

Mr. Charles H. Cruse
 Vice President - Nuclear Energy
 Baltimore Gas and Electric Company
 Calvert Cliffs Nuclear Power Plant
 1650 Calvert Cliffs Parkway
 Lusby, MD 20657-4702

April 14, 1999

SUBJECT: ISSUANCE OF AMENDMENTS FOR CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1 (TAC NO. MA4224) AND UNIT NO. 2 (TAC NO. MA4225)

Dear Mr. Cruse:

The Commission has issued the enclosed Amendment No. 230 to Facility Operating License No. DPR-53 and Amendment No. 206 to Facility Operating License No. DPR-69 for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated November 19, 1998.

The amendments revised Technical Specification (TS) 3.7.6 "Service Water (SRW) System" to allow operation of Calvert Cliffs Unit Nos. 1 and 2 with one SRW plate and frame heat exchanger in a subsystem secured and removing one containment air cooler from service to enable the affected SRW subsystem to remain operable.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY:

Alexander W. Dromerick, Senior Project Manager, Section 1
 Project Directorate I
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

Docket Nos. 50-317
 and 50-318

- Enclosures: 1. Amendment No. 230 to DPR-53
 2. Amendment No. 206 to DPR-69
 3. Safety Evaluation

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*See previous concurrence

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

April 14, 1999

Mr. Charles H. Cruse
Vice President - Nuclear Energy
Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: ISSUANCE OF AMENDMENTS FOR CALVERT CLIFFS NUCLEAR POWER
PLANT UNIT NO. 1 (TAC NO. MA4224) AND UNIT NO. 2 (TAC NO. MA4225)

Dear Mr. Cruse:

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The amendments revised Technical Specification (TS) 3.7.6 "Service Water (SRW) System" to allow operation of Calvert Cliffs Unit Nos. 1 and 2 with one SRW plate and frame heat exchanger in a subsystem secured and removing one containment air cooler from service to enable the affected SRW subsystem to remain operable.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

A handwritten signature in cursive script, reading "Alexander W. Dromerick".

Alexander W. Dromerick, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-317
and 50-318

Enclosures: 1. Amendment No. 230 to DPR-53
2. Amendment No. 206 to DPR-69
3. Safety Evaluation

cc w/encls: See next page

Baltimore Gas & Electric Company

cc:

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Unit Nos. 1 and 2

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Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

DATED: April 14, 1999

AMENDMENT NO. 230 TO FACILITY OPERATING LICENSE NO. DPR-53-CALVERT
CLIFFS UNIT 1

AMENDMENT NO. 206 TO FACILITY OPERATING LICENSE NO. DPR-69-CALVERT
CLIFFS UNIT 2

~~Docket File~~

PUBLIC

PDI-1 Reading

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

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 230
License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated November 19, 1998, 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-53 is hereby amended to read as follows:

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2. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 230 , 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



S. Singh Bajwa, 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: April 14, 1999



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

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 206
License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated November 19, 1998, 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 Appendices A and B, as revised through Amendment No. 206 , 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



S. Singh Bajwa, 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: April 14, 1999

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 230 FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 206 FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NOS. 50-317 AND 50-318

Revise Appendix A as follows:

Remove Page

3.7.6-1

3.7.6-2

Insert Page

3.7.6-1

3.7.6-2

3.7.6-3

3.7 PLANT SYSTEMS

3.7.6 Service Water (SRW) System

LCO 3.7.6 Two SRW subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One SRW heat exchanger inoperable.</p>	<p>A.1 Isolate flow to one of the associated containment cooling units.</p> <p>-----NOTE ----- Enter applicable Conditions and Required Actions of LCO 3.6.6, "Containment Spray and Cooling Systems," for one containment cooling train made inoperable by the heat exchanger. -----</p>	<p>1 hour</p>
	<p><u>AND</u></p> <p>A.2 Restore heat exchanger to operable status.</p>	<p>7 days</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One SRW subsystem inoperable.	<p>B.1 -----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources--Operating," for diesel generator made inoperable by SRW. -----</p> <p>Restore SRW subsystem to OPERABLE status.</p>	72 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u> C.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.7.6.1 -----NOTE----- Isolation of SRW flow to individual components does not render SRW inoperable. -----</p> <p>Verify each SRW manual, power-operated, and automatic valve in the flow path servicing safety-related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	31 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.6.2	Verify each SRW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24 months
SR 3.7.6.3	Verify each SRW pump starts automatically on an actual or simulated actuation signal.	24 months



