

September 26, 2005

Mr. George Vanderheyden, Vice President  
Calvert Cliffs Nuclear Power Plant, Inc.  
Calvert Cliffs Nuclear Power Plant  
1650 Calvert Cliffs Parkway  
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 -  
AMENDMENT RE: REACTOR TRIP CIRCUIT BREAKER SURVEILLANCE  
FREQUENCY EXTENSION (TAC NOS. MC4023 AND MC4024)

Dear Mr. Vanderheyden:

The Commission has issued the enclosed Amendment No. 275 to Renewed Facility Operating License No. DPR-53 and Amendment No. 252 to Renewed Facility Operating License No. DPR-69 for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated August 3, 2004, as supplemented on July 8 and August 26, 2005.

These amendments extend the surveillance frequency interval from monthly to quarterly for surveillance requirement (SR) 3.3.3.1 involving a channel functional test on each reactor trip circuit breaker (RTCB) channel in TS 3.3.3, "RPS [Reactor Protection System] Logic and Trip Initiation." SRs 3.3.3.1 and 3.3.3.2 will be scheduled such that the RTCBs testing is performed every 6 weeks, which meets the vendor-recommended interval for cycling each RTCB.

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,

**/RA/**

Patrick D. Milano, Sr. 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. 275 to DPR-53  
2. Amendment No. 252 to DPR-69  
3. Safety Evaluation

cc w/encls: See next page

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cc w/encls: See next page

DISTRIBUTION: See next page

Accession Number: ML052630123

OFFICE	PDI-1/PM	PDI-1/LA	SPSB/SC	EEIB/SC	OGC	PDI-1/SC
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DATE	09/19/05	09/20/05	09/19/05	09/19/05	09/22/05	09/23/05

OFFICIAL RECORD COPY

DATED: September 26, 2005

AMENDMENT NO. 275 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53  
CALVERT CLIFFS UNIT 1

AMENDMENT NO. 252 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69  
CALVERT CLIFFS UNIT 2

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CALVERT CLIFFS NUCLEAR POWER PLANT, INC.

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 275  
Renewed License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Calvert Cliffs Nuclear Power Plant, Inc. (the licensee) dated August 3, 2004, as supplemented on July 8 and August 26, 2005, 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 Renewed Facility Operating License No. DPR-53 is hereby amended to read as follows:

2. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 275, are hereby incorporated into 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

*/RA/*

Richard J. Laufer, 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: September 26, 2005

CALVERT CLIFFS NUCLEAR POWER PLANT, INC.

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 252  
Renewed License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Calvert Cliffs Nuclear Power Plant, Inc. (the licensee) dated August 3, 2004, as supplemented on July 8 and August 26, 2005, 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 Renewed 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. 252, 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

*/RA/*

Richard J. Laufer, 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: September 26, 2005

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 275 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 252 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NOS. 50-317 AND 50-318

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove Pages

3.3.3-2

Insert Pages

3.3.3-2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 275 TO RENEWED  
FACILITY OPERATING LICENSE NO. DPR-53  
AND AMENDMENT NO. 252 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69  
CALVERT CLIFFS NUCLEAR POWER PLANT, INC.  
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

By letter dated August 3, 2004 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML042190342), as supplemented on July 8 and August 26, 2005 (ADAMS Nos. ML051940201 and ML052420132, respectively), the Calvert Cliffs Nuclear Power Plant, Inc. (the licensee) submitted a request for changes to the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, Technical Specifications (TSs). The requested changes would extend the surveillance requirement frequency for the reactor trip circuit breakers (RTCBs) in TS 3.3.3, "RPS Logic and Trip Initiation." The proposed change is based on Combustion Engineering Owners Group (CEOG) Topical Report CE NPSD-951-A, Revision 1, "Reactor Trip Circuit Breakers Surveillance Frequency Extension," September 1999. The July 8 and August 26 letters provided information, clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination.

2.0 REGULATORY EVALUATION

2.1 Purpose of RTCB Subsystem

The reactor protection system (RPS) initiates a reactor trip to protect against violating the core-specified acceptable design limits and reactor coolant pressure boundary integrity during anticipated operational occurrences. By tripping the reactor, the RPS also assists the engineered safety features systems in mitigating accidents. On a trip signal from the RPS, the RTCBs open, creating a reactor trip by interrupting power to the control element drive mechanisms.

2.2 Purpose for the Surveillance Requirement

The function of the RTCBs is to open, creating a reactor trip by interruption of power to the control element drive mechanisms. There are two diverse devices in each RTCB to perform

this function, the shut trip device and the undervoltage trip device. The functional tests independently cycle each breaker undervoltage and shut trip devices. Therefore, each RTCB experiences a minimum of 66 trips during a refueling cycle, consisting of 48 trips from monthly RTCB channel functional tests (SR 3.3.3.1), 16 trips from quarterly RPS logic channel functional tests (SR 3.3.3.2), and 2 trips from post-refueling outage RPS manual tests (SR 3.3.3.3). The licensee considers this number of trips to be excessive and is causing undue wear of the mechanisms and is detrimental to the reliability of the breakers.

To verify proper operation, a channel functional test is performed on each RTCB every 31 days (monthly). Additionally, a channel functional test is performed on the RPS logic every 92 days (quarterly). The RPS logic channel functional test also tests each RTCB.

