

Mr. L. W. Myers  
 Senior Vice President  
 Beaver Valley Power Station  
 Post Office Box 4  
 Shippingport, PA 15077

February 11, 2000

Template NRR-058

**SUBJECT: BEAVER VALLEY 1 AND 2 - AMENDMENT FOR REVISED TECHNICAL SPECIFICATION REQUIREMENTS FOR EMERGENCY DIESEL GENERATORS (TAC NOS. MA4438 AND MA4439)**

Dear Mr. Myers:

The Commission has issued the enclosed Amendment No. 227 to Facility Operating License No. DPR-66 and Amendment No. 105 to Facility Operating License No. NPF-73 for the Beaver Valley Power Station, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to the application dated December 24, 1998, as supplemented January 6, 1999, filed by Duquesne Light Company, as the then licensee for Beaver Valley, which submitted License Amendment Request Nos. 258 and 129.

These amendments change the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2) TSs to ensure that Emergency Diesel Generator (EDG) requirements contained in TS 3/4.8.1 for both units are consistent with assumptions contained in design analyses and requirements of plant procedures. Revisions to TS 3/4.8.1, "A.C. Sources," contained in these amendments provide more conservative limiting conditions for operation (LCO) and surveillance requirements that affect EDG fuel oil storage volume, EDG load rejection and overspeed testing, and EDG operating frequency requirements. The applicable bases for each unit are also refined, as necessary, to strengthen the explanations regarding EDG fuel oil storage systems and provide the EDG overspeed in terms of frequency (Hertz) and speed (Revolutions Per Minute).

A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

/RA/

Daniel S. Collins, Project Manager, Section 1  
 Project Directorate I  
 Division of Licensing Project Management  
 Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

- Enclosures: 1. Amendment No.227 to DPR-66  
 2. Amendment No.105 to NPF-73  
 3. Safety Evaluation

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cc w/encls: See next page

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\* See previous concurrence

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 11, 2000

Mr. L. W. Myers  
Senior Vice President  
Beaver Valley Power Station  
Post Office Box 4  
Shippingport, PA 15077

**SUBJECT: BEAVER VALLEY 1 AND 2 - AMENDMENT FOR REVISED TECHNICAL SPECIFICATION REQUIREMENTS FOR EMERGENCY DIESEL GENERATORS (TAC NOS. MA4438 AND MA4439)**

Dear Mr. Myers:

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These amendments change the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2) TSs to ensure that Emergency Diesel Generator (EDG) requirements contained in TS 3/4.8.1 for both units are consistent with assumptions contained in design analyses and requirements of plant procedures. Revisions to TS 3/4.8.1, "A.C. Sources," contained in these amendments provide more conservative limiting conditions for operation (LCO) and surveillance requirements that affect EDG fuel oil storage volume, EDG load rejection and overspeed testing, and EDG operating frequency requirements. The applicable bases for each unit are also refined, as necessary, to strengthen the explanations regarding EDG fuel oil storage systems and provide the EDG overspeed in terms of frequency (Hertz) and speed (Revolutions Per Minute).

A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

A handwritten signature in black ink, appearing to read "Daniel S. Collins", written over a horizontal line.

Daniel S. Collins, Project Manager, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosures: 1. Amendment No. 227 to DPR-66  
2. Amendment No. 105 to NPF-73  
3. Safety Evaluation

cc w/encls: See next page

**Beaver Valley Power Station, Units 1 and 2**

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UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-334

BEAVER VALLEY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 227  
License No. DPR-66

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by FirstEnergy Nuclear Operating Company, et al. (the licensee) dated December 24, 1998, as supplemented January 6, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-66 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.227, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Marsha Gamberoni, Acting Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: February 11, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 227

FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Replace the following pages of Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

<u>Remove</u>	<u>Insert</u>
3/4 8-1	3/4 8-1
3/4 8-4	3/4 8-4
3/4 8-4a	3/4 8-4a
3/4 8-5	3/4 8-5
B 3/4 8-1	B 3/4 8-1
B 3/4 8-2	B 3/4 8-2
B 3/4 8-3	B 3/4 8-3
-----	B 3/4 8-4

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

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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<sup>(1)</sup> 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

