

September 8, 1986

DCR 016

Docket Nos. 50-317  
and 50-318

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EButcher

Mr. J. A. Tiernan  
Vice President - Nuclear Energy  
Baltimore Gas & Electric Company  
P. O. Box 1475  
Baltimore, Maryland 21203

Dear Mr. Tiernan:

The Commission has issued the enclosed Amendment Nos. 121 and 103 to Facility Operating License Nos. DPR-53 and DPR-69 for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications in response to your application dated August 1, 1986 as supplemented by your letter dated August 25, 1986. During this review process, minor changes were made to LCO 3.8.1.1.a.2 and to the numbering of the surveillance requirements of surveillance 4.8.1.1.2 for the purpose of clarification. These changes were made with the consent of your staff.

The amendments temporarily change Technical Specification (TS) 3/4.8.1, "A.C. Sources," to permit, for one time only, continued at-power dual-unit operation of up to 240 hours with the swing diesel generator (No. 12) out of service. This extension of the allowed period of diesel generator inoperability has been made contingent in the Action Statements of T.S. 3/4.8.1 upon the continued operability of each unit's dedicated diesel generator and of all three offsite A.C. power supplies. The amendments shall be used only to determine and correct the cause of the carbon monoxide leakage into the No. 12 diesel generator jacket water coolant system. This extension shall expire upon completion of repairs to the No. 12 diesel generator.

A copy of the related Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next bi-weekly Federal Register notice.

Sincerely,

15/

Scott Alexander Mc Neil, Project Manager  
PWR Project Directorate #8  
Division of PWR Licensing-B

Enclosures:

1. Amendment No. 121 to DPR-53
2. Amendment No. 103 to DPR-69
3. Safety Evaluation

cc w/enclosure:  
See next page

\*See previous white for concurrences

8609120337 860908  
PDR ADCCK 05000317  
P PDR

PBD#8  
PMKreutzer\*  
09/04/86

PBD#8  
SMcNeil\*  
09/04/86

*WR*  
WRRegan  
9/8/86

PBD#8  
ATHadani\*  
09/04/86

OGC-Bethesda  
JScinto (by telephone)  
09/08/86

Docket Nos. 50-317  
and 50-318

Mr. J. A. Tiernan  
Vice President - Nuclear Energy  
Baltimore Gas & Electric Company  
P. O. Box 1475  
Baltimore, Maryland 21203

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Dear Mr. Tiernan:

The Commission has issued the enclosed Amendment Nos. and to Facility Operating License Nos. DPR-53 and DPR-69 for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications in response to your application dated August 1, 1986 as supplemented by your letter dated August 25, 1986. During this review process, minor changes were made to LCO 3.8.1.1.a.2 and to the numbering of the surveillance requirements of surveillance 4.8.1.1.2 for the purpose of clarification. These changes were made with the consent of your staff.

The amendments temporarily change Technical Specification (TS) 3/4.8.1, "A.C. Sources," to permit, for one time only, continued at-power dual-unit operation of up to 240 hours with the swing diesel generator (No. 12) out of service. This extension of the allowed period of diesel generator inoperability has been made contingent in the Action Statements of T.S. 3/4.8.1 upon the continued operability of each unit's dedicated diesel generator and of all three offsite A.C. power supplies. The amendments shall be used only to determine and correct the cause of the carbon monoxide leakage into the No. 12 diesel generator jacket water coolant system. This extension shall expire upon completion of repairs to the No. 12 diesel generator.

A copy of the related Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next bi-weekly Federal Register notice.

