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December 3, 2004  
L-04-152

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555-0001

**Subject: Beaver Valley Power Station, Unit No. 1 and No. 2  
BV-1 Docket No. 50-334, License No. DPR-66  
BV-2 Docket No. 50-412, License No. NPF-73  
Response to Request for Additional Information in Support of LAR  
Nos. 306 and 176 Emergency Diesel Generator Allowed Outage  
Time Extension**

This letter provides the FirstEnergy Nuclear Operating Company (FENOC) response to an NRC request for additional information (RAI) dated October 20, 2004, relating to FENOC letter L-04-072 dated May 26, 2004.

FENOC letter L-04-072 submitted License Amendment Request (LAR) Nos. 306 and 176 for Beaver Valley Power Station (BVPS) Units No. 1 and 2, respectively. These amendment requests proposed changes to the BVPS Unit No. 1 and 2 Technical Specifications which would extend the current Emergency Diesel Generator (EDG) allowed outage time to 14 days, remove the surveillance requirement for performing EDG maintenance inspections from the Technical Specifications, and revise the EDG Technical Specification requirements for restoring EDG fuel oil properties to within limits.

The FENOC response to the request for additional information is provided in Attachment A of this letter. Attachment B of this letter provides a description of the BVPS Risk Management Program expectations by risk category. Attachment C provides a list of regulatory commitments made in this submittal.


This information does not change the evaluations or conclusions of the No Significant Hazards Consideration presented in FENOC letter L-04-072. If there are any questions concerning this matter, please contact Mr. Henry L. Hegrat, Supervisor - Licensing, at 330-315-6944.

ADD 1

Beaver Valley Power Station, Unit No. 1 and No. 2  
Response to RAI in Support of LAR Nos. 306 and 176  
Emergency Diesel Generator Allowed Outage Time Extension  
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I declare under penalty of perjury that the foregoing is true and correct. Executed on  
December 3, 2004.

Sincerely,



L. William Pearce

Attachments:

- A. Responses to Request for Additional Information Related to BVPS-1 and 2 EDG Allowed Outage Time
  - B. BVPS Risk Management Program Expectations by Risk Category
  - C. List of Regulatory Commitments
- 
- c: Mr. T. G. Colburn, NRR Senior Project Manager
  - Mr. P. C. Cataldo, NRC Sr. Resident Inspector
  - Mr. S. J. Collins, NRC Region I Administrator
  - Mr. D. A. Allard, Director BRP/DEP
  - Mr. L. E. Ryan (BRP/DEP)

**Attachment A**  
**Letter L-04-152**

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION  
RELATED TO FIRSTENERGY NUCLEAR OPERATING COMPANY  
BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2  
EMERGENCY DIESEL GENERATOR ALLOWED OUTAGE TIME  
DOCKET NOS. 50-334 AND 50-412

By letter dated May 26, 2004, First Energy, LLC (the licensee) proposed changes to Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2) Technical Specifications. The proposed change would extend allowed outage time (AOT) for emergency diesel generator (EDG) from 72 hours to 14 days to restore an inoperable EDG to operable status. In order for the staff to proceed with its review of the proposed change, the following information is needed.

1. Discuss and provide information on the reliability and availability of offsite power sources. The discussion should include the duration, cause(s), date and time of each loss-of-offsite power (partial or complete) event.

**Response:**

Information related to the reliability and availability of the BVPS offsite power sources was previously submitted to the NRC as part of the response to a request for additional information dated September 24, 2004 for the proposed EDG AOT change. Attachment A, Item 12, of FENOC Letter L-04-141 "Beaver Valley Power Station, Unit No. 1 and No. 2 Response to Request for Additional Information in Support of LAR Nos. 306 and 176 Emergency Diesel Generator Allowed Outage Time Extension" dated October 29, 2004, provides information related to the reliability and availability of the BVPS offsite power sources. Based on subsequent communications with NRC staff, this information appears to adequately address this request.

2. Discuss the compensatory measures that will ensure the availability of the remaining sources of power to minimize the occurrence of a station blackout and ensure compliance with the requirements of General Design Criteria 17 and 18 of Appendix A to 10 CFR Part 50, when the EDG is removed from service.

