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L-04-072

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
License Amendment Request Nos. 306 and 176

Pursuant to 10 CFR 50.90, FirstEnergy Nuclear Operating Company (FENOC) hereby requests an amendment to the above licenses in the form of changes to the Technical Specifications. The proposed amendment revises the current 72 hour action allowed outage time (AOT) specified in Technical Specification (TS) 3.8.1.1 to allow 14 days to restore an inoperable emergency diesel generator (EDG) to operable status. The proposed AOT change is based on a risk evaluation which was developed in accordance with the guidelines established in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" and Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications."

Additionally, the proposed amendment changes will delete TS surveillance requirement (SR) 4.8.1.1.2.b.1 which requires an EDG inspection, in accordance with the manufacturer's recommendations, every 18 months during shutdown. EDG periodic inspection requirements will be specified in a licensee controlled EDG maintenance program that will be referenced in the Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 Updated Final Safety Analysis Report (UFSAR).

The proposed changes will also modify footnote (1) of TS 3.8.1.1. Footnote (1) currently provides a 7 day time limit to restore EDG fuel oil properties not meeting the requirements of SRs 4.8.1.1.2.d.2 or 4.8.1.1.2.e to within limits. The proposed changes would provide clarifications to the current wording and permit the applicable action requirements to be delayed for up to 7 days when the EDGs are inoperable solely as a result of failure to meet SRs 4.8.1.1.2.d.2 or 4.8.1.1.2.e.

The proposed changes would allow online EDG maintenance activities that are currently performed during refueling outages and provide additional flexibility to resolve EDG

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deficiencies and avoid potential unplanned plant shutdown should a condition occur requiring extensive EDG corrective maintenance.

The FENOC evaluation of the proposed changes are presented in the Enclosure. The proposed Technical Specification changes are presented in Attachments A-1 and A-2 for BVPS Unit Nos. 1 and 2, respectively. The proposed Technical Specification Bases changes are presented in Attachments B-1 and B-2. The proposed Technical Specification Bases changes are provided for information only. New commitments contained within this submittal are described in Attachment C.

The Beaver Valley review committees have reviewed the changes. The changes were determined to be safe and do not involve a significant hazard consideration as defined in 10 CFR 50.92 based on the attached safety analysis and no significant hazard evaluation.

FENOC requests approval of the proposed amendments by February 18, 2005, so that sufficient time will be provided to include consideration of the proposed amendment in the work planning process for the next BVPS Unit No. 2 refueling outage, which is scheduled for the spring of 2005. Once approved, the amendments shall be implemented within 60 days.

If there are any questions concerning this matter, please contact Mr. Larry R. Freeland, Manager, Regulatory Affairs/Performance Improvement at 724-682-5284.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 26, 2004.

Sincerely,

L. William Pearce

Enclosure:
FENOC Evaluation of the Proposed Changes

Attachments:
A-1 Proposed BVPS Unit 1 Technical Specification Changes
A-2 Proposed BVPS Unit 2 Technical Specification Changes
B-1 Proposed BVPS Unit 1 Technical Specification Bases Changes (for information only)
B-2 Proposed BVPS Unit 2 Technical Specification Bases Changes (for information only)
C Commitment Summary

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

ENCLOSURE
FENOC Evaluation of the Proposed Changes

Beaver Valley Power Station
License Amendment Requests
306 (Unit 1) And 176 (Unit 2)

Subject: Emergency Diesel Generator Risk Informed Allowed Outage Time Extension

Table of Contents

Attachments

1.0 DESCRIPTION

This is a request to amend Operating Licenses DPR-66 (Beaver Valley Power Station Unit 1) and NPF-73 (Beaver Valley Power Station Unit 2).

The proposed changes will revise the current 72 hour action allowed outage time (AOT) specified in Technical Specification (TS) 3.8.1.1 to allow 14 days to restore an inoperable emergency diesel generator (EDG) to operable status. The proposed AOT is based upon both a deterministic and risk informed assessment. Deterministically, the proposed change is supported by the defense-in-depth basis that is incorporated into the plant design as well as in the approach to maintenance and operation. The proposed change is also supported by a plant specific risk analysis performed in accordance with NRC guidance for making risk-informed decisions and risk-informed changes to the plant Technical Specifications.

Additionally, the proposed changes will delete TS surveillance requirement (SR) 4.8.1.1.2.b.1 which requires an EDG inspection, in accordance with the manufacturer's recommendations, every 18 months during shutdown. EDG periodic inspection requirements will be specified in a licensee controlled maintenance program that will be referenced in the Updated Final Safety Analysis Report (UFSAR). Changes to the licensee controlled EDG maintenance program will be controlled under 10 CFR 50.59. The proposed changes would provide greater flexibility should an unexpected condition occur with the EDGs requiring extensive corrective maintenance and also allow the performance of preventive maintenance work on-line that currently can only be performed during shutdown.

The proposed changes will also modify footnote (1) of TS 3.8.1.1. Footnote (1) currently provides a 7 day time limit to restore EDG fuel oil properties not meeting the requirements of SRs 4.8.1.1.2.d.2 or 4.8.1.1.2.e to within limits. The proposed changes would provide clarifications to the current wording and permit the applicable action requirements to be delayed for up to 7 days when the EDGs are inoperable solely as a result of failure to meet SRs 4.8.1.1.2.d.2 or 4.8.1.1.2.e.

2.0 PROPOSED CHANGES

The proposed Technical Specification changes, which are submitted for NRC review and approval, are provided in Attachments A-1 and A-2 for Units 1 and 2 respectively. The changes proposed to the Technical Specification Bases are provided in Attachments B-1 and B-2 for Units 1

and 2 respectively. The proposed Technical Specification Bases changes do not require NRC approval. The Beaver Valley Power Station (BVPS) Technical Specification Bases Control Program controls the review, approval and implementation of Technical Specification Bases changes. The Technical Specification Bases changes are provided for information only. Attachment C provides a list of commitments associated with this License Amendment Request (LAR).

The proposed changes to the Technical Specifications, Technical Specification Bases have been prepared electronically. Deletions are shown with a strike-through and insertions are shown double-underlined. This presentation allows the reviewer to readily identify the information that has been deleted and added.

To meet format requirements the Technical Specifications and Bases pages will be revised and repaginated as necessary to reflect the changes being proposed by this LAR.

The following provides a description of the proposed BVPS Unit 1 and Unit 2 Technical Specification changes:

a. Action statement b of TS 3.8.1.1 for A.C. electrical power sources is revised to change the allowable time for restoring an inoperable EDG to operable status before initiating the station shutdown action requirements from the current 72 hours to 14 days.

b. TS surveillance requirement (SR) 4.8.1.1.2.b.1 is deleted. Requirements for periodic EDG inspections will be specified in a licensee controlled EDG maintenance program referenced in the UFSAR.

   The BVPS Unit 1 and Unit 2 UFSARs will be revised to include the following statement:

   "The emergency diesel generators are periodically inspected in accordance with a licensee controlled maintenance program. The emergency diesel generator maintenance program specifies required inspections based on the manufacturer's and Diesel Generator Owner's Group recommendations and industry operating experience. Changes to the emergency diesel generator maintenance program are controlled under 10 CFR 50.59."

c. Footnote (1) for TS 3.8.1.1 currently states:

"Fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e shall be brought within the specified limits within 7 days."

Footnote (1) is revised as follows:

"Required actions may be delayed for up to 7 days if the diesel generator(s) is inoperable solely due to the fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e."

This change provides clarification to the current wording which does not clearly define application of the associated action statements when an EDG is inoperable due to failure to meet the fuel oil property limits of SRs 4.8.1.1.2.d.2 or 4.8.1.1.2.e. The proposed change would permit the action requirements to be delayed for up to 7 days to allow time to restore the fuel oil back to within the specified limits.

3.0 BACKGROUND

3.1 Offsite Power Sources

The offsite power systems for both BVPS Unit 1 and Unit 2 consist of two physically independent circuits between the offsite transmission network and the onsite power systems. Each offsite circuit is supplied from one of two 138 KV switchyard buses through a system service transformer to the onsite 4 KV station service and emergency buses. A detailed description of the offsite power network and circuits to the onsite emergency buses is found in Chapter 8 of the UFSAR for each unit.

3.2 Emergency Diesel Generators

Each Beaver Valley unit is designed with two redundant 4 KV emergency buses. The onsite standby power source for each redundant 4 KV emergency bus is a dedicated EDG. The EDGs are 4160 V, three phase 60 Hz synchronous generators. Each EDG is seismically qualified, safety related and electrically and physically isolated from each other. The EDGs 2000-hour load rating is 2850 KW for Unit 1 and 4535 KW for Unit 2.

The EDGs supply onsite emergency AC power to those electrical loads needed to achieve safe shutdown of the plant or to mitigate the consequences

of any postulated accidents coincident with the loss of the normal and offsite AC power sources. Each EDG has sufficient capability for operating all required engineered safety equipment which must be operated in the event of any postulated accident.

3.3 Station Blackout Capability

A BVPS cross-tie connecting the normal 4KV buses at Unit 1 and the normal 4KV buses at Unit 2 provides the capability to power up either of the emergency 4KV buses at one unit from either of the EDGs at the other unit. In conformance with 10 CFR 50.63, BVPS utilizes the EDGs at each unit as an alternate AC power source to operate systems necessary for the required station blackout (SBO) coping duration and recovery therefrom. With the cross-tie, BVPS can cope with a postulated total loss of offsite power to both units coincident with the loss of all onsite power (EDGs) at one unit, by enabling any single available EDG at either unit to supply power to the required SBO loads at both units within one hour.