Sincerely,

Scott Alexander Mc Neil, Project Manager  
PWR Project Directorate #8  
Division of PWR Licensing-B

Enclosures:

1. Amendment No. to DPR-53
2. Amendment No. to DPR-69
3. Safety Evaluation

cc w/enclosure:  
See next page

PBD#8  
PMKreutzer  
9/4/86

PBD#8  
SMcNeil  
9/4/86

FOB  
WRegan  
1/86

AT  
PBD#8  
ATHadani  
9/14/86

OGC-Bethesda  
1/86

Mr. J. A. Tiernan  
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant

cc:

Mr. William T. Bowen, President  
Calvert County Board of  
Commissioners  
Prince Frederick, Maryland 20768

Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
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Project Manager  
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Windsor, Connecticut 06095-0500

Department of Natural Resources  
Energy Administration, Power Plant  
Siting Program  
ATTN: Mr. T. Magette  
Tawes State Office Building  
Annapolis, Maryland 21204



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

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 121  
License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Baltimore Gas & Electric Company (the licensee) dated August 1, 1986 as supplemented by the August 25, 1986 submittal, 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.

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PDR ADOCK 05000317  
P PDR

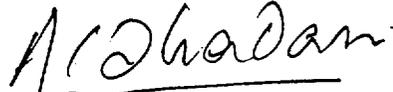
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-53 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 121, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This amendment is temporary and shall be used only once. This amendment is effective upon issuance and shall be implemented when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this amendment is cancelled and the previous TS are reinstated.

FOR THE NUCLEAR REGULATORY COMMISSION



Ashok C. Thadani, Director  
PWR Project Directorate #8  
Division of PWR Licensing-B

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: September 8, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 121

FACILITY OPERATING LICENSE NO. DPR-53

DOCKET NO. 50-317

Insert the following pages into the Appendix "A" Technical Specifications. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are provided to maintain document completeness.

Insert Pages

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

DO NOT remove the identical pages issued by the previous amendment. They are to be reinstated upon expiration of the temporary changes issued herewith.

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### 3/4.8.1 A.C. SOURCES

##### OPERATING

##### LIMITING CONDITIONS FOR OPERATION

---

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

- a. Three physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system consisting of the following:
  1. Two 500 Kv offsite power circuits, and
  2. The 69 Kv SMECO offsite power circuit described in the January 14, 1977 Safety Evaluation.
- b. Two separate and independent diesel generators (one of which may be a swing diesel generator capable of serving either Unit 1 or Unit 2) each with:
  1. Separate day fuel tanks containing a minimum volume of 375 gallons of fuel,
  2. A common fuel storage system consisting of two independent storage tanks each containing a minimum volume of 18,250 gallons of fuel, and
  3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

##### ACTION:

- a. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter; and 4.8.1.1.2 within 24 hours and at least once per 72 hours thereafter, unless the diesel generators are already operating. Restore all three offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

---

NOTE: Technical Specification 3/4.8.1 (Amendment No. 121) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### 3/4.8.1 A.C. SOURCES

##### OPERATING

##### LIMITING CONDITION FOR OPERATION

---

##### ACTION: (continued)

- b. With No. 12 diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter, and Surveillance Requirement 4.8.1.1.2 within 24 hours and at least once per 72 hours thereafter. Restore two diesel generators to OPERABLE status within 240 hours or by 4:00 p.m. E.D.T. on September 23, 1986, whichever comes first, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With two offsite circuits and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter and Surveillance Requirement 4.8.1.1.2 within 8 hours, unless the diesel generators are already operating. Restore at least 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 all three offsite circuits and No. 11 diesel generator to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- d. With three of the above required offsite A.C. circuits and one diesel generator inoperable, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of three offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter; restore No. 11 diesel generator 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. Restore

NOTE: Technical Specification 3/4.8.1 (Amendment No.121) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### 3/4.8.1 A.C. SOURCES

##### OPERATING

##### LIMITING CONDITION FOR OPERATION

---

##### ACTION: (Continued)

e. (Continued)

at least two diesel generators to OPERABLE status within 240 hours from time of initial loss or by 4:00 p.m. E.D.T on September 23, 1986, whichever comes first, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

f. The provisions of Specification 3.0.4 are not applicable.