**Response:**

The BVPS onsite emergency power systems are designed in accordance with General Design Criterion 17 of 10 CFR 50, Appendix A, and have sufficient independence and redundancy to perform their safety functions assuming a single failure. Each BVPS unit includes two separate and independent EDGs to ensure that at least one onsite AC power source will be available to supply power to its associated class 1E 4KV emergency bus during accident

conditions, coincident with a loss of offsite power and failure of the alternate train EDG for that unit. The risk associated with extending the EDG AOT from 72-hours to 14-days is considered to be acceptable based on Regulatory Guide 1.177, and the system design basis and compliance with General Design Criteria 17 and 18 of Appendix A to 10 CFR 50 are maintained. Should the redundant EDG become inoperable while in the extended AOT for one EDG, Technical Specification 3.8.1.1 requires that one of the inoperable EDGs be returned to service within two hours or a plant shutdown be initiated.

Enclosure pages 21 through 23 of the BVPS License Amendment Request for the EDG AOT change provides a discussion of compensatory measures that will be taken to ensure the availability of the remaining power sources during the time the EDG is removed from service. The compensatory measures are also listed as NRC commitments in Attachment C of the submittal. These compensatory measures describe the restrictions that will be used to ensure the availability of the offsite power sources and SBO alternate AC power.

In addition to the compensatory measures taken to ensure the availability of the remaining sources of power identified above, the BVPS on-line configuration risk management program governed by 10CFR50.65 (a)(4) evaluates the risk impact for scheduled activities as part of the on-line maintenance 12-week schedule process. This includes assessing the risk associated with scheduled EDG and other SSC unavailability and taking the necessary compensatory actions commensurate with the risk impact, as provided in BVPS procedure 1/2-ADM-2033 "Risk Management Program" (BVPS Risk Management Program expectations by risk category are provided in Attachment B), to minimize the consequences.

#### **ADDITIONAL INFORMATION:**

During the discussion with the NRC staff on the information requested in this RAI, it was also requested that information be provided concerning what plant configurations would not be allowed by the BVPS configuration risk management program, and what restrictions would be placed on the steam-driven auxiliary feedwater pump maintenance during the time that an EDG is out-of-service.

The current on-line configuration risk management program is controlled by BVPS procedure 1/2-ADM-0804, "On-Line Work Management and Risk Assessment". This procedure dictates that a risk level of  $\geq 1.0E-03$  ("RED RISK" condition) shall not be entered for planned maintenance, in accordance with NUMARC 93-01 Section 11 guidance. This procedure also stipulates that, although less risk significant systems may be worked concurrently with one or two risk significant systems, the number of systems or components which are concurrently taken out of service should be minimized. Applying this practice limits the number of planned plant configurations that would result in a prohibited "RED RISK" condition.

All such conditions are too numerous to account for in this response. However, examples of configurations at each unit that would result in a "GREEN RISK" condition with one EDG unavailable, being elevated to a prohibited "RED RISK" condition, include the following:

### Unit 1

EE-EG-1 (1AE emergency bus EDG) and 4KVS-1A-1A10 (Normal 4KV bus supply breaker to 1AE bus)

EE-EG-1 (1AE emergency bus EDG), 4KVS-1A (Normal 4KV bus supply to 1AE bus), and 1FW-P-4 (Dedicated Auxiliary Feedwater Pump)

### Unit 2

2EGS-EG2-1 (2AE emergency bus EDG) and 4KVS-2A (Normal 4KV bus supply to 2AE bus)

2EGS-EG2-2 (2DF emergency bus EDG) and BAT-2-6 (Normal 125V DC bus for offsite power breaker control to 4KVS-2D)

System specific guidance is also provided in the on-line configuration risk management procedure to preclude SSC combinations leading to elevated plant risk conditions (e.g., YELLOW or ORANGE RISK) based upon good station operating practices. Examples of these restrictions include:

- The steam (turbine)-driven auxiliary feedwater pump will not be removed from service if either emergency diesel generator is out-of-service.
- The steam-driven auxiliary feedwater pump will not be removed from service if only one high head safety injection (HHSI)/Charging pump is operable.
- Only one auxiliary feedwater pump or the dedicated auxiliary feedwater pump (Unit 1 only) may be removed from service at a time.
- Only one atmospheric steam dump valve or the Residual Heat Release valve will be removed from service at a time. These valves are used to cool the plant down in an SBO condition.
- The Auxiliary Intake Structure Bays will not be removed from service, [i.e., both Auxiliary River Water Pumps (at Unit 1), or both Standby Service Water Pumps (at Unit 2)], if the spare river water (service water) pump is out-of-service. This ensures that at least three river/service water pumps are available to each unit.
- At least one fuel pool purification pump should be maintained available, if possible, to maintain Refueling Water Storage Tank (RWST) volume. These pumps are required to provide makeup to the RWST from the Spent Fuel Pool.

