone (EPZ). Nonetheless, in the event of a radiological emergency, the majority of the public would be notified directly by the ANS, which includes the sirens and the functional PHADs. The populace not covered by the sirens and functional PHADs would likely be informed via “informal alerting” by such means as television, radio, or “word-of-mouth.”

Therefore, the NRC determined that the condition of the ANS due to degraded and removed PHADs did not have a substantial impact on the EP Cornerstone Performance Expectation, and the finding was more appropriately characterized as low to moderate safety significance (White).

#### 02.02 Root Cause and Extent of Condition Evaluation

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

To evaluate this issue, First Energy used the methodologies of Human Performance Enhancement System causal analysis, document review, and personnel interviews. The inspector determined that the licensee followed its procedural guidance for performing a root cause analysis for a significant condition adverse to quality. The investigation was performed by a cross-disciplinary three-person team whose members had received formal root cause analysis training.

##### b. Level of detail of the root cause evaluation.

The licensee’s root cause evaluation was thorough and identified a primary root cause and five contributing causes. The root cause was the failure to administratively ensure that PHAD test procedures, acceptance criteria, maintenance programs and installation data were properly established and maintained. The contributing causes included: (1) Self-checking was not applied to ensure the intended actions (i.e., PHAD testing and maintenance) were correct; (2) Inadequate implementation of corrective actions; (3) Response to a known or repetitive problem was untimely; (4) Management follow-up or monitoring of activities did not identify problems; and (5) Personnel exhibited insufficient awareness of the impact of actions on safety.

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

First Energy’s evaluation included an experience review to determine if similar problems had been identified at BVPS, or the nuclear industry in general. The only occurrences at BVPS were the QA audit findings concerning PHAD testing and maintenance previously discussed. Other utilities that used supplemental alerting methods were all found to utilize tone alert radios. No other sites were found that used modulated power line devices like PHADs.

- d. Consideration of potential common causes and extent of condition of the problem.

First Energy's extent of condition review for this issue was not of sufficient scope and focused on EP issues alone. For example, the investigation included a self-assessment of EPP implementation only. The EP manager stated that the EP group was the only one with "offsite" systems like the ANS, and thus concluded that a more broad assessment was not necessary. Also, a detailed review of existing corrective actions, to ensure that there were no other issues affecting license conditions which may require interim compensatory measures, was confined to the EP area only. The investigation did not expand to other disciplines where there could be issues similar to the inadequate testing and maintenance of the PHADs, in that commitments made were not properly translated into implementation documents such as operating or test procedures such as in the case for equipment used as a part of security and fire protection plan implementation.

First Energy management acknowledged this concern and wrote a new CA (#24) to CR 02-02202 which directed the regulatory affairs group to develop a plan to further evaluate the extent of condition of this issue. The licensee subsequently provided the new extent of condition evaluation to the NRC for review (Attachment 3). The NRC determined that this extent of condition was of sufficient scope and found no additional issues which would prevent closure of the PHAD issue.

### 02.03 Corrective Actions

- a. Determination that appropriate corrective actions are specified for each root/contributing cause.

First Energy established immediate and long term corrective actions to address the root cause and contributing causes for this issue. Because the PHAD system was old and would require a major renovation for continued usage, licensee management decided to replace the PHADs with six new sirens in Beaver County, PA. Additionally, one siren was added in St. Clair Township, Columbiana County, OH, in a high growth area, and three original sirens in Beaver County were replaced. All siren additions and replacements were with the Federal Signal Model 2001 AC siren, which is rated at a higher sound level output than the present ones in use. While the ANS modifications were in progress and until the EPP is revised to remove the PHADs, the licensee arranged with Beaver County to provide immediate route alerting for notification of the public in an emergency.

The licensee addressed the human performance issues associated with this issue by reviewing the root cause analysis report with the QA and EP staffs, reviewing the ANS basis document with the EP staff to increase their knowledge of the system, and requiring the EP staff to attend human performance training.

The inspector determined that the CA implemented for contributing cause #2 (inadequate implementation of corrective actions) was too narrow in scope. This CA was designed to prevent recurrence of CAs being closed with no action taken, such as the 1998 QA finding concerning PHAD testing and documentation. The proposed CA



focused solely on the PHAD issue and didn't account for the fact that the same issue could occur in other disciplines.

In response to this concern, the EP manager explained that the CR process had been revised to prevent recurrence of this type of issue. For example, all CRs now receive management review whereas they did not previously, the new process establishes thresholds which would identify the PHAD issue as a more significant issue, i.e., a condition adverse to quality with a more detailed investigation for resolution, and new checks were added to prevent premature CA closure without proper action. The licensee changed the root cause report to document that these changes to the CR process addressed contributing cause #2.

The inspector concluded that the proposed CAs, in concert with the CR process procedure changes, were appropriate.