##### SURVEILLANCE REQUIREMENTS

---

4.8.1.1.1 Each required independent circuit between the offsite transmission network and the onsite Class 1E distribution system shall be demonstrated OPERABLE, as follows:

- a. For each 500 Kv offsite circuit, at least once per 8 hours by verifying correct breaker alignments and indicated power availability,
- b. For the 69 Kv SMECO offsite power circuit, at least once per 8 hours by verifying correct breaker alignments and indicated power availability.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE at least once per 72 hours on a STAGGERED TEST BASIS by\*:

- a. Verifying the fuel level in the day fuel tank.
- b. Verifying the fuel level in the fuel storage tank.
- c. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the day tank.

\*All engine starts for the purpose of this Surveillance Requirement may be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that mechanical wear and stress on the diesel engine is minimized.

NOTE: Technical Specification 3/4.8.1 (Amendment No. 103) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.

ELECTRICAL POWER SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 (Continued)

- d. Verifying the diesel starts and accelerates to at least 900 rpm with generator voltage and frequency at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz, respectively.
- e. Verifying the generator is synchronized, loaded to  $\geq 1250$  Kw, and operates for  $\geq 60$  minutes.
- f. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

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NOTE: Technical Specification 3/4.8.1 (Amendment No.103) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.



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

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 103  
License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Baltimore Gas & Electric Company (the licensee) dated August 1, 1986 as supplemented by the August 25, 1986 submittal, 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-69 is hereby amended to read as follows:

2. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 103, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This amendment is temporary and shall be used only once. This amendment is effective upon issuance and shall be implemented when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this amendment is cancelled and the previous TS are reinstated.

FOR THE NUCLEAR REGULATORY COMMISSION



Ashok C. Thadani, Director  
PWR Project Directorate #8  
Division of PWR Licensing-B

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: September 8, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 103

FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NO. 50-318

Insert the following pages into the Appendix "A" Technical Specifications. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are provided to maintain document completeness.

Insert Pages

3/4 8-1

3/4 8-2

3/4 8-3

3/4 8-4

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## 3/4.8 ELECTRICAL POWER SYSTEMS

### 3/4.8.1 A.C. SOURCES

#### OPERATING

#### LIMITING CONDITIONS FOR OPERATION

---

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

- a. Three physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system consisting of the following:
  1. Two 500 Kv offsite power circuits, and
  2. The 69 Kv SMECO offsite power circuit described in the January 14, 1977 Safety Evaluation.
- b. Two separate and independent diesel generators (one of which may be a swing diesel generator capable of serving either Unit 1 or Unit 2) each with:
  1. Separate day fuel tanks containing a minimum volume of 375 gallons of fuel,
  2. A common fuel storage system consisting of two independent storage tanks each containing a minimum volume of 18,250 gallons of fuel, and
  3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

- a. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter; and 4.8.1.1.2 within 24 hours and at least once per 72 hours thereafter, unless the diesel generators are already operating. Restore all three offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

---

NOTE: Technical Specification 3/4.8.1 (Amendment No. 103) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

ACTION: (continued)

- b. With No. 12 diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter, and Surveillance Requirement 4.8.1.1.2 within 24 hours and at least once per 72 hours thereafter. Restore two diesel generators to OPERABLE status within 240 hours or by 4:00 p.m. E.D.T. on September 23, 1986, whichever comes first, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With two offsite circuits and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter and Surveillance Requirement 4.8.1.1.2 within 8 hours, unless the diesel generators are already operating. Restore at least 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 all three offsite circuits and No. 21 diesel generator to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- d. With three of the above required offsite A.C. circuits and one diesel generator inoperable, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of three offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter; restore No. 21 diesel generator 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. Restore

NOTE: Technical Specification 3/4.8.1 (Amendment No.103) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### 3/4.8.1 A.C. SOURCES

##### OPERATING

##### LIMITING CONDITION FOR OPERATION

---

##### ACTION: (Continued)

- e. (Continued)  
at least two diesel generators to OPERABLE status within 240 hours from time of initial loss or by 4:00 p.m. E.D.T on September 23, 1986, whichever comes first, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- f. The provisions of Specification 3.0.4 are not applicable.