Furthermore, configurations that are prohibited by the EDG AOT Extension LAR Submittal Commitments (Attachment C of the submittal and those made as part of the response to this RAI) or by the Technical Specification 3.0.5 (see response to RAI question 5.D) would not be intentionally planned as part of the on-line maintenance 12-week schedule process. However, if emergent conditions were to develop with an EDG either unavailable or scheduled to be removed from service, the following provisions would be taken, in accordance with 1/2-ADM-0804:

- If an SSC in the outage train becomes inoperable because of equipment failure, before or after removal from service, scheduled activities may continue provided the resultant plant risk level is acceptable. A qualitative assessment may be made; however, a PRA evaluation should also be completed as soon as possible thereafter to evaluate the specific configuration and its potential impact on scheduled maintenance.
  - If a system or component in the protected train fails prior to the scheduled removal of an SSC in the outage train, scheduled equipment outages in the outage train shall be deferred until a PRA analysis has determined that the resultant plant risk does not exceed allowable risk level increases.
  - If emergent work results in components in the protected train being out of service concurrent with scheduled work in the outage train (e.g., a Train A component is out of service for maintenance and a Train B component in a different system becomes inoperable due to failure), the responsible work group should expedite restoration of the equipment that can most readily be returned to service. A separate PRA calculation shall establish an acceptable level of overall plant risk before a decision is made to remain in a plant configuration which involves concurrent inoperability of risk significant systems or components in both trains.
3. Discuss what, if any, contingency plans will be developed to restore the inoperable EDG in the event of unanticipated adverse weather or degraded grid conditions occurring which can significantly increase the probability of losing offsite electrical power.

**Response:**

If unanticipated severe weather conditions or degraded grid conditions should occur which impact the station switchyard or the electrical grid in the vicinity of BVPS during the time an EDG is out of service, station management would initiate the appropriate actions to expedite the restoration of the EDG. These actions would include suspension of the planned maintenance, providing the required dedicated resources on each shift to restore the EDG as soon as possible and soliciting vendor support as required to expedite the return to service. Based on past maintenance experience, it is estimated that if an EDG was disassembled for a major overhaul it would take approximate two to three days to return a Unit 1 EDG to service. Due to differences in the design of the Unit 2 EDGs, it is estimated that it would take approximate three to four days to return a Unit 2 EDG to service.

4. Describe the communication protocol that has been established between the control room operator at Beaver Valley Power Station and the System Load Dispatcher with respect to the subject amendments request. Is the System Load Dispatcher notified in advance that the EDG is going to be out for extended period of time?

**Response:**

BVPS will implement the following communication requirements between BVPS and the System Control Centers when entering the 14 day EDG AOT:

Prior to removing an EDG from service for scheduled maintenance and within 24 hours after removing an EDG for unscheduled maintenance, BVPS will contact the FirstEnergy and Duquesne Light Company System Control Centers to inform them of the planned/current EDG outage, schedule for restoration and the power needs of the station.

5. Other licensees who have requested for EDG AOT extension provided the following Regulatory Commitments in their requests. Please address these commitments as they relate to the BVPS-1 and 2 application.
  - A. The condition of the off-site power supply and switchyard will be evaluated prior to entering the extended AOT. Please address what compensatory measures will be taken consistent with the Regulatory Guide 1.177.

**Response:**

BVPS Regulatory Commitment No. 3 included in Attachment C of the EDG AOT Extension License Amendments Request includes the following commitment for entering the 14 day EDG AOT for scheduled maintenance:

Prior to removing the EDG from service, the stability of the offsite power system in the vicinity of BVPS will be verified by contacting the FirstEnergy and Duquesne Light Company System Control Centers to determine the projected load demand and status of the grid during the period the EDG will be unavailable.

- B. The steam-driven emergency feedwater pump will not be taken out of service for planned maintenance activities and will be treated as protected equipment.

**Response:**

The BVPS administrative procedures for implementing Section (a)(4) of the Maintenance Rule will be revised to reflect the following restrictions for entering the 14 day EDG AOT:

An EDG will not be removed from service for planned on-line maintenance if the associated unit's steam driven auxiliary feedwater pump is out of service; and while in the EDG AOT, the steam driven auxiliary feedwater pump will not be removed from service for any planned maintenance.

- C. The system dispatcher will be contacted once per day and informed of the EDG status along with the power needs of the facility.