- b. Determination that the corrective actions have been prioritized with consideration of the risk significance and regulatory compliance.

The inspector determined that immediate and long term corrective actions were appropriately prioritized and given reasonable due dates to restore regulatory compliance. Interim compensatory measures, i.e., immediate route alerting, ensured that the public would be notified of an emergency while First Energy completed the ANS modifications.

- c. Determination that a schedule has been established for implementing and completing the corrective actions.

The inspector determined that the licensee's schedule for implementing and completing the corrective actions was adequate.

- d. Determination that quantitative or qualitative measures of success have been developed for determining the effectiveness of the corrective actions to prevent recurrence.

The inspector concluded that the effectiveness review for CAs taken on the PHAD issue focused solely on the siren additions and replacements and did not appropriately address the human performance issues which contributed to inadequate PHAD testing and maintenance. The EP manager stated that her staff would address the human performance issues in the effectiveness review before it was reviewed by the corrective action review board (CARB).

The updated effectiveness review was reviewed and accepted by CARB on March 5, 2003. The licensee also submitted the review to the NRC for evaluation subsequent to the inspection (Attachment 3). The NRC determined that this review adequately addressed the human performance issues associated with the PHAD White finding.

**03. MANAGEMENT MEETINGS****Exit Meeting Summary**

The inspector presented the inspection results to Mr. Mark Bezilla, Site Vice President, and other members of licensee management, on February 28, 2003, at the conclusion of the inspection. The licensee acknowledged the findings presented.

On March 26, 2003, the inspector informed the licensee via telephone that the NRC wanted to review an additional extent of condition investigation and the updated corrective action effectiveness review concerning the PHAD White issue. The licensee acknowledged this and the management stated that they would provide the requested information when it was complete.

First Energy provided the requested information which the NRC reviewed between April 17-29, 2003. On April 30, 2003, the inspector informed the licensee via telephone that the information adequately addressed NRC questions concerning the closure of the White finding for the PHAD issue.

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

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Beaver Valley Power Station:

M. Bezilla, Site Vice President  
J. Lash, Plant Manager  
M. Pearson, Director, Site Services  
B. Sepelak, Supervisor, Regulatory Affairs  
S. Vicinie, EP Manager

#### Nuclear Regulatory Commission

R. Conte, Chief, Operational Safety Branch  
G. Smith, Resident Inspector

#### State Agencies

L. Ryan, PA Bureau of Radiation Protection  
R. Sacchet, Ohio Emergency Management Agency

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

#### Opened:

05000334,412/03-006-01	AV	Adequate and timely emergency response staffing in four key functional areas not maintained at all times. (Section 1EP3)
------------------------	----	--

#### Closed:

05000334,412/02-003-01	VIO	Failure to adequately test or maintain the sirens (PHADs) to meet the original design basis of the ANS.
------------------------	-----	---

#### Discussed:

None

**LIST OF DOCUMENTS REVIEWED**

- 1) Beaver Valley Power Station Emergency Preparedness Plan
- 2) First Energy Nuclear Operating Company Alert and Notification System Update/Modification (8/15/02)
- 3) BVPS ANS Modification Project Summary of Siren Sound Level Testing (10/22/02)
- 4) BVPS Emergency Notification Testing, Review and Trending, Rev 0, 12/18/02
- 5) Emergency Preparedness Section Personnel Training Requirements, BVBP-EPP-0001, (2/25/03)
- 6) NOP-LP-2001, Condition Report Process
- 7) Beaver Valley Condition Report Reference Guide For NOP-LP-2001, Rev 10, 1/23/03
- 8) CARB Meeting 02-19 Minutes (5/21/02)
- 9) Emergency Preparedness Master Assessment Plan
- 10) Condition Report 02-02202, Preliminary Yellow Finding for failure to meet 10 CFR 50.47(b)(5) and 10 CFR 50 Appendix E, Section IV.D.3 for the ANS

**LIST OF ACRONYMS**

ANS	Alert Notification System
CA	Corrective Action
CARB	Corrective Action Review Board
CFR	Code of Federal Regulations
CR	Condition Report
EP	Emergency Preparedness
EPP	Emergency Preparedness Plan
ERO	Emergency Response Organization
NRC	Nuclear Regulatory Commission
PHADs	Personal Home Alerting Devices
QA	Quality Assurance
RP	Radiation Protection
RSPS	Risk Significant Planning Standard
SDP	Significance Determination Process

## Attachment #2

### Beaver Valley's Staffing to Meet the Requirements of Table 5.1 Functions

During the NRC Inspection performed at Beaver Valley the week of Feb 24, 2003, the issue of augmentation of the ERO was raised. In January 2003, Beaver Valley performed an unannounced augmentation resulting in failure to have 12 additional Radiation Protection Technicians on site within 60 minutes. This was the first such drill that included participation by the Radiation Protection Technicians.. Following this drill, a Condition Report was initiated and immediate corrective actions were taken.