##### SURVEILLANCE REQUIREMENTS

---

4.8.1.1.1 Each required independent circuit between the offsite transmission network and the onsite Class 1E distribution system shall be demonstrated OPERABLE, as follows:

- a. For each 115 Kv offsite circuit, at least once per 8 hours by verifying correct breaker alignments and indicated power availability,
- b. For the 69 Kv SMECO offsite power circuit, at least once per 8 hours by verifying correct breaker alignments and indicated power availability.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE at least once per 72 hours on a STAGGERED TEST BASIS by\*:

- a. Verifying the fuel level in the day fuel tank.
- b. Verifying the fuel level in the fuel storage tank.
- c. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the day tank.

\*All engine starts for the purpose of this Surveillance Requirement may be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that mechanical wear and stress on the diesel engine is minimized.

NOTE: Technical Specification 3/4.8.1 (Amendment No. 103) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.

ELECTRICAL POWER SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

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4.8.1.1.2 (Continued)

- d. Verifying the diesel starts and accelerates to at least 900 rpm with generator voltage and frequency at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz, respectively.
- e. Verifying the generator is synchronized, loaded to  $\geq 1250$  Kw, and operates for  $\geq 60$  minutes.
- f. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

---

NOTE: Technical Specification 3/4.8.1 (Amendment No.103) is temporary and shall be used only once. This TS shall become effective when No. 12 diesel generator is taken out of service to determine and repair the causes of the leakage of carbon monoxide or other combustion products into the jacket water cooling system of No. 12 diesel generator. Upon completion of these repairs, this TS is cancelled and the previous TS shall be reinstated.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 121 AND 103

TO FACILITY OPERATING LICENSE NOS. DPR-53 AND DPR-69

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

INTRODUCTION

Baltimore Gas & Electric (BG&E, the licensee) has requested a one time only extension of the provisions of Section 3/4.8.1, "AC Sources", of the Calvert Cliffs 1 & 2 Technical Specifications (TS). The requested extension would allow the licensee to take Emergency Diesel Generator (EDG) 12 out of service for 240 hours (10 days) while in Limiting Condition For Operation (LCO) Action Statement "b" of the above TS prior to being required to shutdown to Hot Standby conditions. During the review process, minor changes were made to LCO 3.8.1.1.a.2 and to the numbering of the surveillance requirements of surveillance 4.8.1.1.2 for the purpose of clarification. The phrase "and one 500 Kv offsite power circuit, and" was deleted from LCO 3.8.1.1.a.2 as it was now redundant with the requirements of LCO 3.8.1.1.a.2 in that both LCOs are required to be met when previously, only one of the two was required to be followed. The numbering of the surveillances was changed to reflect the standard numbering sequence used for Technical Specifications. The licensee has requested the TS action in order to allow time to disassemble and inspect EDG 12 for possible breaches in the combustion chamber/jacket water boundary. The following is a discussion and the staff's evaluation of the licensee's request.

BACKGROUND

The licensee has observed a gas buildup in the jacket water heat exchanger of EDG 12. This gas has been identified as carbon monoxide (CO). The most probable source of the CO is a leak between the diesel engine combustion chambers and the jacket water system. The EDG vendor (Fairbanks Morse) has identified several possible causes of the suspected leak(s), including seal failures and/or cylinder liner cracks. The vendor is not able to be more specific as to cause, nor can they predict the consequences of any leak(s) without thorough inspection and testing of the diesel engine. The licensee proposes to take EDG 12 out of service for up to 10 days in order to conduct thorough testing and inspection to determine the cause of the suspected leak(s) and effect repairs, as required.