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 230 TO FACILITY OPERATING LICENSE NO. DPR-53
AND AMENDMENT NO. 206 TO FACILITY OPERATING LICENSE NO. DPR-69
BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

By letter dated November 19, 1998, Baltimore Gas and Electric (BGE) Company, the licensee for the Calvert Cliffs Nuclear Power Plant, Units 1 and 2, requested an amendment to Technical Specification (TS) 3.7.6, "Service Water (SRW) System," to allow operation of Calvert Cliffs with one SRW plate and frame heat exchanger (PHE) in a subsystem secured, and removing one containment air cooler (CAC) from service to enable the affected SRW subsystem to remain operable. The purpose of the amendment is to provide greater availability of safety-related equipment during PHE maintenance or other activities. Specifically, the proposed change would add a limiting condition for operation (LCO) to TS 3.7.6 that states, "One SRW heat exchanger inoperable." The actions required for the proposed LCO would be to secure one CAC within 1 hour and restore the heat exchanger to operable condition within 7 days, or be in Mode 3 in 6 hours and Mode 5 in 36 hours.

The proposed change is facilitated by BGE's project to replace each shell and tube SRW heat exchanger with a pair of new PHEs that have an increased thermal performance capability. The SRW heat exchangers on Calvert Cliffs Unit 1 were replaced during the 1998 refueling outage, and the replacement for Unit 2 is scheduled for the March 1999 refueling outage. The licensee's proposed change would not be applicable to Unit 2 until after the completion of the replacement activity.

2.0 BACKGROUND AND EVALUATION

The saltwater (SW) system is an open loop system, which utilizes the Chesapeake Bay as the supply source (ultimate heat sink). It consists of two subsystems that provide SW to cool the SRW heat exchangers, component cooling (CC) system heat exchangers, and the emergency core cooling system pump room air coolers. During normal operation, both subsystems are in service with one pump on each subsystem, and a third pump in standby that can supply either subsystem. SW flow through the SRW and CC heat exchangers is throttled to provide sufficient cooling to the heat exchangers, and to maintain total subsystem flow to prevent pump runout. Following a loss-of-coolant accident (LOCA), the SW system has two phases, which include pre- and post-Recirculation Actuation Signal (RAS). Each subsystem can satisfy

the design heat removal requirements during both phases of the accident. During pre-RAS, a Safety Injection Actuation Signal (SIAS) automatically reconfigures each SW subsystem to fully open the SRW heat exchanger SW outlet valves. An SIAS will permit the emergency core cooling system (ECCS) pump room air coolers to be cooled by SW if the room temperatures exceed the designated limits, and it will automatically isolate the SW flow to the CC heat exchangers. On an RAS, the SW isolation valves on the CC heat exchanger return to their pre-accident positions and the operator can throttle flow to maintain CC temperatures. The SRW heat exchangers and the ECCS pump room air coolers continue to operate during this phase. During post-RAS, an operator has to remotely throttle the SW outlet valves for the CC and SRW heat exchangers to maintain system design temperatures.

The SRW System is a closed loop system, which utilizes plant demineralized water that is treated with a corrosion inhibitor. It consists of two subsystems that remove heat from various turbine plant components, a blowdown recovery heat exchanger, CACs, spent fuel pool cooling heat exchangers, and emergency diesel generator (EDG) heat exchangers. During normal operation, both subsystems are in service and fully redundant to assure the safe operation and shutdown of the plant, assuming a single failure. The SRW supply temperature is maintained at ≤ 95 degrees F for normal operation. During shutdown, operation of the SRW system is essentially the same as during normal operation, except that the heat loads are reduced. During a LOCA, each SRW subsystem supplies two CACs to support the cooldown of containment and one EDG (except No. 1A EDG, which is air-cooled) to ensure continued reliable operation of the EDGs as an emergency power supply. The SRW system design temperature initially increases to 115 degrees F, and subsequently decreases below 105 degrees F within 35 minutes. The SRW supply temperature is maintained at or below 105 degrees F for the remainder of the event.

The CACs are provided with SRW to remove heat from the containment during normal plant operation and in the event of a LOCA or main steam line break. There are two containment cooling trains, which consist of a total of four CACs (two CACs per train). During a design basis accident, a minimum of one containment cooling train and one containment spray train is required to maintain the containment peak pressure and temperature below the design limits.