As in interim compensatory measure, management personnel, qualified in Radiation Protection and NOT holding a 60 minute response position, were identified and notified that in the event of a declared emergency requiring the activation of emergency facilities, they were to respond to the Operations Support Center to perform the functions of the Radiation Protection Technicians until the represented technicians arrived. Additionally, the technicians home phone numbers were entered into our computerized call out system (BVERS) so that the technicians would receive the call in a more timely manner. Technician addresses were verified to support the need to arrive within 60 minutes.

Unit One is currently in a Refueling outage and has sufficient numbers of Radiation Protection personnel on site 24 hours a day to support emergency staffing levels. Discussions with representatives of the union were held and the Radiation Protection Technicians will be provided with cell phones and pagers to ensure their ability to respond within the required 60 minutes. These will be distributed prior to the end of outage staffing.

The remaining question involved the site's ability to perform the functions identified in Table 5.1 of our Emergency Plan PRIOR to these corrective actions. A review of past facility activations was performed. Alerts were declared in 1988 and 1990 and in each case, although rosters are not available, the event report indicates that the ROC and OSC (facilities to which the Radiation Protection Technicians would have reported) were staffed in a timely manner. Likewise, although staffing was not required for Unusual Events declared in 2000 and 2001, the event reports indicate no staffing deficiencies. An Unusual Event occurred on the February 24, 2003 (the first day of the Inspection) and although the event was declared after quitting time for the Radiation Protection Technicians, the requirement to augment the ERO with 12 additional technicians within one hour was met. A review of site staffing and the table was performed and is provided on the following pages. The table identifies the minimum site staffing and which functions each of the personnel could provide. *This evaluation demonstrates that we would have been capable of performing all these functions with the minimum site staffing.* This is due in large part to the significant number of personnel on each shift who are meter qualified (18).

On-shift staffing has been verified to include:

- 2 Shift Managers (one at each unit) – meter qualified
- 2 Unit Supervisors (one at each unit) – meter qualified
- 4 Reactor Operators (two at each unit) – meter qualified
- 6 Plant Operators (3 at each unit) – meter qualified
- 1 STA (covers both units)
- 1 Chemistry Technician
- 3 HP (Rad Pro) technicians
- security personnel (number not available – but verified to meet plan requirements)
- 2 Mechanical Maintenance Technicians
- 2 Electrical Maintenance Technicians
- 2 Instrument and Control technicians

## Attachment #2

There are 34 tasks identified in Table 5.1 that Beaver Valley Power Station for which Beaver Valley relies upon either on-shift or call in personnel, . The chart below identifies which of the individuals on-shift could perform the function should the call -out Radiation Protection Technicians not have arrived on site with in the 60 minutes.

Job Title	Abbreviation used in following chart	Function Available to perform during Emergencies	Tasks Performed
*Affected Unit Shift Manager	AUSM	Nuclear Shift Supervisor	Task 1 Task 8
*Affected Unit Shift Supervisor	AUSS	Assistant Shift Supervisor	Task 2
*Affected Unit Reactor Operator	AURO1	Reactor Operator	Task 3
*Affected Unit Reactor Operator	AURO2	Reactor Operator	Task 4
*Affected Unit Plant Operator	AUPO1	Nuclear Operator	Task 5
*Affected Unit Plant Operator	AUPO2	Nuclear Operator	Task 6, Task 18
*Affected Unit Plant Operator	AUPO3	In-Plant Protective Actions	Task 29
*Unaffected Unit Shift Manager	UUSM		
*Unaffected Unit Shift Supervisor	UUSS	Rescue Operations and First Aid, In-plant Protective Actions	Task 33▲, Task 31
*Unaffected Unit Reactor Operator	UURO1		
*Unaffected Unit Reactor Operator	UURO2	In-Plant protective Actions	Task 32
*Unaffected Unit Plant Operator	UUPO1	OffSite Surveys	Task 12
*Unaffected Unit Plant Operator	UUPO2	OnSite Surveys	Task 14
*Unaffected Unit Plant Operator	UUPO3	In-Plant Surveys, Rescue Operations and First Aid	Task 16, Task 34▲
*Shift Technical Advisor	STA	Shift Technical Advisor	Task 7, Task 20
Chemistry Technician	CT	Chemistry	Task 19 (back-up for task9)
Mechanical Maintenance Technician	MM1	Repair/Corrective Actions	Task 22
Mechanical Maintenance Technician	MM2	Off Site Surveys (driver)	Task 13, Task 21▲
Electrical Maintenance Technician	EM1	Repair/Corrective Actions	Task 24
Electrical Maintenance Technician	EM2	Repair/Corrective Actions	Task 26
Instrument and Control Technician	IC1	Off-site surveys(driver)	Task 11, Task 23▲
Instrument and Control Technician	IC2	Repair/ Corrective Actions	Task 25
*Rad Pro Technician	RP1	Off-site Surveys	Task 10
*Rad Pro Technician	RP2	On Site Surveys	Task 15
*Rad Pro Technician	RP3	In-Plant Protective Actions	Task 27▲, Task 17
Security Officer	SO1	Communications	Task 9
Security Officer	SO2	Assist with Access Control Portion of In-Plant Protective Actions	Task 28▲
Security Officer	SO3	Assist with Access Control Portion of	Task 30

Attachment #2

		In-Plant Protective Actions	
--	--	-----------------------------	--

\*Indicates personnel who are meter qualified.