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PDR ADOCK 05000317  
P PDR

### STAFF CONCERNS

The onsite AC power system at Calvert Cliffs consists of 3 identical EDG's. EDG 11 is dedicated to Unit 1, while EDG 21 is dedicated to Unit 2. EDG 12 is a "swing diesel"; i.e., it can be aligned to substitute for EDG's 11 or 21. With EDG 12 out of service, there is no backup for the other EDG's. The principle issues involved in this amendment relate to the potential for a loss of offsite power (LOOP) coincident with the failure of EDG 11 or 12 during the 10 days EDG 12 would be out of service. This scenario would result in a station blackout for the unit associated with the failed EDG. The immediate concerns would be (1) decay heat removal, and (2) loss of primary inventory as a consequence of reactor coolant pump seal leakage.

The licensee has addressed the above concerns and provided data on plant design features and/or special considerations which the licensee feels will mitigate the consequences of the above event. These design features and special considerations are discussed in further detail in subsequent sections of this report.

### MITIGATING FEATURES

#### Offsite Power

There are two, independent, 500 kV transmission lines coming into the Calvert Cliffs site. These transmission lines connect to the BG&E grid and supply power to the plant during normal operation as well as during shutdown and startup. In normal operation, Unit 1 is powered from one 500 kV source, and Unit 2 is powered from the other 500 kV source. However, the system is designed with the capability for each 500 kV source to power both units simultaneously. This diversity ensures that the loss of a single 500 kV source will not result in a station blackout, assuming the failure of an EDG. The operators at Calvert Cliffs are trained in the procedures to align the 500 kV sources, as required, to feed both units from either source.

In the event both 500 kV power sources are lost, there is a third offsite power source available. This third source is a 69 kV feeder from the Southern Maryland Electric Cooperative (SMECO). The SMECO feeder is not connected directly to the BG&E grid. SMECO obtains power from Potomac Electric Power Company (PEPCO) which, in turn, is connected to a larger, East Coast grid which includes BG&E. With the above arrangement, the SMECO feeder is essentially isolated from the BG&E distribution system. This ensures that disturbances on the BG&E system will have little, if any, impact on the 69 kV SMECO feeder. During the out of service period for EDG 12, the 69 kV feeder will be used to energize 13 kV bus 23. Bus 23, in turn, can be aligned to power all plant safety buses through manual action in the control room. The SMECO feeder is sized to carry safe shutdown loads in both units simultaneously. During the out of service time for EDG 12, the SMECO feeder will only be used to power 13 kV bus 23.

For added reliability, the licensee has committed to limit maintenance on the 500 kV transmission lines to only necessary activities during the time EDG 12 is out of service. This will minimize challenges to offsite power availability.

Calvert Cliffs has never had a complete loss of offsite power, which indicates good stability of the BG&E grid. The 500 kV transmission lines and towers are designed to withstand winds of 100 and 160 mph, respectively. Winds of this velocity could be from a hurricane or a tornado. While the incidence of hurricanes of 100 mph magnitude in the Calvert Cliffs area is very low (only one in recorded history), the licensee has committed to reduce power to 300 MW in the event a hurricane with 70 mph winds is anticipated, and to shut down in the event a hurricane with 90 mph winds is anticipated. Tornadoes can be spawned at any time, given the right meteorological conditions. Tornadoes with wind velocities in excess of 100 mph in the Calvert Cliffs area are also very rare. Regardless of the incidence of tornadoes, the offsite power network could withstand a tornado with winds in excess of 100 mph. This is because the BG&E transmission line and the SMECO feeder occupy different rights of way and it is extremely unlikely that a single tornado would strike both. At the site, the 500 kV lines are overhead while the SMECO feeder is underground. A tornado right at the site may damage the 500 kV lines, but would not affect the SMECO feeder.

To compensate for the loss of EDG 12 during the requested 10 day outage of the diesel, the staff will impose an LCO requiring all the offsite power sources be available during the time EDG 12 is out of service. The specifics of this LCO are contained in the one-time Technical Specifications which are included as Appendix A of this evaluation.