The SRW heat exchanger modification includes replacement of the two existing shell and tube SRW heat exchangers with four new PHEs that have an increased thermal performance capability. Two PHEs would operate in parallel on each of the two SRW subsystems. Each subsystem is redundant and capable of removing the accident heat load from two CACs and an EDG at SW supply temperature of ≤ 90 degrees F while maintaining SRW within its design limit. The modification includes a flow control scheme to throttle saltwater flow to the SRW heat exchangers and the associated bypass lines. It also includes SW strainers that are installed upstream of each PHE (two strainers per subsystem) to remove debris and minimize macrofouling in the heat exchangers. A manual SW isolation valve is provided upstream of each strainer to allow for isolation of any selected strainer and PHE combination.

The current licensing basis requires that when one PHE is taken out-of-service or isolated, the affected SRW subsystem is considered inoperable. The remaining operable SRW subsystem is sufficient to remove the heat load during normal operations or a design basis accident with SW temperatures ≤ 90 degrees F. With the PHE heat exchanger modification, valves are

provided in the SW and SRW systems to allow isolation of any selected strainer and PHE combination while continuing to operate the other PHE, the CC heat exchanger, and the ECCS pump room air coolers on the affected SW subsystem. The licensee determined that a single PHE cannot remove the full LOCA heat load while maintaining SRW temperature within its design limits. However, if one CAC on the affected subsystem is isolated and removed from operation, the single PHE can remove the remaining accident heat load on that subsystem.

Therefore, the licensee has proposed to revise the TSs to allow one PHE and an associated CAC to be isolated on the affected SRW subsystem to reduce the SRW subsystem heat load sufficiently to ensure that the remaining PHE can maintain SRW subsystem temperatures within their design limits. This would allow for continued operation of the affected EDG, the remaining CAC on the affected subsystem, and the associated CC and ECCS cooling train to remain operable while the one PHE is isolated. The other SW and SRW subsystems would still have two operable PHEs and would satisfy the assumptions in the accident analysis.

The licensee stated that the proposed isolation of one CAC to enable the remaining subsystems to remain operational has no operational impact on the affected containment cooling train subsystem since under the current licensing basis and the proposed TS change, the TS LCO for an inoperable containment cooling train is entered. A minimum of one containment cooling train (two of the four CACs) and one containment spray train is required during a design basis accident (DBA) to maintain the containment peak pressure and temperature below the design limits. Under the current TS requirement, with one containment cooling train inoperable, the inoperable containment cooling train must be returned to operable status within 7 days. The 7-day completion time was developed taking into account the redundant heat removal capabilities available by combinations of the containment spray and cooling systems, and the low probability of a DBA occurring during this period. The proposed change to TS 3.7.6 would allow three CACs to remain operable during the maintenance on a PHE, instead of two CACs under the current TS requirement. Also, the proposed 7-day completion time to restore the inoperable PHE to operable status is consistent with the completion time for an inoperable containment cooling train.

In the current licensing basis, the licensee found that the overall reliability of the SRW system is reduced when one PHE is isolated since the associated SRW subsystem is considered inoperable and a single failure in the SRW system could result in the loss of the SRW function. This, in turn, could result in the loss of the one operable EDG and all EDG-backed electrical loads. While many malfunctions could result in the complete loss of a safety function while one SRW train is inoperable, they would not necessarily result in the loss of the associated function under the proposed revision to the TSs. The proposed change would maintain the design redundancy feature of all safety-related equipment, except the affected CAC train, during SRW heat exchanger maintenance or other activities. By providing the second EDG, the CC and ECCS cooling equipment on the affected subsystem, the licensee stated that the consequences of many malfunctions during the period required for PHE maintenance would be reduced since redundancy would still be available.

Based on its review, the staff found that while one PHE is isolated for maintenance or other activities and one CAC on the affected subsystem is removed from service, the minimum system requirements in accordance with Standard Review Plan 9.2.1, "Station Service Water System," would still be met since the other SW and SRW subsystems would still have two

operable PHEs and would satisfy the assumptions in the accident analysis. Also, the proposed TS change would provide greater availability of safety-related components since the EDG and one CAC on the affected subsystem and the associated CC and ECCS cooling train would be operable.

The staff agrees with the licensee that the proposed TS change would provide greater availability of safety-related equipment during PHE maintenance or other activities. Based on the above, the staff concludes that the licensee's proposed revision to TS 3.7.6 to allow operation of Calvert Cliffs Nuclear Power Plant, Units 1 and 2, with one SRW PHE in a subsystem secured, and removing one CAC from service to enable the affected SRW subsystem to remain operable, is acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Maryland 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. 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 (63 FR 69333). 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: V. Ordaz

Date: April 14, 1999