**Response:**

The communications that will be required with the system control centers when an EDG is removed from service are described above in response to RAI item 4. The system control centers would not typically be contacted following the initial notification that an

EDG is being removed from service unless the duration of the planned activities has changed.

- D. No maintenance or testing that affects the reliability of the train associated with the OPERABLE EDG will be scheduled during the extended AOT. If any testing and maintenance activities must be performed while the extended AOT is in effect, a 10 CFR 50.65 (a)(4) evaluation will be performed.

**Response:**

BVPS uses the protected train concept when scheduling on-line maintenance, testing or surveillances. Should an emergent condition arise which results in a component in the protected train being out of service concurrent with scheduled work in the outage train, the On-Line Risk Management Program would require actions be initiated to expedite restoration of the equipment that can most readily be returned to service. A risk evaluation must be performed to establish an acceptable level of overall plant risk before a decision is made to remain in a plant configuration which involves concurrent inoperability of risk significant systems or components in both trains.

In addition, BVPS Unit 1 and Unit 2 Technical Specifications (TS) Specification 3.0.5 provides restrictions concerning train equipment associated with the OPERABLE EDG. Per Specification 3.0.5, when in operating Modes 1, 2, 3, and 4 and a EDG is inoperable, systems, subsystems, trains, components or devices that depend on the EDG may be considered operable provided: 1) its normal power source is operable and 2) all of the redundant systems, subsystems, trains, components and devices are operable or likewise satisfy the requirements of TS 3.0.5. Unless both of these conditions are satisfied, action is initiated to place the unit in a mode in which the applicable LCO does not apply. If a system or component on the opposite train is inoperable, then condition 2 above would not be satisfied. Therefore no work activities would be scheduled on the train of equipment associated with the OPERABLE EDG since this would invoke the applicable TS actions for failure to meet the requirements of TS 3.0.5.

- E. No discretionary switchyard maintenance will be allowed. In addition, no discretionary maintenance will be allowed on the main auxiliary or startup transformers associated with the unit.

**Response:**

BVPS Regulatory Commitment No. 3 included in Attachment C of the EDG AOT Extension License Amendments Request includes the following commitments for entering the 14 day EDG AOT for scheduled maintenance:

- When an EDG is removed from service for scheduled maintenance, no discretionary switchyard maintenance will be allowed. In addition, switchyard access will be strictly controlled by the control room operating crew to minimize the potential for offsite power transients.



- If an EDG is unavailable, the offsite power circuits will be removed from service only for corrective maintenance required to restore operability.

F. The Operations crews will be briefed concerning the unit activities, including compensatory measures established following instruction of the Shift Manager upon the loss of power event. This briefing will be performed upon or prior to assuming the Watch for the first time after having scheduled days off while the AOT is in effect.

**Response:**

At the beginning of each shift the BVPS operations crew conducts a shift briefing. The briefing reviews the unit status, including major equipment outages and planned actions during the shift. As part of good operating practice, when an EDG has been removed from service under the provisions of the proposed AOT, the shift operations briefing will review the status of the EDG removed from service and the EDG AOT restrictions/compensatory measures established. Plant operators are trained on the actions to be taken for a loss of power event.

## **ATTACHMENT B**

### **Letter L-04-152**

#### **BVPS Risk Management Program Expectations by Risk Category**

##### **GREEN RISK**

- Work the Schedule. Preventative, surveillance and some corrective maintenance activities are reflected in the Baseline Risk Index for each Unit.
- Minimizing the duration for any activities that accrue risk will always help to reduce the total risk accumulated.

##### **YELLOW RISK (>2x Baseline)**

- Heightened awareness for all station personnel. Need to communicate that some risk important system or component is unavailable and any undesired action may have its consequences magnified.
- Protected Train postings shall be employed for available equipment on the opposite train.
- All parts (if required) are available at T+1 and staged prior to commencing work activities. Activities involving clearances must have a walkdown completed prior to commencing work activities.
- Pre-job briefs should include discussion concerning what risks are involved with this work and what undesired actions should be avoided during this activity.
- For any Yellow risk activity scheduled for 24 hours or more and results in an integrated risk greater than 1.0E-6, additional communications (e.g. e-mail, BVTV, electronic message board, etc.) will be used to inform station personnel. The duration of the Yellow risk activity should be minimized using appropriate resource scheduling (e.g. working the activity around the clock, or using 12-hour shifts based on resource availability). These activities will also require FENOC supervisory oversight during this activity.
- For any Yellow risk activity scheduled for 4 hours or more and results in an integrated risk greater than 1.0E-6, additional communications (e.g. e-mail, BVTV, electronic message board, etc.) will be used to inform station personnel. These activities will also require FENOC supervisory oversight during this activity.
- Configurations that result in a Core Damage probability (CDP) > 1.0E-06 will require that we "assess non-quantifiable factors, and establish risk management actions".