The SBO cross-tie circuit consists of two locally operated 4KV breakers installed in both the Unit 1 and Unit 2 normal 4KV busses interconnected by a cross-tie cable protected against the effects of weather related events. The normal to emergency 4KV bus connection and the EDG to emergency 4KV bus connections complete the circuit to the alternate AC power source. The cross-tie between the normal 4KV busses is disconnected (breakers racked out) during normal plant operation and requires manual operator action to place it into service during a SBO event. Energizing of the cross-tie and startup of equipment to cope with a SBO is administratively controlled and procedurally addressed by the Unit 1 and Unit 2 Emergency Operating Procedures.

3.4 Current Technical Specification Requirements

The operability of the AC and DC power sources and associated distribution systems during operation ensure that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant AC and DC power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix A to 10 CFR 50.

TS 3.8.1.1 "AC Sources – Operating", requires two independent offsite power sources and two separate and independent EDGs be operable in operating Modes 1, 2, 3 and 4. The Limiting Condition For Operation (LCO) specifies required actions to be taken in the event of AC source inoperability including when one or both offsite sources are declared inoperable, when one or both EDGs are declared inoperable or when an offsite source is declared inoperable in combination with an inoperable EDG. The required AOTs for restoring inoperable AC sources to operability is consistent with Regulatory Guide 1.93, "Availability of Electric Power Sources".

In the event that one of the required EDGs becomes inoperable, the LCO requires the inoperable EDG be returned to operable status within 72 hours, or a plant shutdown be initiated by transitioning to Hot Standby within 6 hours, and Cold Shutdown within the following 30 hours. If two EDGs become inoperable, the LCO requires that one of the inoperable EDGs be returned to operable status within 2 hours. The remaining inoperable EDG must be returned to operable status within the 72 hour AOT for that EDG.

In the event that one of the required offsite power circuits becomes inoperable, the LCO requires the inoperable offsite power circuit be returned to operable status within 72 hours, or a plant shutdown be initiated. If two offsite power circuits become inoperable, the LCO requires that one of the inoperable circuits be returned to operable status within 24 hours.

If both one of the required offsite power circuits and an EDG are inoperable, the LCO requires one of the inoperable power sources be returned to operable status within 12 hours, or a plant shutdown initiated.

In addition, TS applicability statement 3.0.5 discusses operability considerations for systems and components that depend on the EDGs as a source of emergency power. Per TS 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 associated with the remaining operable EDG 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. These actions

ensure that a loss of offsite power event will not result in a complete loss of safety function of critical systems during periods when a EDG is inoperable.

SR 4.8.1.1.2.b.1 states that at least once per 18 months, during shutdown the EDGs will be subjected to an inspection in accordance with procedures prepared in conjunction with its manufacture's recommendations. This inspection requirement is primarily associated with maintaining EDG reliability.

SR 4.8.1.1.2.d.2 verifies, within 31 days of new EDG fuel oil addition, that the fuel oil properties specified in Table 1 of ASTM D975-81 beyond those specified in SR 4.8.1.1.2.d.1 are within limits. SR 4.8.1.1.2.e verifies, every 31 days, that the stored fuel oil total particulate contamination is within the specified limits.

4.0 TECHNICAL ANALYSIS

4.1 SR 4.8.1.1.2.b.1 Deletion

SR 4.8.1.1.2.b.1 requires performance of a EDG inspection, at least once every 18 months during shutdown, in accordance with procedures prepared in conjunction with the manufacturer's recommendations for this class of standby service. Reliability centered inspections and maintenance overhauls, while important, do not meet the requirements set forth in 10 CFR 50.36 for incorporation into the TS, and are not activities that are generally used to demonstrate component operability. Deletion of this surveillance requirement is acceptable because the licensee controlled EDG maintenance program will continue to require periodic inspections based on the manufacturer's and Diesel Generator Owner's Group recommendations and industry operating experience. Changes to the EDG maintenance program will be controlled under 10 CFR 50.59. In addition, the effectiveness of the maintenance on the EDGs is monitored in accordance with the Maintenance Rule, 10 CFR 50.65 and assures that high reliability of the EDGs will be maintained. Similar changes have been reviewed and approved by the NRC for various other stations. This inspection requirement is not included in the Standard Technical Specifications for Westinghouse Plants, NUREG 1431.

Also note that the EDG manufacturers and EDG owners groups have recently endorsed changes to the current 18 month inspection frequency to

allow a 24 month inspection frequency. Removal of this SR from the Technical Specifications and reliance on a licensee controlled EDG maintenance program to perform the required inspections will provide BVPS the flexibility to evaluate and make changes to the EDG inspection frequencies based on industry recommendations under the provisions of 10 CFR 50.59.

4.2 Modification to Footnote (1) of TS 3.8.1.1

SR 4.8.1.1.2.d.1 requires verification of specific EDG fuel oil properties prior to the addition of new fuel oil to the storage tanks. SR 4.8.1.1.2.d.2 requires verification of additional fuel oil properties as specified in Table 1 of ASTM D975-81 within 31 days of the new fuel oil addition. The fuel oil properties of SR 4.8.1.1.2.d.2, even if they are not within the specified limits, do not have an immediate effect on EDG operation but ensure the availability of high grade fuel oil for the EDGs. SR 4.8.1.1.2.e requires verification, at least once every 31 days, that the stored fuel oil total particulate contamination is within the specified limits. The presence of particulate does not mean failure of the fuel oil to burn properly in the diesel engine, and particulate concentration is unlikely to change significantly between surveillance intervals to the point where fouling of filter and fuel oil injectors would be of concern.

Failure to meet either of the above surveillances due to fuel oil properties not being within limits would require the EDG to be declared inoperable. However, based on the above considerations, it is reasonable to allow a brief period prior to initiating the required actions for an inoperable EDG. The 7 day time period would allow additional time to investigate and restore the fuel oil to within the specified limits.

This change provides clarification to the current wording which does not clearly define application of the associated action statements when an EDG is inoperable due to failure to meet the fuel oil property limits of SRs 4.8.1.1.2.d.2 or 4.8.1.1.2.e. The 7 day allowance for restoring fuel oil properties to within limits is consistent with Regulatory Guide 1.137, position C.2.a which states fuel oil properties contained in the supply tank not meeting these specifications should be replaced in a short period of time (about a week). This change is also consistent with the Standard Technical Specifications for Westinghouse Plants, NUREG 1431, which allows 7 days

for restoring EDG fuel oil particulate to within limits (and up to 30 days for restoring new fuel oil properties to within limits) prior to declaring the EDGs inoperable.

This proposed change is acceptable because the fuel oil properties that are not within the specified limits will not have an immediate effect on EDG operability and restoring the fuel oil to within limits within 7 days will ensure the availability of high grade fuel oil for the EDGs.

4.3 EDG AOT Extension

The following sections provide an evaluation of the proposed EDG AOT extension with regard to the principles that adequate defense-in-depth is maintained, that sufficient safety margins are maintained, and that the proposed increases in core damage frequency and risk are small and consistent with the guidance of Regulatory Guide 1.174 and Regulatory Guide 1.177.

4.3.1 Deterministic Assessment of Proposed EDG AOT Extension

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. Since the emergency power systems can accommodate a single failure, extending the AOT for an out of service EDG has no impact on the system design basis. Safety analyses acceptance criteria as provided in the UFSAR are not impacted by this change. AC power sources credited in the accident analyses will remain the same.

To ensure that the single failure design criterion is met, Limiting Conditions for Operation (LCOs) are specified in the plant Technical Specifications requiring all redundant components of the onsite power system to be operable. When the required redundancy is not maintained action is required within a specified time period, referred to as the allowed outage

time, to initiate a plant shutdown and place the plant in a safe condition. The allowed outage time provides a limited time to restore equipment to operable status and represents a balance between the risk associated with continued plant operation with less than the required system or component redundancy and the risk associated with initiating a plant transient while placing the unit in a safer condition. Thus, while the AOTs provided in the plant TS action statements are designed to permit limited operation with a temporary relaxation of the single failure criterion, the acceptability of the maximum length of the AOT interval relative to the potential occurrences of design basis events needs to be considered. Since the design basis for standby EDG power is not changed by extending the AOT for a single inoperable EDG, the risk impact of EDG unavailability during the extended AOT interval must be evaluated quantitatively using a probabilistic approach.

In the event that an EDG is inoperable in operating Modes 1, 2, 3, and 4, existing Specification 3.0.5 requires that within two hours all required systems, subsystems, trains, components and devices that depend on the remaining operable EDG as a source of emergency power be verified to be operable. This required action is intended to provide assurance that a loss of offsite power event will not result in a complete loss of safety function during the period when one of the required EDGs is inoperable.

The BVPS design satisfies the SBO Rule by evaluating a one hour AC independent coping capability and providing alternate AC (AAC) power from the non-blacked out unit's EDGs within one hour of the SBO event. The AAC power is supplied by a unit cross-tie at the 4 KV level as described in Section 3.3. Each EDG has sufficient capacity and capability to provide power for the safe shutdown of both units for the 4 hour station blackout duration. The assumptions and the results of the SBO analyses are not changed by an extension of the AOT, and compliance with 10 CFR 50.63 will be maintained. In addition, the BVPS EDG Reliability Program ensures that EDG reliability is maintained at or above the SBO target level, and the effectiveness of maintenance on the EDGs and support systems is monitored pursuant to the Maintenance Rule.

Based on the above discussion, extending the AOT for a single inoperable EDG from 72 hours to 14 days is acceptable because the proposed change will not impact the plant design basis and safety margins are maintained.