### 2.3 Background for the requirement

Section 50.36(c)(3) of Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR) requires the TSs include surveillance requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that the facility operation will be within safety limits, and that the limiting conditions for operation will be met.

General Design Criterion (GDC)-21, "Protection system reliability and testability," of Appendix A to 10 CFR Part 50 requires that protection systems be designed and tested for high functional reliability. GDC 25, "Protection system requirements for reactivity control malfunctions," requires design attributes for protection systems to assure that specified acceptable fuel design limits are not exceeded for reactivity control malfunctions. GDC 29, "Protections against anticipated operational occurrences," requires design attributes for protection systems to assure an extremely high probability of accomplishing their safety functions in the event of anticipated operational occurrences.

## 3.0 TECHNICAL EVALUATION

### 3.1 Requested TS Changes

The licensee requested a change in the SR 3.3.3.1 surveillance test interval (STI) from 31 days to 92 days. The proposed change would reduce the minimum number of RTCB trips from 66 to 34 per refueling cycle. The licensee's request is based on CE NPSD-951-A, which concluded that the RTCB STI could be extended from monthly to quarterly provided the RTCB and the RPS logic functional tests (RPS logic functional test includes RTCB functional test) are scheduled such that all RTCBs are tested once every 6 weeks. The NRC staff reviewed the topical report and found that it was acceptable, as documented in the safety evaluation report dated June 15, 1999, for those CE plants that participated in the CEOG program. The licensee for Calvert Cliffs was one of the participants in the CEOG program.

### 3.2 RISK ANALYSIS

The primary purpose of surveillance testing is to assure that the components in a standby system (safety system) will be operable when needed. The risk contribution associated with the STI is mainly due to the possibility that the component will fail between consecutive tests. By testing these components, failures can be detected that may have occurred since the last surveillance and the risk due to undetected failures can be limited. However, increasing the

time between surveillance tests may also have some benefits. Increased surveillance intervals may reduce test-induced transients, test-caused failures, equipment wear, and reduce required resources for testing. The disadvantage is the time a component will be subject to failure (the fault exposure time) will increase with an increased STI.

The licensee provided the results of a probabilistic risk assessment (PRA) based on increasing the STI for the RTCB test from monthly to quarterly with the RTCB and the RPS logic functional tests scheduled such that all RTCBs are tested once every 6 weeks. The results of the licensee's evaluation show that the change in core damage frequency ( $\Delta$ CDF) and change in large early release frequency ( $\Delta$ LERF) were within the acceptance guidelines of  $1E-6$  and  $1E-7$ , respectively, in Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," November 2002. The licensee based the analysis on a proportional increase of the demand failure rate (monthly to quarterly).

The NRC staff, as a check, performed confirmatory calculations using a simplified model for Calvert Cliffs. The staff review credited operator action along with the RTCB and the RPS logic functional tests scheduled such that all RTCBs are tested once every 6 weeks as assumed in CE NPSD-951-A. The staff results support the licensee's findings that the proposed RTCB STI  $\Delta$ CDF results in a small change in plant CDF. Alternate testing as implemented per the topical report results in all RTCBs being actuated once every 6 weeks which is a minimal increase from the current 31 days. According to the topical report, the RPS logic test is of greater scope and includes individual actuation of the breaker control relays along with the associated RTCBs. Based on these results and the licensee's analysis, the staff concludes that the proposed RTCB STI increase should result in only a small increase in risk for Calvert Cliffs.

As an additional check, the NRC staff reviewed NUREG/CR-5500, Vol. 10, "Reliability Study: Combustion Engineering Reactor Protection System, 1984 to 1998," which noted improved performance of RTCBs. The report indicated that the dominant RPS failure contributions to RPS involved common cause failure of the trip relays and the mechanical portion of the RTCBs. The report stated that credit for manual operator action reduced RPS unavailability significantly for RPS systems of similar design to Calvert Cliffs. The report also noted a decreasing trend in common cause events specific to RTCBs and an improving trend in undervoltage coil total failure probability.

The NRC staff finds that the licensee's increase in the RTCB STI does not reveal an unforeseen hazard or substantially greater potential for a known hazard to occur based on the minimal increase in RPS unavailability and the small increase in CDF (i.e., the increase in risk is within the RG 1.174 acceptance guidelines). The staff notes that the estimated risk impacts are small and should not significantly influence the overall results of the licensee's analysis. The staff did not identify "special circumstances" that, if reviewed on a risk-informed basis, would invalidate the assumption of adequate protection, warrant attaching additional conditions, or result in denial of the proposed license amendment. Although the staff used RG 1.174 and RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decision making: Technical Specifications," as guidance in its evaluation of the licensee's amendment request, the staff's review was limited to the licensee's CDF and LERF insights. The license amendment application did not follow the guidance of RG 1.174 or 1.177, but was based instead on CE NPSD-951-A.

Based on its review of the application and supporting information, the NRC staff finds the proposed TS to revise the RTCB STI for SR 3.3.3.1 from the current 31 days to 92 days is consistent with the justifications for the same TS change approved in CE NPSD-951-A, Revision 1, and is in conformance with 10 CFR 50.36(c)(3) and GDCs 21, 25, and 29. Therefore, the above TS changes are acceptable.

#### 4.0 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.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a surveillance requirement. 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 (70 FR 400). 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.

#### 6.0 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 Contributors: B. Marcus  
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Date: September 26, 2005