### 125 VDC Power

The DC electrical power system (including batteries, battery chargers, and inverters) consist of four separate, independent and isolated channels, each of which feeds both units. In the event of a complete loss of AC power to one unit, the DC system battery chargers would be powered from the other unit's AC power (either offsite or EDG). With this arrangement, 125 VDC power for operation of the auxiliary feed pumps and atmospheric dump valves would be available for an indefinite period of time.

### Auxiliary Feed Pumps

There are two steam driven auxiliary feed pumps in each unit at Calvert Cliffs. The steam admission valves to these feed pumps are maintained closed by air pressure during normal operation. To open the steam valves, a 125 VDC solenoid valve is opened by remote control and the air in the pressure chamber is released to the atmosphere. As described above, 125 VDC power will be available for solenoid valve operation. In addition to the solenoid valve, the air in the pressure chamber can be released through a manually operated valve. Each pump is capable of providing the feedwater required for decay heat removal. The redundancy of the auxiliary feed pumps with the capability of manual operation assures the availability of auxiliary feedwater, if required.

If both steam driven auxiliary feed pumps were not available, there is a cross connect between units which allows a motor driven auxiliary feed pump in the non-affected unit to supply feed water to the unit without AC power or steam driven pumps.

In the event of a shutdown using onsite (EDG) AC power, auxiliary feed pump control (for steam generator level control) is accomplished automatically using compressed air from the instrument air system. The licensee has stated that there is adequate compressed air storage for auxiliary feed pump control for about 2 hours following the complete loss of AC power. When the compressed air is depleted, the pump/steam generator level can be controlled manually by throttling the auxiliary feed pump steam inlet valve or feedwater discharge valve, or both.

#### Atmospheric Dump Valves

The atmospheric dump valves are powered from the 125 VDC bus and can be operated remotely from the control room. As stated above, the 125 VDC systems can be assured from either unit and would be available for an indefinite period of time. Therefore, the atmospheric dump valves would be available for decay heat removal for an indefinite period of time. Should the remote control become inoperative for any reason, the atmospheric dump valves can be operated manually from the auxiliary building at the 45 foot elevation. Personnel operating the valves manually would be protected from the heat and noise attendant to opening steam dump valves.

#### Emergency Diesel Generators

The staff has reviewed operational data and inspection reports relating to all EDG's at Calvert Cliffs. The staff did not find any history of frequent failures or indications of adverse trends for any of the EDG's. Following this review of data, the staff concluded that the EDG's are well maintained and that the personnel responsible for the EDG's are knowledgeable and are thorough in their approach to EDG maintenance. The staff could not find any obvious reason why the EDG's could not be relied upon to start when required.

The staff also witnessed a firing pressure test on EDG 12 during a site visit to review operational data. The firing pressures were in the proper range for the operating load and were uniform (within acceptable tolerances). The crankcase vacuum was high which indicates good piston ring sealing and confirms the adequacy of the firing pressures. The results of the above test support the staff's observations made during the review of operational data.

#### Transportable Diesel Generator

The licensee has located a 1000 kW transportable diesel generator which could be delivered to the Calvert Cliffs site within a matter of hours, if required. This transportable diesel generator would operate at 480 VAC, 60 Hz., and would be connected to the plant 480V safety bus. Rated at 1000 kW, the diesel generator would be capable of powering all safety loads required to maintain primary inventory and adequate decay heat removal.

## STAFF EVALUATION AND CONCLUSIONS

The licensee's requested TS change involves entering a condition which was not considered by the staff in the original licensing review for Calvert Cliffs; i.e., one EDG out of service for more than 72 hours without a plant shutdown. To fully evaluate the potential consequences of the proposed action, the staff postulated an event which, itself, is beyond the design basis for the plant; however, it is appropriate in this case because of the extended inoperability status of the "swing diesel." This event is a complete loss of AC power to one unit for an indeterminate period of time. The staff then reviewed and evaluated the plant design features, additional equipment, and/or plant personnel actions the licensee would utilize to mitigate the consequences of the postulated event. The preceding sections of this evaluation contain descriptions of the plant design features and/or personnel actions the licensee would utilize. With the exception of reactor coolant pump seal leakage, the staff has concluded that existing plant designs and licensee actions, combined, are adequate to mitigate the consequences of the postulated event for a long period of time.