The impact of extended plant operation with less than the required equipment redundancy is evaluated in a probabilistic framework in the following section.

To ensure that the risk associated with extending the AOT for an EDG is minimized, and consistent with the philosophy of maintaining defense in depth, restrictions will be applied when removing an EDG from service as described in the tier 2 evaluation of section 4.3.2. These measures will ensure the risks associated with removing an EDG from service are managed to minimize the increase in risk during the out of service time.

4.3.2 Evaluation of Risk Impact

FENOC's evaluation of the risk associated with the proposed AOT conforms to the three-tiered approach that is identified in Regulatory Guide 1.177. Tier 1 consists of the PSA capability and Insights; Tier 2 identifies risk-significant plant configurations that should be avoided; and Tier 3 describes the implementation of a risk-informed configuration risk management program. Evaluations of each of these tiers are provided below. Presented first, however, is a discussion on the BVPS Unit 1 and Unit 2 PRA Model capabilities for evaluating the proposed AOT change.

BVPS PRA Model Capabilities

Scope and Quality of PRA

For this Emergency Diesel Generator Allowed Outage Time extension application, the scope of the PRA model used encompassed both level 1 and level 2, internal and external initiating events during power operation. Shutdown risk was not evaluated within the scope of the PRA model.

The PRA models have been extensively reviewed including internal multi-disciplined reviews during the Individual Plant Examination (IPE) process, internal and external PRA consultant reviews during the PRA model updates, and a Westinghouse Owner's Group Peer review conducted in July 2002.

Summary of Changes Since the IPE

Various changes have been made to the BVPS PRA models since the IPE submittal. Significant Level 1 changes that may be relevant to the EDG AOT risk analyses are provided below:

- Seismic and fire PRA models were developed in response to the Individual Plant Examination of External Events (IPEEE). These external event models are directly included with the internal events and internal flood initiators in the linked event tree models.
- The updated models use the latest industry methodology for determining Reactor Coolant Pump (RCP) Seal LOCAs. This methodology is based on Westinghouse's WCAP-15603, Revision 0, "WOG 2000 Reactor Coolant Pump Seal leakage Model for Westinghouse PWRs"; however, it is slightly modified to account for NRC review comments on the WCAP. This modification uses a number 1 seal popping-and-binding failure probability P(PB1) of 0.025 (which is the same as the Brookhaven Model) instead of 0.0125. With this new RCP Seal LOCA model there is now a 78% probability that the seal leakage will not exceed 21 gpm per RCP during the loss of all seal cooling condition, which accounts for the installed high-temperature o-rings on the RCPs.
- The revised RCP Seal LOCA frequency also includes plant specific thermal hydraulic analyses performed with MAAP 4.0.4, which now accounts for sequences that do not go to core melt during a 48 hour period, given that Auxiliary Feedwater (AFW) or Dedicated AFW is available, as non-core damage sequences. These analyses were performed for both Station Blackout and loss of all river water scenarios. RCP Seal LOCA sequences that uncover the core before 48 hours, but after 24 hours, now use an electric power recovery factor based on the probability of not recovering offsite power before core damage occurs using the Plant-Centered LOSP Recovery lognormal distribution reported in NUREG/CR-5496 and the median probability of not recovering at least one emergency diesel generator at times greater than 24 hours (if available for recovery).
- The initiating events data is based on Westinghouse WCAP-15210, Revision 1, "Transient Initiated Event Operating History Database for U.S. Westinghouse NSSS Plants (1987 – 1997)" to develop a generic prior and then Bayesian updated using Beaver Valley Power Station

actual plant experience. Additionally, LOCA initiating event frequencies are now based on the interim LOCA frequencies taken from Table 4.1 of the "Technical Work to Support Possible Rulemaking for a Risk-Informed Alternative to 10CFR50.46/GDC 35", Revision 1, Dated July 2002, to account for aging-related failure mechanisms.

- The Electric Power Recovery model is updated with the latest system models and credits more scenarios with recovery of the fast bus transfer breakers, emergency diesel generators, and the offsite grid.
- Based on the BVPS PRA Peer Review comments, the success terms for the component failure data was revisited and checked against the Maintenance Rule estimated demands and operating time provided by the System Engineering Section. This success data was also compared against data collected in previous PRA model updates to ensure its consistency. Any discrepancies between that used in previous model data were resolved and the failure data was revised using a Bayesian update process.
- The reactor trip breaker failure rates are now based on NUREG/CR-5500, Volume 2, "Reliability Study: Westinghouse Reactor Protection System, 1984-1995", and then Bayesian updated using a more detailed analysis of actual plant experience.
- The Solid State Protection System split fractions are now based on a CAFTA model using BVPS Unit 2 plant specific components and Westinghouse generic failure rates. This model was developed as part of the risk-informed application for the Unit 2 Slave Relay Surveillance Test Interval Extension.

There were 4 major Level 2 changes incorporated into the updated BVPS PRA models. Three of these changes dealt with sequences involving induced steam generator tube ruptures, large containment failures due to early hydrogen burns, and large containment failures due to alpha-mode (in-vessel steam explosions). Based on Westinghouse and industry state-of-the-art knowledge of these containment phenomenologies, it is now believed that the probabilities of these occurring are extremely low and are non-credible in large containment failures or bypasses. The fourth change involved the way steam generator tube ruptures were accounted for in the LERF definition. In the updated PRA model, only steam generator tube ruptures that are faulted and have a depleted Refueling Water Storage Tank (RWST) or have a loss of all secondary cooling are considered to be LERF

contributors. It is assumed that leakage from the RCS will continue indefinitely through the faulted steam generator and the core will uncover after the RWST depletes. This is in agreement with WCAP-15955, "Steam Generator Tube Rupture PSA Notebook".

Plant Model Applicability/Acceptability for Evaluating the Proposed Changes

The scope, level of detail, and quality of the BVPS PRA models are technically adequate to support this application. The PRA technical acceptability of the models used in the development of this risk informed application has been demonstrated by a peer review process. This peer review was conducted in July 2002, by the Westinghouse Owner's Group, with the final documentation of the review issued in December 2002. The Peer Review Team focused primarily on the Unit 2 PRA for this review, but was provided with information regarding unit differences and modeling differences. After the peer review, the preliminary Category A and B observations that potentially impacted the models were entered into the BVPS Corrective Action Program, dispositioned, and incorporated into updated PRA models. These updated PRA models were then used to quantify the sensitivity cases developed for the diesel generator AOT extension.

Maintenance & Update of the PRA

The maintenance and updating of the BVPS PRA models are controlled by Administrative Procedure 1/2-ADM-2033, "Risk Management Program", and Business Practice BVBP-DES-0001, "Probabilistic Risk Assessment Guideline." The administrative procedure ensures that the PRA models are kept current with the plant design and operation, and provides the general processes used for configuration control of the PRA models in the areas of plant and system models, and data analysis. It also contains the requirements for PRA model periodic updating. The business practice provides guidance details for maintaining and updating the PRA models.

Currently, the BVPS PRA models were developed using RISKMAN for Windows, Version 4.10 PRA software, which is maintained as Software Quality Assurance Category B in the FENOC usable software program. The software was installed and tested against the verification model provided by

the vendor to ensure that it functions properly on the personal computers. The verification model was reviewed and validated to be an appropriate test case. Software configuration control is maintained by only having one version of RISKMAN for Windows installed on the PRA group personal computers. Periodic updates to the RISKMAN software are provided by the vendor as part of a user's group. These updates undergo verification in accordance with the vendors quality assurance program and include enhancements and resolutions to identified problem reports.

Tier 1: Analysis of Risk Impact and Calculated Results

In Tier 1 the impact of the AOT change on core damage frequency (CDF), incremental conditional core damage probability (ICCDP), large early release frequency (LERF), and incremental conditional large early release probability (ICLERF) needs to be determined.

A quantitative risk evaluation of the impact of extending the current BVPS EDG AOT from 3 days (72 hours) to 14 days was performed using the BVPS Unit 1 and Unit 2 PRA Models. The change in CDF, the change in LERF, ICCDP and ICLERP were calculated per the guidance in Regulatory Guide 1.177 for the proposed EDG AOT extension.

The evaluation calculated the risk impacts based on estimated mean outage (unavailability) times for the current and proposed AOTs. The primary use of the additional time provided by the proposed AOT extension is expected to be for performance of at power preventive maintenance (PM) activities which are currently performed when the units are shutdown. With the proposed AOT extension, the mean Unit 1 EDG unavailability for surveillance tests and maintenance activities was estimated to increase from 67.6 hrs/yr per EDG (or 0.77% unavailability) to 252 hrs/yr per EDG (or 2.88% unavailability). With the proposed AOT extension, the mean Unit 2 EDG unavailability for surveillance tests and maintenance activities was estimated to increase from 30.47 hrs/yr per EDG (or 0.348% unavailability) to 156.8 hrs/yr per EDG (or 1.79% unavailability).

The estimated EDG unavailability values were based on past maintenance and testing durations from previous operating cycles and refueling outages. The estimated unavailability values also included planned changes to the

EDG inspection frequencies which will change the current 18 month inspections to a 24 month frequency. This frequency change has been previously endorsed by the EDG manufacturers and owners groups. In addition, past corrective maintenance repair durations were increased by the ratio of the proposed AOT increase when estimating corrective maintenance durations under the proposed AOT.

Note that the above values for EDG unavailability are mean estimated yearly average EDG unavailability used to perform the risk assessment. These values are based on the estimated yearly average contribution to EDG unavailability for each of the preventive maintenance activities performed at various maintenance frequencies (from every 18 months to every 13 years), along with the estimated testing and corrective maintenance activities, and do not necessarily reflect the specific unavailability during any specific operating cycle or year. As discussed in Section 4.3.3, the Maintenance Rule Monitoring Program and EDG performance criteria will be used to monitor EDG availability with the extended AOT.