▲Indicates a function that Table 5.1 indicates may be provided by personnel assigned other functions.

The Staffing levels ensure a minimum of 28 individuals to perform these 34 functions.

The availability of the 3 Security Officers has been verified with the Security Manager as being in excess of the number required for minimum Security Staffing.

Attachment #2

Table 5.1 of the Emergency Plan delineate the functions that our staffing must support. The following table describes how the functions required in Table 5.1 would have been met through the staffing levels that were maintained on-site.

Major Functional Areas	Major Tasks	Position/Title/Expertise	On-Shift Requirements	30 minute additions	60 minute additions
Plant Operations and Assessment of Operational Aspects		Nuclear Shift Supervisor	1 AUSM  TASK 1	0	0
		Assistant Nuclear Shift Supervisor	1 AUSS TASK 2	0	0
		Reactor Operator	2 AURO1 AURO2 TASK 3, 4	0	0
		Nuclear Operator	2 AUP01 AUP02 TASK 5,6	0	0
		Shift Technical Advisor	1 STA TASK7	0	0
Emergency Control And Direction		Nuclear Shift Supervisor or Designated Emergency Response Facility Manager	1 AUSM  Task 8	0	0



Attachment #2

Major Functional Areas	Major Tasks	Position/Title/Expertise	On-Shift Requirements	30 minute additions	60 minute additions
Notification/Communication	Notify Licensee, State, Local and Federal Personnel and Maintain Communication	NSS Admin Asst. or designated Communicators	1 SO1 (with CT as back-up)  Task 9	1 Communications and Records Coordinator on a pager and tested	2 Communications and Records Coordinator Assistants - on a pager and tested
Radiological Accident Assessment	Off Site Dose Assessment	Sr. HP expertise - EA&DP Coordinator	0	1 EA&DP Coordinator - on a pager and tested	0
	Off Site Surveys	HP Technicians	0	2 RP1 IC1  Task 10, 11	2 UUP01 MM2  Task 12, 13
	On Site Surveys (out of plant)	HP Technicians	0	1 UUP02 Task 14	1 RP2 Task 15
	In Plant Surveys	HP Technicians	1 UUP03 Task 16	1 RP3 Task 17	1 AUP02 Task 18
	Chemistry/Radiochemistry	Chemistry	1 CT Task 19	0	1 TSC Chemistry Coordinator - on a pager and tested

Attachment #2

Major Functional Areas	Major Tasks	Position/Title/Expertise	On-Shift Requirements	30 minute additions	60 minute additions
Support of Operational Accident Assessment	EOF Director	Emergency Recovery Manager	0	0	1 Emergency Recovery Manager on a pager and tested
Plant System Engineering	Technical Support	Shift technical Advisor	1 STA Task 20	0	0
		Core/Thermal Hydraulics	0	1 Nuclear Engineer - On a pager and tested	0
		Electrical	0	0	1 Electrical Engineer - on a pager and tested
		Mechanical	0	0	1 Mechanical Engineer - On a pager and tested
Repair and Corrective Actions	Repair and Corrective Actions	Mechanical Maintenance/Rad Waste Operator	1** MM2 Task 21	0	1 MM1 Task 22
		Electrical Maintenance/Instrument and Control	1** IC1 Task 23 0	1 EM1 Task 24 1 EM2 Task 26	1 IC2 Task 25 0

Attachment #2

Major Functional Areas	Major Tasks	Position/Title/Expertise	On-Shift Requirements	30 minute additions	60 minute additions
Protective Actions (In-Plant)	Radiation Protection -Access Control -HP Coverage -Personnel Monitoring -Dosimetry	HP Technicians	2* RP3 SO2  Task 27, 28	2 AUPO3 SO3  Task 29, 30	2 UUSS UURO2  Task 31, 32
Firefighting		Fire brigade	0	0	0
Rescue Operations and First Aid		Per T.S.	2* UUSS Task 33 UUPO3 Task 34	0	0
Site Access Control and Personnel Accountability	Security Personnel Accountability	Security Personnel	Per Security Plan	Per Security Plan	Per Security Plan

\* this function may be provided by shift personnel assigned other functions..