Results of tests on reactor coolant pump seals by the pump vendor (Byron Jackson), and actual pump operating history, support the vendor position that these seals would not be damaged as a consequence of a loss of seal cooling water due to a complete loss of AC power. However, in the unlikely event of seal damage, the licensee has stated that the reactor coolant pump seals would not fail from a 2 hour complete loss of AC power. Additionally, previous experimental test data has indicated that in the event of the failure of all four seals on a reactor coolant pump, the expected seal leakage would not exceed 40 GPM. At this rate, it would take approximately 1 day to deplete the primary inventory to an unsafe level. The underground 69kV feeder at Calvert Cliffs is not as susceptible to failure during adverse meteorological conditions as are the 500kV transmission lines. This provides added assurance that offsite power can be restored quickly. Commission studies state that restoration of offsite power to nuclear plants generally occurs within 4 hours for the loss of offsite power events. Based on this, power would be restored to the charging pumps long before the primary inventory could be depleted below an unacceptable level. If offsite power could not be restored, there is still adequate time to deliver a transportable diesel generator to the site and connect it to the safety bus to power the charging pumps. The above scenario is unlikely because it would require, simultaneously, (1) complete loss of three offsite power sources to the extent they could not be restored in a day's time; (2) loss of an EDG; and (3) failure of four reactor coolant pump seals, resulting in a net leakage rate of 40 GPM.

Based on its evaluation, the staff concludes that a one-time TS change to allow EDG 12 to be out of service for 10 days while the plant (Units 1 & 2) remains at full power is acceptable.

FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION.

The Commission's regulation 10 CFR 50.92 states that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the amendment would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) involve a significant reduction in a margin of safety.

The only accident considerations affected by the amendment are those relating to the potential for station blackout. The station blackout (the loss of all A.C. power) is protected against by the provisions of 10 CFR 50, Appendix A, Criterion 17 (GDC 17), "Electric power systems" and by the limited period of inoperability permitted for power supplies by the Technical Specifications. GDC 17 ensures that the licensee has sufficient redundancy of electrical systems, both offsite and onsite, to ensure that the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. Currently, the licensee is permitted to operate both reactors for periods of up to 72 hours with one diesel generator inoperable. In the event of a single failure of one of the two remaining diesel generators following a loss of the 2 offsite A.C. power circuits, one of the two units would be in the station blackout scenario. The Commission considers this scenario to be highly improbable and as such, no further compensatory measures are required of the licensee.

Operation of the facility in accordance with the proposed amendment would allow the licensee to operate for a period of up to 10 days with one diesel generator inoperable. To assure that the proposed amendment would not result in a significant increase in the probability of the station blackout scenario as a result of the 7 additional days of permissible diesel generator inoperability, additional requirements are provided to have 3 operable offsite A.C. power circuits operable rather than the 2 offsite A.C. power circuits normally required. The probability of the station blackout scenario is further reduced by the source and design of the third operable offsite A.C. circuit. This circuit is provided power from a grid different from that which supplies the 2 circuits normally utilized. Additionally, the right-of-way of this circuit comes underground from the west while the other 2 circuits come from the north. Due to these factors, the Commission has determined that operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of the station blackout or of any other accident previously evaluated.

The accident of concern for this proposed amendment as discussed above is the station blackout which was previously considered. The proposed amendment would not create the possibility of a new or different kind of accident from any previously evaluated.

Finally, this proposed amendment does not involve a significant reduction in any margin of safety.

Based upon the considerations provided above, the staff concludes that the proposed amendment meets thr three criteria of 10 CFR 50.92 and, as such, involves no significant hazards considerations.

#### STATE CONSULTATIONS

The State of Maryland was consulted on this matter and had no comments on the determination.

#### ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The 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 published a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these 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 these amendments.

#### CONCLUSION

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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