To calculate the risk impact (change in CDF and LERF caused by the extended AOT) six sensitivity cases were run for each unit as described below:

Case 1

Case 1 modeled the current EDG unavailability. This sensitivity case was run by changing the EDG unavailability from 2.5%, which is the current value used in the BVPS Unit 1 and Unit 2 PRA models, to the present mean unavailability of the EDG under the current AOT or 0.77% (Unit 1) and 0.348% (Unit 2).

Case 2

Case 2 modeled the expected EDG unavailability with the extended AOT. This sensitivity case was run by changing the EDG unavailability from 2.5%, which is the current value used in the BVPS Unit 1 and Unit 2 PRA models, to the estimated EDG unavailability under the proposed AOT of 2.88% (Unit 1) and 1.79% (Unit 2).

Case 3

Case 3 modeled one EDG in a preventive maintenance alignment with the other EDG available. Since this is planned maintenance, the common cause failure of the available EDG was zeroed out and only independent failure was modeled. This sensitivity case also eliminated the maintenance alignments for the normal and emergency busses. Since this is planned EDG maintenance, no concurrent maintenance would be allowed on the remainder of the available AC power system. To reduce risk of a loss of the available EDG due to a fire event, an hourly fire watch will be established in the available EDG room prior to removing an EDG from service for preventive maintenance. The initiating event frequency for a fire in the available EDG room was therefore reduced by a factor of 10 to credit this compensatory measure.

Case 4

Case 4 modeled one EDG in a corrective maintenance alignment and the offsite power circuits available. The common cause failure of the other EDG was set to the beta factor.

Case 5

Case 5 modeled one inoperable EDG due to corrective maintenance, one offsite power circuit unavailable, and common cause on the other EDG set to the beta factor.

Case 6

Case 6 modeled one EDG inoperable due to corrective maintenance and one offsite power circuit unavailable with common cause failures of the other EDG eliminated. Technical Specifications require that the other EDG be tested within 24 hours of an EDG being inoperable or the absence of common mode failure be demonstrated.

The CDF and LERF results for each of these cases (shown to three significant figures) is listed on Table 1 below:

Table 1
CDF and LERF Results for Sensitivity Cases

Case	BVPS-1		BVPS-2	
	CDF (per year)	LERF (per year)	CDF (per year)	LERF (per year)
Case 1 Baseline (Current EDG Unavailability)	2.34E-05	1.03E-06	3.27E-05	1.12E-06
Case 2 (14 day AOT Estimated Unavail.)	2.36E-05	1.03E-06	3.42E-05	1.12E-06
Case 3 (One EDG in PM Alignment)	2.45E-05	1.05E-06	4.29E-05	1.06E-06
Case 4 (One EDG in CM Alignment)	2.63E-05	1.05E-06	7.60E-05	1.07E-06
Case 5 (One EDG in CM Alignment) (One Offsite Power Circuit Unavail.)	3.37E-04	1.08E-05	2.01E-03	1.46E-06
Case 6 (One EDG in CM Alignment) (One Offsite Power Circuit Unavail.) (No Common Cause)	3.24E-04	1.09E-05	1.67E-03	1.34E-06

The increase in CDF and LERF due to the extended AOT can be calculated by the difference between CDF and LERF results for case 1 and case 2 as shown in Table 2 below:

Table 2
Change in CDF and LERF
Post AOT Extension

Risk Measure	BVPS-1 Increase over Baseline	BVPS-2 Increase over Baseline
Delta CDF	2.08E-07 / reactor yr	1.45E-06 / reactor yr
Delta LERF	5.0E-10 / reactor yr	7.0E-11 / reactor yr

As shown above, the BVPS Unit 1 calculated increases in CDF and LERF and the BVPS Unit 2 increase in LERF are less than the Regulatory Guide 1.174 acceptance guidelines of 1E-6 per reactor year for CDF and 1E-7 per reactor year for LERF for demonstrating a very small increase in risk (Regulatory Guide 1.174 Region III). The BVPS Unit 2 calculated increase

in CDF based on the change in EDG unavailability with the extended AOT meets the Regulatory Guide 1.174 acceptance guideline for a small change in risk of between 1E-6 per reactor year to 1E-5 per reactor year with the total CDF less than 1E-4 per reactor year (Regulatory Guide 1.174 Region II).

The increase in CDF and LERF for both BVPS units meet the acceptance guidelines of Regulatory Guide 1.174, however to show that the increase in CDF for BVPS Unit 2 also meets the acceptance guideline for a very small increase in risk, the expected CDF with the extended AOT was further evaluated for BVPS Unit 2 based on the expected time in preventive and corrective maintenance alignments. In this evaluation the preventive and corrective maintenance alignment included the consideration of no concurrent maintenance being performed on the offsite power supply to emergency buses therefore ensuring the availability of the remainder of the available AC power system as described in Case 3 and Case 4. Table 3 below provides the calculated conditional CDF for each alignment, the expected time in each alignment, and the resulting conditional core damage probability for that alignment. The time in a preventive maintenance alignment was increased to the full 14 day AOT. The sum of the CCDPs for each alignment during the year is the core damage frequency on a per year basis.

Table 3
BVPS-2 Conditional CDP
Using Expected Time in Maintenance Alignments

Case	Alignment Description	Conditional CDF (per yr)	Hrs	CCDP
Corrective Maint. (Case 4)	One EDG in Corrective Maintenance	7.60E-05	43.2	3.74E-07
Preventive Maint. (Case 3)	One EDG in Preventive Maintenance	4.29E-05	336	1.65E-06
Surveillances (Case 4)	One EDG in routine surveillance testing	7.60E-05	10.5	9.11E-08
Baseline (Case 1)	Base case assumptions for remainder of year	3.27E-05	8370.3	3.13E-05
			CCDP Summation	3.34E-05

The increase in the BVPS Unit 2 CDF based on the expected time in the preventive and corrective alignments is therefore:

Delta CDF = (CDF expected time in maint. alignments) - (CDF for Baseline)

= (3.34E-05) - (3.27E-05)

= 6.56E-07 per reactor year

The calculated increase in CDF for BVPS Unit 2 using the expected time in the preventive and corrective maintenance alignments is less than the Regulatory Guide 1.174 acceptance guideline of 1E-6 per reactor year for demonstrating a very small increase in plant risk.

In addition to the CDF and LERF calculations, the Incremental Conditional Core Damage Probability (ICCDP) and the Incremental Conditional Large Early Release Probability (ICLERP) while an EDG is unavailable during the extended AOT was calculated for comparison to the acceptance guidelines provided in Regulatory Guide 1.177. The ICCDP and ICLERP were calculated for both an EDG unavailable for preventive and corrective maintenance, as described below.

The ICCDP and ICLERP while an Emergency Diesel Generator is unavailable for preventative maintenance during the extended AOT was evaluated assuming one EDG is in a maintenance alignment, the other EDG is available, the offsite power circuits are available, and there is no diesel generator common cause failures (Case 3). Two sub cases are analyzed, one with the duration of the maintenance as the longest preventative maintenance activity expected to be performed at-power, secondly assuming the duration lasts the entire 14 day AOT. The results of this evaluation are shown in Table 4 below:

Table 4
ICCDP and ICLERP during EDG Preventive Maintenance

	BVPS-1		BVPS-2	
Maintenance Duration	**ICCDP**	**ICLERP**	**ICCDP**	**ICLERP**
Maximum Expected Duration (Unit 1-168 hrs) (Unit 2-264 hrs)	2.06E-08	4.03E-10	3.07E-07	Risk Neutral
Full 14 Day AOT	4.11E-08	8.07E-10	3.91E-07	Risk Neutral

To evaluate the ICCDP and ICLERP while an Emergency Diesel Generator is unavailable for corrective maintenance during the extended AOT, sensitivity cases 3, 4, 5 and 6 were used. The ICCDP and ICLERP was calculated assuming the full 14 day AOT using the results of the various maintenance alignments in cases 3, 4, 5 and 6 while crediting the restrictions in TS 3.8.1.1 action statements b and c for maximum allowable time for demonstrating absence of common cause failures and allowable time limit of 12 hours for a condition in which both the offsite power source and an EDG are inoperable.

The results of this evaluation are shown in the Table 5 below:

Table 5
ICCDP and ICLERP during EDG Corrective Maintenance

BVPS-1		BVPS-2	
ICCDP	**ICLERP**	**ICCDP**	**ICLERP**
4.75E-08	8.52E-10	4.93E-07	Risk Neutral

As can be seen from the results shown in Table 4, the BVPS Unit 1 and Unit 2 calculated ICCDP and ICLERP when an EDG is unavailable for preventive maintenance during the extended AOT are less than the Regulatory Guide 1.177 acceptance guidelines of 5.0E-07 for ICCDP and 5.0E-08 for ICLERP for both the maximum expected maintenance duration and the full 14 day AOT.

As shown on Table 5, the BVPS Unit 1 and Unit 2 calculated ICCDP and ICLERP when an EDG is unavailable for corrective maintenance during the

extended AOT, assuming the full AOT extension duration, are also less than the Regulatory Guide 1.177 acceptance guideline.

Tier 2: Avoidance of Risk Significant Plant Configurations

Tier 2 is an evaluation of potentially high risk significant configurations that could exist if equipment in addition to that associated with the TS change is taken out of service concurrently. The objective of Tier 2 is to ensure that appropriate restrictions are placed on risk significant configurations that would be relevant to the proposed TS change.