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(1) 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, <sup>(4)</sup> and can be gradually accelerated to synchronous speed with generator voltage <sup>(3)</sup>  $\geq 4106$  volts and  $\leq 4368$  volts and frequency <sup>(3)</sup>  $\geq 58.8$  Hz and  $\leq 61.2$  Hz,
6. Verifying the generator is synchronized, loaded <sup>(5)</sup> to  $\geq 1425$  kw, and operates for  $\geq 60$  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,
2. Verifying the generator capability to reject a load of  $\geq 615$  kw, <sup>(7)</sup> without tripping and without exceeding 66.2 Hz,

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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

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  $\leq 10$  seconds, energizes the auto-connected emergency loads through the load sequencer and operates for  $\geq 5$  minutes while its generator is loaded with the emergency loads. After energization of these loads, the steady state voltage<sup>(3)</sup> and frequency<sup>(3)</sup> shall be maintained at  $\geq 4106$  volts<sup>(6)</sup> and  $\leq 4368$  volts, and  $\geq 60.0$  Hz and  $\leq 60.6$  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  $\geq 60$  minutes while loaded to  $\geq 2750$  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  $\pm 10\%$  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) The frequency limits apply for the diesel generator at full accident loading. An engineering evaluation of the test data at lower loads can be performed to demonstrate operability.

DPR-66  
ELECTRICAL POWER SYSTEMS

SHUTDOWN

LIMITING CONDITION FOR OPERATION

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

- a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and
- b. One diesel generator with:
  1. Day and engine-mounted fuel tanks containing a minimum of 900 usable gallons of fuel,
  2. A fuel storage system containing a minimum of 17,500 usable gallons of fuel, and
  3. A fuel transfer pump.

APPLICABILITY: MODES 5 and 6, AND

During movement of irradiated fuel  
with no fuel assemblies in the reactor vessel, and

During movement of loads over irradiated fuel  
with no fuel assemblies in the reactor vessel.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, and movement of loads over irradiated fuel until the minimum required A.C. electrical power sources are restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

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4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1 and 4.8.1.1.2 except for requirement 4.8.1.1.2.a.6.

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 requirements specified in MODES 5 and 6 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. Supplemental Leak Collection and Release 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.

DPR-66  
ELECTRICAL POWER SYSTEMS

BASES

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

In Modes 1 through 4, the specified fuel oil volumes of both fuel oil storage tanks are required to ensure 7 days continuous operation of a single diesel generator at full load. Should the quantity of fuel oil in either fuel oil storage tank or either day and engine-mounted tank fall below the amount required in the technical specifications, the technical specification Action Statement for the associated diesel generator is applicable and provides adequate assurance that fuel oil is restored to within the required limit(s) in a timely manner.

In Modes 5 and 6, a single diesel generator with 900 usable gallons of fuel oil in the day and engine-mounted tank and a single fuel oil storage tank with 17,500 usable gallons are required operable. These requirements ensure the capability to support the systems required during a loss of offsite power when the plant is in a cold shutdown or refueling condition.

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

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 .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 .020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than .010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

DPR-66  
ELECTRICAL POWER SYSTEMS

BASES

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) provides clarification of Specification 3.8.1.1 action requirements when the diesel generators are inoperable as a result of Surveillance Requirements 4.8.1.1.2.d.2 and 4.8.1.1.2.e 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.

Footnote (6) permits an engineering evaluation to be performed if the frequency limits of SR 4.8.1.1.2.b.3.b are not met. The frequency limits prescribed in SR 4.8.1.1.2.b.3.b are based on full load conditions. Since SR 4.8.1.1.2.b.3.b is normally performed at less than full loading conditions, the resultant generator frequency may exceed the required frequency value range due to the design of the diesel generator governor, especially during lower loading. Under these conditions, it is acceptable to examine the frequency response vs. loading and by an engineering evaluation, determine that the governor is responding properly and would fall within the required frequency band while at full accident loading. The engineering evaluation consists of comparing previous voltage, frequency and power plots with the current plots of these same parameters. By comparing the above data, proper governor response can be verified. Based on governor response and the current governor droop setting, the frequency value obtained during performance of SR 4.8.1.1.2.b.3.b can be evaluated to ensure the frequency limits of SR 4.8.1.1.2.b.3.b at full accident loading would be met.