##### **ORANGE RISK (>10x Baseline)**

- Assess the Incremental Core Damage Probability (ICDP). ICDP > 1.0E-05 shall receive additional review. NUMARC 93-01 states that you should not voluntarily enter a configuration whose ICDP > 1.0E-05.
- The signatures of the Plant Manager and the Operations Manager are required to perform the planned maintenance activity that will result in an Orange Risk condition.
- Heightened awareness for all station personnel. Need to communicate that some high-risk system or component is unavailable and any undesired action may have its consequences magnified.
- Recommend considering this work activity for performance as an Infrequently Performed Test and Evolution (IPTE). Activity needs to work around the clock.
- FENOC supervisory oversight is required during the entire work activity. Consider using a Project Manager to lead this evolution.
- Protected Train postings shall be employed for available equipment on the opposite train.
- Contingency Plans are required for this work activity.
- A presentation for this activity shall be given at the morning Managers' meeting in the T+2 week.
- All parts shall be available at T+1 and shall be staged prior to commencing work activities.
- Pre-job briefs shall include discussion concerning what risks are involved with this work and what undesired actions must be avoided during this activity.
- Additional communications (e.g., e-mail, BVTV, electronic message board, etc.) will be used to inform station personnel.

**RED RISK (>1.0 E-03)**

- Assess the Incremental Core Damage Probability (ICDP). ICDP > 1.0E-05 shall receive additional review. NUMARC 93-01 states that you should not voluntarily enter a configuration whose ICDP > 1.0E-05.
- Maintenance activities should not be planned such that a RED Risk condition would result. Maintenance activities that would result in a RED Risk condition should be evaluated for an outage activity. If planned maintenance activity that will result in a RED Risk condition must be performed on-line, the signature of the Site Vice-President will be required to perform this activity. Prior to pursuing this on-line work activity, there should be site discussions that include PRA Engineering and Regulatory Affairs. Consideration should also be given to discussions with the NRC Resident and the region SRA.
- Heightened awareness for all station personnel. Need to communicate that the station will be in a very high-risk condition for this maintenance activity. Any undesired action may have its consequences magnified. Additional communications (e.g., e-mail, BVTv, electronic message board, etc.) will be used to inform station personnel.
- This work activity shall be performed as an Infrequently Performed Test and Evolution (IPTE). Activity needs to work around the clock.
- FENOC supervisory oversight is required during the entire work activity.
- Protected Train postings shall be employed for any available equipment that is being relied upon to mitigate core damage during this configuration. Evaluate possible use of Security to enforce these postings.
- Contingency Plans shall be developed and pre-staged, if necessary, for this work activity.
- A presentation for this activity shall be given at the morning Managers' meeting in the T+2 week.
- All parts shall be available at T+1 and shall be staged prior to commencing work activities.
- Pre-job briefs shall include discussion concerning what risks are involved with this work and what undesired actions must be avoided during this activity.

## ATTACHMENT C

### Commitment List

#### Letter L-04-152

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 in this document. Any other actions discussed in the submittal represent intended or planned actions by Beaver Valley. These other actions are described only as information and are not regulatory commitments. Please notify Mr. Henry L. Hegrat, Supervisor - Licensing, at 330-315-6944, of any questions regarding this document or associated regulatory commitments.

Commitment	Due Date
<p>1. BVPS will implement the following communication requirements between BVPS and the System Control Centers when entering the 14 day EDG AOT:</p> <p>Prior to removing an EDG from service for scheduled maintenance and within 24 hours after removing an EDG for unscheduled maintenance, BVPS will contact the FirstEnergy and Duquesne Light Company System Control Centers to inform them of the planned/current EDG outage, schedule for restoration and the power needs of the station.</p>	Amendment Implementation
<p>2. The BVPS administrative procedures for implementing Section (a)(4) of the Maintenance Rule will be revised to reflect the following restrictions for entering the 14 day EDG AOT:</p> <p>An EDG will not be removed from service for planned on-line maintenance if the associated unit's steam driven auxiliary feedwater pump is out of service; and while in the EDG AOT, the steam driven auxiliary feedwater pump will not be removed from service for any planned maintenance.</p>	Amendment Implementation