The availability of the Offsite Power Circuits to the 4KV Emergency Buses, the Station Blackout Alternate AC power source and Offsite Grid will affect the risk-significance of removing an EDG from service.

Offsite Power Circuits

Technical Specification 3.8.1.1, action statement c, for one offsite power circuit and one EDG inoperable requires that one of these inoperable power sources be restored within 12 hours or a plant shutdown be initiated.

The following Tier 2 restrictions will be required regarding EDG and offsite power circuit maintenance with the proposed AOT:

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

If a condition is entered in which both an EDG and an offsite power circuit are both unavailable at the same time, the EDG or the offsite power circuit will be restored to service within 12 hours as required by TS 3.8.1.1, action statement c.

Station Blackout Alternate AC

An EDG on each unit out of service at the same time would create a degraded condition with regard to the unaffected unit's ability to provide SBO alternate AC power to the other unit through the SBO cross-tie.

The following Tier 2 restrictions will therefore be required regarding EDG and SBO cross-tie maintenance with the proposed AOT:

- An EDG will not be removed from service for scheduled maintenance unless both of the opposite unit's EDG are available.
- An EDG will not be removed from service for scheduled maintenance unless the Station Blackout cross-tie circuits between the units are available.
- If an EDG is unavailable, an EDG on the opposite unit will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability or for the performance of required surveillance testing.
- If an EDG is unavailable, the station blackout cross-tie will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.

If a condition is entered in which both an EDG is unavailable and either the SBO cross-tie or an opposite unit's EDG become unavailable at the same time, BVPS will evaluate the plant condition using the BVPS Maintenance Rule configuration risk management program.

Offsite Grid Availability

To provide increased assurance of offsite grid availability during EDG maintenance with the proposed AOT the following Tier 2 restrictions will be used:

- An EDG will not be removed from service for scheduled maintenance if weather forecasts are predicting severe weather conditions for the BVPS area with the potential to degrade or limit offsite power availability.
- 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.

- 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.

The above Tier 2 restrictions will be required for entering the proposed EDG AOT for scheduled maintenance.

In addition to the above restrictions, the following compensatory measure will be required consistent with the assumptions used in the supporting risk analysis concerning fire events associated with the remaining operable EDG.

- Prior to entering the proposed EDG AOT for scheduled maintenance and within 24 hours after entering the proposed EDG AOT for unscheduled corrective maintenance (maintenance required to restore operability) an hourly fire watch will be established in the EDG room for the operable EDG.

The above Tier 2 restrictions and compensatory measures will be incorporated into the BVPS administrative procedures for implementing Section (a)(4) of the Maintenance Rule.

In addition to these pre-determined Tier 2 restrictions, assessments performed in accordance with the provisions of the Maintenance Rule paragraph (a)(4) will ensure that other potentially risk significant configurations are identified prior to removing an EDG from service for scheduled maintenance. The Maintenance Rule configuration risk management program also ensures that the risk significance of unexpected configurations resulting from unplanned maintenance or conditions, while an EDG is out of service, are properly evaluated.

Tier 3: Risk Informed Configuration Risk Management Program

Consistent with 10 CFR 50.65 (a)(4) BVPS has implemented a program that ensures that the risk impact of out-of-service equipment is appropriately

evaluated. This program provides a risk-informed process to manage the risk associated with planned and unplanned maintenance activities. The program ensures that the risk impact of out of service equipment is appropriately evaluated prior to performing a planned maintenance activity and soon after entering into an emergent maintenance condition. The program requires a review of maintenance activities to identify risk significant plant equipment outage configurations. This review is required both during the work management process and for emergent conditions during normal plant operation. The program includes provisions for performing a configuration dependent assessment of the overall impact on risk of proposed plant configurations prior to the performance of maintenance activities that remove equipment from service. Risk is re-assessed if an equipment failure/malfunction or emergent condition produce a plant configuration that has not been previously assessed.

The risk assessment is performed to ensure that the activity does not pose any unacceptable risk. This evaluation is performed using the BVPS PRA Models and the Safety Monitor Program to calculate core damage frequency (CDF) for actual plant conditions. The risk assessment results are classified by a color code based on the increasing levels of risk, using Green, Yellow, Orange and Red. Green risk extends from the no-maintenance baseline (NMBL) to 2 times the NMBL. Yellow risk ranges from 2 to 10 times the NMBL. Orange risk extends from 10 times NMBL to a CDF of 1.0 E-3 and the Red risk category is defined as a CDF of higher than 1.0 E-3. When entering maintenance configurations which result in Yellow risk levels, steps are taken to minimize duration of activities and increase supervisory oversight. Management approval is required for maintenance configurations which result in an Orange or Red risk level.

Prior to the performance of scheduled work, work activities are reviewed by Operations to ensure the scheduled activities are consistent with the protected train concept, ensure they are consistent with the risk evaluation performed during the work planning process and confirm that the overall safety impact has not changed due to emergent work or equipment failures.

4.3.3 Implementation and Monitoring Program

The reliability and availability of the EDGs at BVPS are monitored under the BVPS Maintenance Rule Program. If the pre-established reliability or availability performance criteria are exceeded for the EDGs, consideration must be given to 10 CFR 50.65 (a)(1) actions, including increased management attention and goal setting in order to restore the EDG performance to an acceptable level. The performance criteria provide the means to manage the overall risk of the EDGs being unavailable within the PRA assumptions and to ensure that no adverse safety degradation will occur over time due to the proposed extension of the EDG AOT.

Actual out-of-service time for the EDGs is minimized to ensure that Maintenance Rule availability performance criteria for these components are not exceeded.

Pursuant to 10 CFR 50.65 paragraph (a)(3), EDG reliability and availability are periodically evaluated relative to the established Maintenance Rule performance criteria and established goals, if applicable. Adjustments to performance criteria may result from this evaluation, however, performance of EDG on-line maintenance is not anticipated to result in exceeding the revised Maintenance Rule unavailability criteria for the EDGs. The EDGs are all currently in the 10 CFR 50.65 (a)(2) Maintenance Rule category (i.e. the EDGs are meeting established performance criteria). The present EDG availability performance criteria is greater than or equal to 99% at both units. Site Maintenance Rule criteria, including the EDG Maintenance Rule criteria, are currently being re-evaluated as a result of the recent PRA Model updates. These PRA updates included a change to the assumed unavailability of the EDGs from 1% to 2.5%. Maintenance Rule criteria established for the EDG will ensure the TS AOT does not degrade operational safety over time and will be used to identify and correct adverse trends. Compliance with the Maintenance Rule not only optimizes reliability and availability of important equipment, it also results in management of the risk when equipment is taken out of service for testing or maintenance per 10 CFR 50.65 (a)(4).

4.3.4 Conclusion

FENOC has evaluated the risk associated with extending the AOT for a single inoperable EDG from 72 hours to 14 days from both a qualitative and quantitative perspective, and found it to be acceptable. FENOC has concluded that the defense-in-depth philosophy will be maintained with the proposed AOT extension. The risk impact due to extending the AOT for an inoperable EDG has been evaluated using the three-tiered approach for performing risk assessments that is identified in the regulatory guidelines. The risk contributions associated with the increased EDG unavailability under the proposed AOT extension were quantitatively evaluated using the BVPS Unit 1 and Unit 2 PRA models. The calculated increases in the average CDF and LERF demonstrate a very small increase in risk. The calculations performed for ICCDP and ICLERP also demonstrate that the increase in plant risk is small when an EDG is unavailable with the extended AOT for both the preventive and corrective maintenance cases and consistent with the guidelines of RG 1.177. The tier 2 restrictions and the tier 3 Maintenance Rule (a)(4) configuration risk evaluation program will serve to reduce any increase in risk associated with the EDG AOT extension.

5.0 REGULATORY SAFETY ANALYSIS

This License Amendment Request proposes revising the BVPS Unit 1 and Unit 2 Technical Specifications (TS) to change the allowed outage time (AOT) for an inoperable emergency diesel generator (EDG). The proposed change allows an extension of the current Technical Specifications AOT from 72 hours to 14 days when a EDG is inoperable. The proposed changes will also delete TS surveillance requirement (SR) 4.8.1.1.2.b.1, which requires a EDG inspection, in accordance with the manufacturer's recommendations, every 18 months during shutdown. EDG periodic inspection requirements will be specified in a licensee controlled EDG maintenance program that will be referenced in the Updated Final Safety Analysis Report (UFSAR). Additionally, the proposed changes will revise footnote (1) of TS 3.8.1.1 to permit the applicable action requirements to be delayed for up to 7 days when the EDGs are inoperable solely as a result of failure to meet Surveillance Requirements 4.8.1.1.2.d.2 or 4.8.1.1.2.e. for EDG fuel oil properties.

5.1 No Significant Hazards Consideration

FirstEnergy Nuclear Operating Company (FENOC) has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10CFR50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change does not affect the design, operational characteristics, function or the reliability of the EDGs. The EDGs are not initiating conditions for any accident previously evaluated. The EDGs mitigate the consequences of previously evaluated accidents involving a loss of offsite power.

The consequences of any previously analyzed accident will not be significantly affected by extending the AOT for a single EDG since the remaining EDG supporting the redundant Engineered Safety Features systems will continue to be available to perform the accident mitigation functions. In addition, to fully evaluate the effects of the proposed EDG AOT extension, a Probabilistic Risk Assessment was performed to quantitatively assess the risk impact of the proposed change for each unit. The results of this risk assessment concluded that the increase in plant risk is very small and consistent with the guidance contained in Regulatory Guide 1.174 and Regulatory Guide 1.177.