DPR-66  
ELECTRICAL POWER SYSTEMS

BASES

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

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



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 105  
License No. NPF-73

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by FirstEnergy Nuclear Operating Company, et al. (the licensee) dated December 24, 1998, as supplemented January 6, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-73 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 105 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Marsha Gamberoni, Acting Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: February 11, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 105

FACILITY OPERATING LICENSE NO. NPF-73

DOCKET NO. 50-412

Replace the following pages of Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

<u>Remove</u>	<u>Insert</u>
3/4 8-1	3/4 8-1
3/4 8-4	3/4 8-4
3/4 8-5	3/4 8-5
3/4 8-5a	3/4 8-5a
3/4 8-5b	3/4 8-5b
3/4 8-6	3/4 8-6
B 3/4 8-2	B 3/4 8-2
B 3/4 8-3	B 3/4 8-3

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

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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<sup>(1)</sup> 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

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(1) 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, <sup>(4)</sup> and achieves steady state voltage <sup>(3)</sup> of  $\geq 3994$  volts and  $\leq 4368$  volts and frequency <sup>(3)</sup> of  $\geq 59.9$  Hz and  $\leq 60.3$  Hz,
  6. Verifying the generator is synchronized, loaded <sup>(5)</sup> to  $\geq 4,238$  kw, and operates for  $\geq 60$  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,
  2. Verifying the generator capability to reject a load of  $\geq 825$  kw, without tripping and without exceeding 64.4 Hz

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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

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<sup>(6)</sup> on the auto-start signal, energizes the emergency busses with permanently connected loads in  $\leq 10$  seconds, energizes the auto-connected emergency loads through the load sequencer and operates for  $\geq 5$  minutes while its generator is loaded with the emergency loads. After energization of these loads, the steady state voltage<sup>(3)</sup> and frequency<sup>(3)</sup> shall be maintained at  $\geq 3994$  volts and  $\leq 4368$  volts, and  $\geq 59.9$  Hz and  $\leq 60.3$  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  $\geq 60$  minutes while loaded to  $\geq 4,238$  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  $\pm 10\%$  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.

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.

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<sup>(6)</sup> both diesel generators simultaneously, during shutdown, and verifying that each diesel generator achieves, in  $\leq 10$  seconds<sup>(3)</sup> voltage<sup>(3)</sup>  $\geq 3994$  volts and  $\leq 4368$  volts, and frequency<sup>(3)</sup>  $\geq 59.9$  Hz and  $\leq 60.3$  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.

NPF-73  
ELECTRICAL POWER SYSTEMS

SHUTDOWN

LIMITING CONDITION FOR OPERATION

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

- a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and
- b. One diesel generator with:
  1. Day tank containing a minimum of 350 usable gallons of fuel,
  2. A fuel storage system containing a minimum of 53,225 usable gallons of fuel,
  3. A fuel transfer pump.

APPLICABILITY: MODES 5 and 6, AND

During movement of irradiated fuel  
with no fuel assemblies in the reactor vessel, and

During movement of loads over irradiated fuel  
with no fuel assemblies in the reactor vessel.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, and movement of loads over irradiated fuel until the minimum required A.C. electrical power sources are restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1 and 4.8.1.1.2 except for requirement 4.8.1.1.2.a.6.

BASES3/4.8.1, 3/4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION  
(Continued)

Appendix A to Generic Letter 84-15 and Generic Letter 83-26, "Clarification of Surveillance Requirements for Diesel Fuel Impurity Level Tests."

The quantity of 350 usable gallons in the day tank represents the analytical value of fuel necessary to run the diesel for at least 60 minutes at a load of 100% of continuous rating plus a minimum margin of 10% in accordance with ANSI N195 - 1976 which is referenced in Regulatory Guide 1.137 Rev. 1. The total tank volume is greater due to the tank's physical characteristics.

The quantity of 53,225 usable gallons is the analytical value required in the fuel storage tank that, when added to the 350 gallons, makes up the fuel necessary to support a minimum of 7 days continuous EDG operation at its rated load. This is in compliance with Regulatory Guide 1.137, Rev. 1. The total volume in this tank is greater due to the tank's physical characteristics.