The deletion of TS surveillance requirement 4.8.1.1.2.b.1 from the Technical Specifications will not impact the capability of the EDGs to perform their accident mitigation functions. The required EDG maintenance inspections will continue to be performed in accordance with the licensee EDG maintenance program. The risk of performing the maintenance inspections during power operation has been considered in the EDG AOT extension supporting risk evaluation and determined to be acceptable.

The proposed change to footnote (1) of TS 3.8.1.1 will also not impact the capability of the EDGs to perform their accident mitigation

functions. Fuel oil properties that are not within the specified limits will not have an immediate effect on EDG operation and restoring the fuel oil to within limits within 7 days will ensure the availability of high grade fuel oil for the EDGs.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes do not involve a change in the design, configuration, or method of operation of the plant. The changes do not involve the addition of new equipment or the modification of existing equipment. As such, no new failure modes are introduced by these changes.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed changes do not alter the plant design and do not affect any assumptions or inputs to the safety analysis. The proposed changes to the EDG allowed outage time have been evaluated both deterministically and using a risk informed approach. These evaluations demonstrate that power system design defense-in-depth capabilities will be maintained and that the risk contribution is small.

In addition, the proposed deletion of the EDG maintenance inspection surveillance requirements from the TS and modifications to the EDG action requirements associated with the EDG fuel oil surveillances will not impact the EDG reliability and their capability to perform their accident mitigation function.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, FENOC concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10CFR50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

A summary of the applicable regulatory requirements and criteria is provided in the following tables. In the following paragraphs the applicable criteria as they relate to the proposed changes are discussed.

General Design Criteria		Assessment
17	Electric Power Systems	No Impact

10 CFR Part 50		Assessment
50.63	Loss of All Alternating Current Power	No Impact

NRC Regulatory Guides		Assessment
1.6	Independence Between Redundant Standby (Onsite) Power Sources and Between their Distribution Systems	No Impact
1.9	Selection, Design and Qualification of Diesel Generator Units Used as Standby (Onsite) Electric Power Systems at Nuclear Power Plants	No Impact
1.93	Availability of Electric Power Sources	Impacted
1.137	Fuel-Oil Systems for Standby Diesel Generators	No Impact
1.155	Station Blackout	No Impact

BVPS conformance to 10 CFR 50, Appendix A, General Design Criterion 17 and NRC Regulatory Guides (RG) 1.6, 1.9 and 1.137 will not be impacted by the proposed changes to the BVPS TS. The proposed changes to the EDG action requirements and deletion of the EDG manufacturer's maintenance inspection surveillance requirements from the TS will not alter the design, selection, independence or qualifications of the onsite power systems. In addition, the BVPS method of compliance with 10 CFR 50.63 and RG 1.155 will not be impacted as discussed above.

Conformance with RG 1.93, as described in the Unit 2 UFSAR, is impacted by the proposed changes. RG 1.93 specifies a maximum AOT of 72 hours

for an inoperable AC power source and states the 72 hour AOT will not be entered for preventive maintenance of the EDGs. If the proposed changes are approved, BVPS will continue to conform to RG 1.93 with the exception that the allowable time for restoration of an inoperable EDG will be increased from 72 hours to 14 days and EDG preventive maintenance will be permitted during the allowed outage time. The Unit 2 UFSAR will be updated to reflect these changes.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10CFR20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. BVPS Unit 1 UFSAR, Section 8 "Electrical Systems"
2. BVPS Unit 2 UFSAR, Chapter 8 "Electric Power"
3. 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants."
4. 10 CFR 50.63 "Loss of All Alternating Current Power"

5. Standard Technical Specifications for Westinghouse Plants, NUREG 1431, Revision 2

6. BVPS Units 1 & 2 NRC Safety Evaluation Related to Station Blackout (TAC Nos. 68510 and 68511), dated November 23, 1990

7. Regulatory Guide 1.6, "Independence Between Redundant Standby (Onsite) Power Sources and Between their Distribution Systems," March, 1971

8. Regulatory Guide 1.9, "Selection, Design and Qualification of Diesel Generator Units Used as Standby (Onsite) Electric Power Systems at Nuclear Power Plants," December, 1979

9. Regulatory Guide 1.93, "Availability of Electric Power Sources," December, 1974

10. Regulatory Guide 1.137, "Fuel-Oil Systems for Standby Diesel Generators," October, 1979

11. Regulatory Guide 1.155, "Station Blackout," August, 1988

12. Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," November 2002

13. Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," August, 1998

Attachment A-1

Beaver Valley Power Station, Unit No. 1
Proposed Technical Specification Changes

License Amendment Request No. 306

The following is a list of the affected pages:

3/4 8-1
3/4 8-2
3/4 8-3
3/4 8-4

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generators each with:

1. Separate day and engine-mounted fuel tanks containing a minimum of 900 usable gallons of fuel,

2. A separate fuel storage system containing a minimum of 17,500 usable gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one offsite circuit inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

b. With one diesel generator(1) inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than an independently testable component, testing or preplanned preventative maintenance, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing

(1) Required actions may be delayed for up to 7 days if the diesel generator(s) is inoperable solely due to the ~~F~~fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e., ~~shall be brought within the specified limits within 7 days.~~

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

Surveillance Requirement 4.8.1.1.2.a.5 within 24 hours[2] unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated. Restore the diesel generator to OPERABLE status within ~~72 hours~~14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With one offsite circuit and one diesel generator[1] inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than an independently testable component, testing or preplanned preventative maintenance, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.5 within 8 hours[2] unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated. Restore one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Action Statement a or b, as appropriate with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable A.C. power source. A successful test of diesel OPERABILITY per Surveillance Requirement 4.8.1.1.2.a.5 performed under this Action Statement for an OPERABLE diesel or a restored to OPERABLE diesel satisfies the diesel generator test requirement of Action Statement b.

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(1) Required actions may be delayed for up to 7 days if the diesel generator(s) is inoperable solely due to the ~~F~~fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e., ~~shall be brought within the specified limits within 7 days.~~

(2) This action is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

d. With two of the required offsite A.C. circuits inoperable, restore one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Following restoration of one offsite source, follow Action Statement a with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable offsite A.C. circuit.

e. With two of the required diesel generators(1) inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Following restoration of one diesel generator unit, follow Action Statement b with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable diesel generator. A successful test of diesel OPERABILITY per Surveillance Requirement 4.8.1.1.2.a.5 performed under this Action Statement for a restored to OPERABLE diesel satisfies the diesel generator test requirement of Action Statement b.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months by transferring (manually and automatically) unit power supply from the unit circuit to the system circuit.

(1) Required actions may be delayed for up to 7 days if the diesel generator(s) is inoperable solely due to the ~~F~~fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e. ~~shall be brought within the specified limits within 7 days.~~

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day and engine-mounted fuel tank,

2. Verifying the fuel level in the fuel storage tank,

3. (Deleted)

4. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the day and engine-mounted tank,

5. Verifying the diesel starts from standby conditions,(4) and can be gradually accelerated to synchronous speed with generator voltage(3) ≥ 4106 volts and ≤ 4368 volts and frequency(3) ≥ 58.8 Hz and ≤ 61.2 Hz,

6. Verifying the generator is synchronized, loaded(5) to ≥ 1425 kw, and operates for ≥ 60 minutes, and

7. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

b. At least once per 18 months during shutdown by:

1. ~~Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,~~ (Deleted)

2. Verifying the generator capability to reject a load of ≥ 615 kw without tripping and without exceeding 66.2 Hz,(7)

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(3) The values for voltage and frequency are analysis values. These value bands shall be appropriately reduced to account for measurement uncertainties.

(4) All diesel generator starts may be followed by a warmup period prior to loading.

(5) Diesel generator loadings may include gradual loading as recommended by the manufacturer.

(7) The value for frequency shall be appropriately reduced to account for measurement uncertainties

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SURVEILLANCE REQUIREMENTS (Continued)

3. Simulating a loss of offsite power in conjunction with a safety injection signal, and:

   a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.

   b) Verifying the diesel starts from standby conditions on the auto-start signal, energizes the emergency busses with permanently connected loads in ≤ 10 seconds, energizes the auto-connected emergency loads through the load sequencer and operates for ≥ 5 minutes while its generator is loaded with the emergency loads. After energization of these loads, the steady state voltage(3) and frequency(3) shall be maintained at ≥ 4106 volts and ≤ 4368 volts, and ≥ 60.0 Hz and ≤ 60.4 Hz.

4. Verifying that on a loss of power to the emergency busses, all diesel generator trips, except engine overspeed, generator differential and overcurrent, are automatically disabled,

5. Verifying the diesel generator operates for ≥ 60 minutes while loaded to ≥ 2750 kw,

6. Verifying that the auto-connected loads to each diesel generator do not exceed the 2000 hour rating of 2850 kw, and

7. Verifying that the automatic load sequence timer is OPERABLE with each load sequence time within ± 10% of its required value.

c. Check for and remove accumulated water:

   1. From the day tank, at least once per 31 days and after each operation of the diesel where the period of operation was greater than 1 hour, and

   2. From the fuel oil storage tank, at least once per 92 days.

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(3) The values for voltage and frequency are analysis values. These value bands shall be appropriately reduced to account for measurement uncertainties.

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SURVEILLANCE REQUIREMENTS (Continued)

d. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:

1. By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:

a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees,

b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification,

c) A flash point equal to or greater than 125°F,

d) A water and sediment content of less than or equal to 0.05% when tested in accordance with ASTM D1796-83, and

e) A total particulate contamination level of less than 10 mg/liter when tested in accordance with ASTM D2276-78, Method A.

2. By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

e. At least once every 31 days by obtaining a sample of fuel oil from the storage tanks and day tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A.

Attachment A-2

Beaver Valley Power Station, Unit No. 2
Proposed Technical Specification Changes

License Amendment Request No. 176

The following is a list of the affected pages:

3/4 8-1
3/4 8-2
3/4 8-3
3/4 8-4

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generators each with:

1. Separate day tank containing a minimum of 350 usable gallons of fuel,

2. A separate fuel storage system containing a minimum of 53,225 usable gallons of fuel,

3. A separate fuel transfer pump,

4. Lubricating oil storage containing a minimum total volume of 504 gallons of lubricating oil, and

5. Capability to transfer lubricating oil from storage to the diesel generator unit.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one offsite circuit inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

b. With one diesel generator(1) inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the diesel

(1) Required actions may be delayed for up to 7 days if the diesel generator(s) is inoperable solely due to the ~~F~~fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e., ~~shall be brought within the specified limits within 7 days.~~

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

generator became inoperable due to any cause other than an independently testable component, testing or preplanned preventative maintenance, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.5 within 24 hours(2) unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated. Restore the diesel generator to OPERABLE status within ~~72 hours~~14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With one offsite circuit and one diesel generator(1) inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than an independently testable component, testing or preplanned preventative maintenance, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.5 within 8 hours(2) unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated. Restore one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Action Statement a or b, as appropriate with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable A.C. power source. A successful test of diesel OPERABILITY per Surveillance Requirement 4.8.1.1.2.a.5 performed under this Action Statement for an OPERABLE diesel or a restored to OPERABLE diesel satisfies the diesel generator test requirement of Action Statement b.

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(1) Required actions may be delayed for up to 7 days if the diesel generator(s) is inoperable solely due to the ~~F~~fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e. ~~shall be brought within the specified limits within 7 days.~~

(2) This action is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

d. With two of the required offsite A.C. circuits inoperable, restore one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Following restoration of one offsite source, follow Action Statement a with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable offsite A.C. circuit.

e. With two of the required diesel generators(1) inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Following restoration of one diesel generator unit, follow Action Statement b with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable diesel generator. A successful test of diesel OPERABILITY per Surveillance Requirement 4.8.1.1.2.a.5 performed under this Action Statement for a restored to OPERABLE diesel satisfies the diesel generator test requirement of Action Statement b.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignment, indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months by transferring (manually and automatically) unit power supply from the unit circuit to the system circuit.

(1) Required actions may be delayed for up to 7 days if the diesel generator(s) is inoperable solely due to the ~~F~~fuel oil contained in the storage tanks not meeting the properties in accordance with 4.8.1.1.2.d.2 or 4.8.1.1.2.e., ~~shall be brought within the specified limits within 7 days.~~

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day tank,

2. Verifying the fuel level in the fuel storage tank,

3. (Deleted)

4. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the day tank,

5. Verifying the diesel starts from standby conditions,(4) and achieves steady state voltage(3) of ≥ 3994 volts and ≤ 4368 volts and frequency(3) of ≥ 59.9 Hz and ≤ 60.3 Hz,

6. Verifying the generator is synchronized, loaded(5) to ≥ 4,238 kw, and operates for ≥ 60 minutes,

7. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses, and

8. Verifying the lubricating oil inventory in storage.

b. At least once per 18 months during shutdown by:

1. ~~Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,~~ (Deleted)

2. Verifying the generator capability to reject a load of ≥ 825 kw, without tripping and without exceeding 64.4 Hz(7)

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(3) The values for voltage and frequency are analysis values. These value bands shall be appropriately reduced to account for measurement uncertainties.

(4) All diesel generator starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.

(5) Diesel generator loadings may include gradual loading as recommended by the manufacturer.

(7) The value for frequency shall be appropriately reduced to account for measurement uncertainties

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SURVEILLANCE REQUIREMENTS (Continued)

3. Simulating a loss of offsite power in conjunction with a safety injection signal, and:

   a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.

   b) Verifying the diesel starts from standby conditions(6) on the auto-start signal, energizes the emergency busses with permanently connected loads in ≤ 10 seconds, energizes the auto-connected emergency loads through the load sequencer and operates for ≥ 5 minutes while its generator is loaded with the emergency loads. After energization of these loads, the steady state voltage(3) and frequency(3) shall be maintained at ≥ 3994 volts and ≤ 4368 volts, and ≥ 59.9 Hz and ≤ 60.3 Hz.

4. Verifying that on a loss of power to the emergency busses, all diesel generator trips, except engine overspeed, backup phase fault detection, generator differential current, and generator overexcitation are automatically disabled,

5. Verifying the diesel generator operates for ≥ 60 minutes while loaded to ≥ 4,238 kw,

6. Verifying that the auto-connected loads to each diesel generator do not exceed the 2000 hour rating of 4,535 kw, and

7. Verifying that the automatic load sequence timer is OPERABLE with each load sequence time within ±10% of its required value.

c. Check for and remove accumulated water:

   1. From the day tank, at least once per 31 days and after each operation of the diesel where the period of operation was greater than 1 hour, and

   2. From the fuel oil storage tank, at least once per 92 days.

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(3) The values for voltage and frequency are analysis values. These value bands shall be appropriately reduced to account for measurement uncertainties.

(6) All diesel generator starts may be preceded by an engine prelube period.

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SURVEILLANCE REQUIREMENTS (Continued)

d. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:

1. By verifying in accordance with the test specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:

a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees,

b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification,

c) A flash point equal to or greater than 125°F,

d) A water and sediment content of less than or equal to 0.05% when tested in accordance with ASTM D1796-83, and

e) A total particulate contamination level of less than 10 mg/liter when tested in accordance with ASTM D2276-78, Method A.

2. By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

e. At least once every 31 days by obtaining a sample of fuel oil from the storage tanks and day tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A.

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SURVEILLANCE REQUIREMENTS (Continued)

f. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting from standby conditions(6) both diesel generators simultaneously, during shutdown, and verifying that each diesel generator achieves:

1. in ≤ 10 seconds, voltage(8) ≥ 3994 volts and frequency(8) ≥ 59.9 Hz, and

2. steady state, voltage(3) ≥ 3994 volts and ≤ 4368 volts, and frequency(3) ≥ 59.9 Hz and ≤ 60.3 Hz.

g. At least once per 10 years by draining each main fuel oil storage tank, removing the accumulated sediment, and cleaning the tank using a sodium hypochlorite solution or other appropriate cleaning solution.

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(3) The values for voltage and frequency are analysis values. These value bands shall be appropriately reduced to account for measurement uncertainties.

(6) All diesel generator starts may be preceded by an engine prelube period.

(8) The values for voltage and frequency are analysis values. These values shall be appropriately increased to account for measurement uncertainties.

Attachment B-1

Beaver Valley Power Station, Unit No. 1

Proposed Technical Specification Bases Changes

License Amendment Request No. 306

The following is a list of the affected pages:

B 3/4 0-4
B 3/4 8-1
B 3/4 8-3

Specification 3.0.5 This specification delineates what additional conditions must be satisfied to permit operation to continue, consistent with the ACTION statements for power sources, when a normal or emergency power source is not OPERABLE. It specifically prohibits operation when one division is inoperable because its normal or emergency power source is inoperable and a system, subsystem, train, component or device in another division is inoperable for another reason.

The provisions of this specification permit the ACTION statements associated with individual systems, subsystems, trains, components, or devices to be consistent with the ACTION statements of the associated electrical power source. It allows operation to be governed by the time limits of the ACTION statement associated with the Limiting Condition For Operation for the normal or emergency power source, not the individual ACTION statements for each system, subsystem, train, component or device that is determined to be inoperable solely because of the inoperability of its normal or emergency power source.

For example, Specification 3.8.1.1 requires in part that two emergency diesel generators be OPERABLE. The ACTION statement provides for a ~~72-hour~~14 day out-of-service time when one emergency diesel generator is not OPERABLE. If the definition of OPERABLE were applied without consideration of Specification 3.0.5, all systems subsystems, trains, components and devices supplied by the inoperable emergency power source would also be inoperable. This would dictate invoking the applicable ACTION statements for each of the applicable Limiting Conditions for Operation. However, the provisions of Specification 3.0.5 permit the time limits for continued operation to be consistent with the ACTION statement for the inoperable emergency diesel generator instead, provided the other specified conditions are satisfied. In this case, this would mean that the corresponding normal power source must be OPERABLE, and all redundant systems, subsystems, trains, components, and devices must be OPERABLE, or otherwise satisfy Specification 3.0.5 (i.e., be capable of performing their design function and have at least one normal or one emergency power source OPERABLE). If they are not satisfied, action is required in accordance with this specification.

As a further example, Specification 3.8.1.1 requires in part that two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system be OPERABLE. The ACTION statement provides a 24-hour out-of-service time when both required offsite circuits are not OPERABLE. If the definition of OPERABLE were applied without consideration of Specification 3.0.5, all systems, subsystems, trains, components and devices supplied by the inoperable normal power sources, both of the offsite circuits, would also be inoperable. This would dictate invoking the applicable ACTION statement for the inoperable normal power sources instead, provided the other specified conditions are satisfied. In this case, this would mean that for one division the emergency power source must be OPERABLE (as must be the components supplied by the emergency power source) and all redundant systems, subsystems, trains

BASES

3/4.8.1, 3/4.8.2 A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix "A" to 10 CFR 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

The ACTION statements for inoperable AC Sources provides a 14 day allowable out of service time when one diesel generator is inoperable. This risk informed allowed outage time (AOT)is based on a plant specific risk analysis performed to establish this AOT.