The Surveillance Requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

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.

BASES3/4.8.1, 3/4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION  
(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 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) provides clarification of Specification 3.8.1.1 Action requirements when the diesel generators are inoperable as a result of Surveillance Requirements 4.8.1.1.2.d.2 and 4.8.1.1.2.e 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.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NOS. 227 AND 105 TO FACILITY OPERATING  
LICENSE NOS. DPR-66 AND NPF-73  
PENNSYLVANIA POWER COMPANY  
OHIO EDISON COMPANY  
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY  
THE TOLEDO EDISON COMPANY  
FIRSTENERGY NUCLEAR OPERATING COMPANY  
BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-334 AND 50-412

1.0 INTRODUCTION

By letter dated December 24, 1998, as supplemented January 6, 1999, the Duquesne Light Company (DLC) submitted a request for changes to the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2), Technical Specifications (TSs). The requested changes would revise the BVPS-1 and BVPS-2 TSs to ensure that Emergency Diesel Generator (EDG) requirements contained in TS 3/4.8.1 for both units are consistent with assumptions contained in design analyses and provisions of plant procedures. Revisions to TS 3/4.8.1, "A.C. Sources," contained in these amendments provide more conservative limiting conditions for operation (LCOs) and surveillance requirements (SRs) that affect EDG fuel oil storage volume, EDG load rejection and overspeed testing, and EDG operating frequency requirements. The applicable TS Bases for each unit are also refined, as necessary, to strengthen the explanations regarding EDG fuel oil storage systems and provide the EDG overspeed in terms of frequency (Hertz, Hz) and speed (Revolutions Per Minute, RPM). The January 6, 1999, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination or expand the amendment request beyond the scope of the January 27, 1999, Federal Register notice.

On the dates of these letters, DLC was the licensed operator for BVPS-1 and BVPS-2. On December 3, 1999, DLC's ownership interests in both BVPS-1 and BVPS-2 were transferred to the Pennsylvania Power Company (Penn Power), and DLC's operating authority for BVPS-1 and BVPS-2 was transferred to FirstEnergy Nuclear Operating Company (FENOC). By letter dated December 13, 1999, FENOC requested that the Nuclear Regulatory Commission (NRC) continue to review and act upon all requests before the NRC which had been submitted by DLC.

## 2.0 EVALUATION

### 2.1 EDG Fuel Oil Storage Volume

The BVPS-1 and BVPS-2 design and safety analyses for diesel fuel storage capacity are based upon having sufficient volume for 7 days of continuous operation of the EDGs under maximum load conditions. TS 3.8.1.2 (Unit 1) and 3.8.1.1 (Unit 2) specify the minimum contained volume of fuel in the EDG day, engine-mounted, and fuel storage tanks. However, due to the configuration of the storage tanks and the fuel oil system piping, they also contain a volume of unusable fuel. The licensee has implemented interim administrative controls to ensure the volume of usable fuel within the tanks will support continuous operation of the EDGs for 7 days. The licensee has now proposed to revise TS 3.8.1.2 (Unit 1) and 3.8.1.1 (Unit 2) to clarify that the fuel volumes specified in these TSs must be useable volumes. The NRC staff has reviewed the licensee's proposed changes to TS 3.8.1.2 (Unit 1) and 3.8.1.1 (Unit 2) and has concluded that the proposed changes clarify that the required volumes of fuel in the EDG day, engine-mounted, and fuel storage tanks are useable volumes. These changes are consistent with the BVPS-1 and BVPS-2 design and safety analyses and will ensure the tanks will support continuous operation of the EDGs for 7 days. Therefore, the proposed changes to TS 3.8.1.2 (Unit 1) and 3.8.1.1 (Unit 2) are acceptable.

In addition to the proposed changes to TS 3.8.1.2 (Unit 1) and 3.8.1.1 (Unit 2), the licensee proposed changes to the associated TS Bases to provide additional information regarding the amount of diesel fuel required for each unit. The NRC staff has no objection to these proposed TS Bases changes.