The ACTION requirements specified in LCOs 3.8.1.2, 3.8.2.2, and 3.8.2.4 address the condition where sufficient power is unavailable to recover from postulated events (i.e. fuel handling accident). Implementation of the ACTION requirements shall not preclude completion of actions to establish a safe conservative plant condition. Completion of the requirements will prevent the occurrence of postulated events for which mitigating actions would be required.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods, 2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and 3) sufficient power is available for systems (i.e. Control Room Ventilation System) necessary to recover from postulated events in these MODES, e.g. a fuel handling accident.

In Modes 1 through 4, the specified quantity of 17,500 usable gallons required in each storage tank (35,000 total gallons) ensures a sufficient volume of fuel oil that, when added to the specified 900 usable gallon volume in the day and engine-mounted tanks, provides the fuel oil necessary to support a minimum of 7 days continuous operation of one diesel generator at full load (UFSAR Sections 8.5.2 and 9.14). The total volume in each of the tanks is

greater due to the tank's physical characteristics.

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS
(Continued)

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 3.8-1 is permitted for up to 7 days. During this 7 day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than .020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than .040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

Note (1) permits the required actions~~provides clarification~~ of Specification 3.8.1.1 to be delayed for up to 7 days~~action requirements~~ when the diesel generators are inoperable solely as a result of Surveillance Requirements 4.8.1.1.2.d.2 and 4.8.1.1.2.e. This 7 day delay period provides time to restore the fuel oil contained in the diesel generator fuel oil storage tanks back to within specified limits prior to applying the action requirements and specified completion times for the applicable action statement. This delay period is in accordance with Regulatory Guide 1.137 Revision 1 Regulatory Position C.2.a.

For the purposes of SR 4.8.1.1.2.a.5 and SR 4.8.1.1.2.b.3.b testing, the diesel generators are started from standby conditions. Standby conditions for a diesel generator mean that the diesel engine oil is being continuously circulated and engine coolant and oil temperatures are being maintained consistent with manufacturer recommendations.

The frequency of 66.2 Hz specified in Surveillance Requirement 4.8.1.1.2.b.2 corresponds to 993 rpm.

Attachment B-2

Beaver Valley Power Station, Unit No. 2

Proposed Technical Specification Bases Changes

License Amendment Request No. 176

The following is a list of the affected pages:

B 3/4 0-4
B 3/4 8-1
B 3/4 8-3

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Specification 3.0.5 This specification delineates what additional conditions must be satisfied to permit operation to continue, consistent with the ACTION statements for power sources, when a normal or emergency power source is not OPERABLE. It specifically prohibits operation when one division is inoperable because its normal or emergency power source is inoperable and a system, subsystem, train, component or device in another division is inoperable for another reason.

The provisions of this specification permit the ACTION statements associated with individual systems, subsystems, trains, components, or devices to be consistent with the ACTION statements of the associated electrical power source. It allows operation to be governed by the time limits of the ACTION statement associated with the Limiting Condition for Operation for the normal or emergency power source, not the individual ACTION statements for each system, subsystem, train, component or device that is determined to be inoperable solely because of the inoperability of its normal or emergency power source.

For example, Specification 3.8.1.1 requires in part that two emergency diesel generators be OPERABLE. The ACTION statement provides for a ~~72 hour~~14 day out-of-service time when one emergency diesel generator is not OPERABLE. If the definition of OPERABLE were applied without consideration of Specification 3.0.5, all system subsystems, trains, components and devices supplied by the inoperable emergency power source would also be inoperable. This would dictate invoking the applicable ACTION statements for each of the applicable Limiting Conditions for Operation. However, the provisions of Specification 3.0.5 permit the time limits for continued operation to be consistent with the ACTION statement for the inoperable emergency diesel generator instead, provided the other specified conditions are satisfied. In this case, this would mean that the corresponding normal power source must be OPERABLE, and all redundant systems, subsystems, trains, components, and devices must be OPERABLE, or otherwise satisfy Specification 3.0.5 (i.e, be capable of performing their design function and have at least one normal or one emergency power source OPERABLE). If they are not satisfied, action is required in accordance with this specification.

As a further example, Specification 3.8.1.1 requires in part that two physically independent circuits between the offsite transmission network and the onsite Class IE distribution system be OPERABLE. The ACTION statement provides a 24-hour out-of-service time when both required offsite circuits are not OPERABLE. If the definition of OPERABLE were applied without consideration of Specification 3.0.5, all systems, subsystems, trains, components and devices supplied by the inoperable normal power sources, both of the offsite circuits, would also be inoperable. This would dictate invoking the applicable ACTION statement for the inoperable normal power sources instead, provided the other specified conditions are satisfied. In this case, this would mean that for one division the emergency power source must be OPERABLE (as must be the components supplied by the emergency power source) and all redundant systems, subsystems,

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BASES

3/4.8.1, 3/4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix "A" to 10 CFR 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

The ACTION statements for inoperable AC Sources provides a 14 day allowable out of service time when one diesel generator is inoperable. This risk informed allowed outage time (AOT)is based on a plant specific risk analysis performed to establish this AOT.

The ACTION requirements specified in LCOs 3.8.1.2, 3.8.2.2, and 3.8.2.4 address the condition where sufficient power is unavailable to recover from postulated events, such as a fuel handling accident involving recently irradiated fuel. Due to radioactive decay, electrical power is only required to mitigate fuel handling accidents involving recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 100 hours). Implementation of the ACTION requirements shall not preclude completion of actions to establish a safe conservative plant condition. Completion of the requirements will prevent the occurrence of postulated events for which mitigating actions would be required.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and 3) sufficient power is available for systems that may be necessary to recover from postulated events in these MODES, e.g., a fuel handling accident involving recently irradiated fuel.

Provided for Information Only.

BASES

3/4.8.1, 3/4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION
(Continued)

Table 3.8-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 3.8-1 is permitted for up to 7 days. During this 7 day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; 3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and 4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

Note (1) permits the required actions~~provides clarification~~ of Specification 3.8.1.1 to be delayed for up to 7 days~~Action requirements~~ when the diesel generators are inoperable solely as a result of Surveillance Requirements 4.8.1.1.2.d.2 and 4.8.1.1.2.e. This 7 day delay period provides time to restore the fuel oil contained in the diesel generator fuel oil storage tanks back to within specified limits prior to applying the action requirements and specified completion times for the applicable action statement. This delay period is in accordance with Regulatory Guide 1.137, Revision 1, Position C.2.a.

For the purposes of SR 4.8.1.1.2.a.5, 4.8.1.1.2.b.3.b and 4.8.1.1.2.f testing, the diesel generators are started from standby conditions. Standby conditions for a diesel generator mean that the diesel engine coolant and oil are being continuously circulated and temperatures are being maintained consistent with manufacturer recommendations.

The frequency of 64.4 Hz specified in Surveillance Requirement 4.8.1.1.2.b.2 corresponds to 552 rpm.

Change ~~Amendment~~ No. ~~121~~

Attachment C

Beaver Valley Power Station, Unit Nos. 1 and 2

Commitment Summary

License Amendment Request Nos. 306 (Unit 1) and 176 (Unit 2)

[redacted]

Commitment List

The following table 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 FENOC. They are described only as information and are not regulatory commitments. Please notify Mr. Larry R. Freeland, Manager, Regulatory Affairs/Performance Improvement, at Beaver Valley on (724) 682-5284 of any questions regarding this document or associated regulatory commitments.

COMMITMENT	DUE DATE
1. The BVPS Unit 1 and Unit 2 UFSARs will be revised to include the following statement: "The emergency diesel generators are periodically inspected in accordance with a licensee controlled maintenance program. The emergency diesel generator maintenance program specifies required inspections based on the manufacturer's and Diesel Generator Owner's Group recommendations and industry operating experience. Changes to the emergency diesel generator maintenance program are controlled under 10 CFR 50.59."	Amendment Implementation
2. The BVPS Unit 2 UFSAR description of conformance to Regulatory Guide 1.93 will be revised to include exceptions to the guidance concerning a 72 hour allowed outage time (AOT) for restoring an inoperable EDG and avoidance of this AOT for preventive maintenance.	Amendment Implementation

COMMITMENT	DUE DATE
3. 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 for scheduled maintenance: • If either offsite power circuit is unavailable, an EDG will be removed from service only for corrective maintenance, i.e., maintenance required to restore operability. • If an EDG is unavailable, the offsite power circuits will be removed from service only for corrective maintenance required to restore operability. • An EDG will not be removed from service for scheduled maintenance unless both of the opposite unit's EDG are available. • An EDG will not be removed from service for scheduled maintenance unless the Station Blackout cross-tie circuits between the units are available. • If an EDG is unavailable, an EDG on the opposite unit will be removed from service only for corrective maintenance, (i.e., maintenance required to ensure or restore operability) or for the performance of required surveillance testing. • If an EDG is unavailable, the station blackout cross-tie will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability. • An EDG will not be removed from service for scheduled maintenance if weather forecasts are predicting severe weather conditions for the BVPS area with the potential to degrade or limit offsite power availability.	Amendment Implementation

COMMITMENT	DUE DATE
• 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. • 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.	
4. The BVPS administrative procedures for implementing Section (a)(4) of the Maintenance Rule will be revised to reflect the following compensatory measure: • Prior to entering the 14 day EDG AOT for scheduled maintenance and within 24 hours after entering the 14 day EDG AOT for unscheduled corrective maintenance (maintenance required to restore operability) an hourly fire watch will be established in the EDG room for the operable EDG.	Amendment Implementation