### 2.2 EDG Single Largest Load Rejection and Overspeed Verification During Surveillance Testing

Each EDG is provided with an engine overspeed trip to prevent damage to the engine which might result from operation at excessive speeds. A transient caused by the loss of a large load could cause the EDG speed to increase to the overspeed trip setpoint and trip the engine.

SR 4.8.1.1.2.b.2 demonstrates the ability of the EDG to reject the largest single load without tripping. Regulatory Guide (RG) 1.9, dated December 1979, provides guidance that during recovery from transients resulting from "the disconnection of the largest single load, the speed of the diesel generator unit should not exceed the nominal speed plus 75 percent of the difference between nominal speed and the overspeed trip setpoint or 115 percent of nominal, whichever is lower." The licensee identified that, for BVPS-1, the 450 kW specified in SR 4.8.1.1.2.b.2 for the load to be rejected is non-conservative. An engineering evaluation was performed which determined that the single largest load for BVPS-1 would be the brake horsepower value of 612 kW for the high head safety injection (HHSI) pump operating at a frequency of 61 Hz. The licensee has now proposed to revise SR 4.8.1.1.2.b.2 to verify the BVPS-1 EDG capability to reject a 615 kW load without tripping. The licensee stated that they have performed field verification tests that demonstrated the BVPS-1 EDGs are capable of rejecting  $\geq 700$  kW without tripping.

In addition to the proposed revision to the largest single load to be rejected for BVPS-1, the licensee has proposed revision of SR 4.8.1.1.2.b.2 for both BVPS-1 and BVPS-2 to include criteria for maximum frequency that should not be exceeded after load rejection. Based on the guidance of RG 1.9 these are 66.2 Hz for BVPS-1 and 64.4 Hz for BVPS-2. The difference in these frequencies is due to the fact that the BVPS-1 EDGs have a different manufacturer, and, hence, different operating characteristics, than those for BVPS-2. The BVPS-1 and BVPS-2 SR 4.8.1.1.2.b.2 do not currently specify any maximum EDG frequency criteria for the load rejection test.

The NRC staff has reviewed the licensee's proposed changes to the BVPS-1 and 2 SRs 4.8.1.1.2.b.2 and determined that the proposed changes are more conservative and consistent with the guidelines of RG 1.9. Since the licensee has verified through testing that the BVPS-1 EDGs are capable of rejecting loads in excess of 700 kW without tripping, the proposed changes should not lead to declaring an EDG inoperable when the EDG is still capable of performing the design basis function. Similarly, the addition of the maximum EDG frequency criteria to the SRs ensures that the rejection of load will not interfere with the successful functioning of the EDG to supply power to other safety equipment when it is most needed. Therefore, the proposed changes to BVPS-1 and 2 SRs 4.8.1.1.2.b.2 are acceptable.

In addition to the proposed changes to SR 4.8.1.1.2.b.2, the licensee proposed changes to the associated TS Bases to provide the EDG engine speed in RPM which corresponds to the frequency specified in the SR. Because the diesel engine is directly coupled to the generator, the generator output frequency is directly proportional to the engine speed in RPM. The NRC staff has no objection to these proposed TS Bases changes.

### 2.3 EDG Operating Frequency

The licensee discovered a discrepancy between the BVPS-1 TS EDG frequency limits and the assumptions of an engineering analysis for the HHSI pumps during safety injection. The licensee then performed engineering evaluations of the EDG operating frequencies specified in BVPS-1 and BVPS-2 SRs 4.8.1.1.2.a.5, 4.8.1.1.2.b.3.b, and BVPS-2 SR 4.8.1.1.2.f to evaluate the adequacy of, and effects on, system and component operations.

#### 2.3.1 BVPS-1 EDG Operating Frequency

The BVPS-1 EDGs' governor and control systems operate to provide a speed droop characteristic such that EDG output frequency decreases as load increases. This characteristic is present regardless of whether the EDG is paralleled to the grid or independently supporting the emergency bus. The present governor and control systems cannot be adjusted or operated to provide isochronous operation with zero droop.

During the performance of SR 4.8.1.1.2.a.5, the EDG is started from stand-by, the speed is manually increased to 900 RPM, the generator is manually field flashed to obtain output voltage, and the generator is then synchronized and paralleled to the grid. Once paralleled to the grid, the grid frequency controls generator frequency. The purpose of this surveillance is to demonstrate the ability of the EDG to start, be manually brought to synchronous speed, and accept load. This surveillance is not intended to demonstrate, or simulate, the "fast start" performance of the EDG; that is demonstrated by SR 4.8.1.1.2.b.3.b. Hence, the licensee did not request any changes to the EDG frequency requirements specified in SR 4.8.1.1.2.a.5.

The minimum and maximum EDG frequency values specified in BVPS-1 SR 4.8.1.1.2.b.3.b, are derived from recommendations found in RG 1.9. The lower frequency limit is necessary to ensure that the Loss-of-Coolant Accident (LOCA) analysis assumptions regarding emergency core cooling system (ECCS) pump flowrates are met. The upper frequency limit, on the other hand, is established to minimize the potential for pump run-out, prevent equipment from being operated in unanalyzed conditions, and prevent overloading the EDG.

The licensee determined that the current EDG allowable frequency band of  $\geq 58.8$  Hz and  $\leq 61.2$  Hz should be changed to  $\geq 60.0$  Hz and  $\leq 60.6$  Hz in order to conform to the assumptions of the HHSI analysis, and avoid overloading the EDG. The licensee also implemented, without difficulty, interim administrative controls and has proposed changes to BVPS-1 TS SR 4.8.1.1.2.b.3.b to reflect the more restrictive allowable frequency band. The NRC staff has reviewed these proposed changes and determined that the proposed requirements are more conservative and consistent with the guidelines of RG 1.9. The licensee's ability to comply with the more restrictive frequency band implemented via their administrative controls demonstrates that the proposed changes should not lead to declaring an EDG inoperable when it is still capable of performing the design basis function. Therefore, the proposed changes to BVPS-1 SR 4.8.1.1.2.b.3.b are acceptable.

### 2.3.2 BVPS-2 EDG Operating Frequency

The BVPS-2 EDGs have two modes of operation for the governor controls: the isochronous mode that maintains frequency when the EDG alone is powering the bus (i.e. the bus is not parallel to the grid) and the droop mode which, by providing additional flexibility in the frequency control band, allows the EDG to be paralleled to the grid. The governor controls operate such that speed droop is automatically removed when the EDG is not operating connected to the grid and automatically initiated when connected to the grid. Unlike the BVPS-1 EDGs, when a BVPS-2 EDG is started manually, the engine initially obtains full engine speed of approximately 514 rpm by automatic action of the governor, and the generator field is automatically flashed to obtain an output voltage.

The licensee determined that the current EDG allowable frequency band of  $\geq 58.8$  Hz and  $\leq 61.2$  Hz specified in BVPS-2 SRs 4.8.1.1.2.a.5, 4.8.1.1.2.b.3.b, and 4.8.1.1.2.f should be changed to  $\geq 59.9$  Hz and  $\leq 60.3$  Hz in order to conform to the assumptions of the HHSI analysis, prevent equipment from being operated in unanalyzed conditions, and avoid overloading the EDG. The licensee also implemented, without difficulty, interim administrative controls and has proposed changes to BVPS-2 SRs 4.8.1.1.2.a.5, 4.8.1.1.2.b.3.b, and 4.8.1.1.2.f to reflect the more restrictive allowable frequency band. The NRC staff has reviewed these proposed changes and determined that the proposed requirements are more conservative and consistent with the guidelines of RG 1.9. The licensee's ability to comply with the more restrictive frequency band implemented via their administrative controls demonstrates that the proposed changes should not lead to declaring an EDG inoperable when it is still capable of performing the design basis function. Therefore, the proposed changes to BVPS-2 SRs 4.8.1.1.2.a.5, 4.8.1.1.2.b.3.b, and 4.8.1.1.2.f are acceptable.

### **3.0 STATE CONSULTATION**

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

### **4.0 ENVIRONMENTAL CONSIDERATION**

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (64 FR 4154). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

### **5.0 CONCLUSION**

The Commission has concluded, based on the considerations discussed above, that: (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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: D. Collins

Date: February 11, 2000