December 20, 2007

Mr. James A. Spina, 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: USE OF LEAD FUEL ASSEMBLIES AND CHANGE TO CORE OPERATING LIMITS REPORT ANALYTICAL METHODS (TAC NOS. MD4646, MD4647, MD4648, AND MD4649)

Dear Mr. Spina:

The Commission has issued the enclosed Amendment No. 283 to Renewed Facility Operating License No. DPR-53 and Amendment No. 260 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 two applications transmitted by letters, which were both dated February 27, 2007.

These amendments modify TS 4.2.1, "Fuel Assemblies," to permit up to four lead fuel assemblies (LFAs) with advanced cladding material to be inserted into the Unit 1 core for operating cycle 19 which is scheduled to begin in April 2008. These amendments also modify TS 5.6.5, "Core Operating Limits Report (COLR)," for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, to reference WCAP-15604-NP, "Limited Scope High Burnup Lead Test Assemblies," as an approved analytical method for extended LFA burnup limits.

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/

Douglas V. Pickett, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosures:
1. Amendment No. 283 to DPR-53
2. Amendment No. 260 to DPR-69
3. Safety Evaluation

cc w/encls: See next page

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Enclosures:
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cc w/encls: See next page
Package No.: ML073200414
Amendment No.: ML073200455
Tech Spec No.: ML073200470

OFFICE	LPLI-1/PM	LPLI-1/LA	SNPB/BC	ITSB/BC	OGC	LPLI-1/BC
NAME	DPickett	SLittle	AMendiola as signed on	TKobetz	MBaty	MKowal
DATE	12 /04/ 07	11 / 29 / 07	10 / 31 / 07	12 /7/ 07	12 / 03 /07	12 /18/ 07

OFFICIAL RECORD COPY

DATED: December 20, 2007

AMENDMENT NO. 283 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53
CALVERT CLIFFS UNIT 1

AMENDMENT NO. 260 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69
CALVERT CLIFFS UNIT 2

PUBLIC	
LPLI-1 R/F	
M. Kowal	RidsNrrDorlLpi-1
S. Little	RidsNrrLASLittle
D. Pickett	RidsNrrPMDPickett
G. Hill (2)	
OGC	RidsOgcMailCenter
ACRS	RidsAcrsAcnwMailCenter
A. Mendiola	RidsNrrDssSnpb
SWu	
G. Dentel, RI	

cc: Plant Service list

Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 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. 283
Renewed License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Calvert Cliffs Nuclear Power Plant, Inc. (the licensee), both dated February 27, 2007, comply 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. 283, 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Mark G. Kowal, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and Technical Specifications

Date of Issuance: December 20, 2007

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. 260
Renewed License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Calvert Cliffs Nuclear Power Plant, Inc. (the licensee), both dated February 27, 2007, comply 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. 260, 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

/RA/

Mark G. Kowal, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and Technical Specifications

Date of Issuance: December 20, 2007

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 283 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 260 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NOS. 50-317 AND 50-318

Replace the following pages of the Facility Operating License with the attached revised pages. The revised pages are identified by amendment number and contains marginal lines indicating the areas of change.

Remove Pages	Insert Pages
3 (DPR-53)	3
3 (DPR-69)	3

Replace the following pages of the 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.

Remove Pages	Insert Pages
4.0-1	4.0-1
4.0-2	4.0-2
4.0-3	4.0-3
5.6-8	5.6-8

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 283 TO RENEWED

FACILITY OPERATING LICENSE NO. DPR-53

AND AMENDMENT NO. 260 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 separate applications dated February 27, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML070610414 and ML070610357), Calvert Cliffs Nuclear Power Plant, Inc. (the licensee) requested changes to the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, Technical Specifications (TSs). The first application (i.e., ADAMS ML070610414) requested changes that would modify TS 4.2.1, "Fuel Assemblies," to permit the insertion of up to four lead fuel assemblies (LFAs) into the Unit 1 core for operating cycle 19 which is scheduled to begin in April 2008. Two of the LFAs were manufactured by Westinghouse Electric Company and contain a limited number of fuel rods with advanced zirconium-based alloys. The other two LFAs were manufactured by AREVA with fuel rods clad with M5^{TM} alloy. These cladding alloys do not fall within the definition of either Zircaloy or ZIRLO^{TM} (licensing basis of the approved ZIRLO^{TM} as described in WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report"). Both the Westinghouse and AREVA LFAs were inserted into the Unit 2 core in April 2003 (operating cycles 15 and 16) and removed during the spring 2007 refueling outage.

The second application (i.e., ADAMS ML070610357) requested changes that would modify TS 5.6.5, "Core Operating Limits Report (COLR)," for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, to reference WCAP-15604-NP, "Limited Scope High Burnup Lead Test Assemblies," as an approved analytical method for extended LFA burnup.

In addition, by letter dated February 23, 2007 (ADAMS ML070580107),the licensee proposed to operate Calvert Cliffs Unit No. 1 for operating cycle 19 with these four LFAs in core locations to permit higher burnups to evaluate fuel rod and fuel assembly performance at a projected peak pin burnup of up to 70 GWD/MTU.

2.0 REGULATORY EVALUATION

Section 50.46, "Acceptance criteria for emergency core cooling systems [ECCS] for light-water nuclear power plants," and Appendix K, "ECCS Evaluation Models," of Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR) identify requirements for calculating ECCS performance for reactors containing fuel with zircaloy or ZIRLO™ cladding. Section 50.44 of 10 CFR Part 50 discusses, in part, the generation of hydrogen gas from a metal-water reaction between the reactor coolant and reactor fuel having zircaloy or ZIRLO™ cladding.

By letter dated February 23, 2007 (ADAMS ML070580103), the licensee requested a temporary exemption from certain requirements in 10 CFR 50.46 and Appendix K to 10 CFR Part 50 because these regulations do not explicitly apply to the Westinghouse advanced zirconium-based alloy and the AREVA zirconium-based M5™ alloy. These cladding alloys do not fall within the definition of either Zircaloy or ZIRLO™ (licensing basis of the approved ZIRLO™ clad as described in Westinghouse Report WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report"). On December 17, 2007, the Nuclear Regulatory Commission (NRC) granted the exemption (ADAMS No. ML073200694) to the regulations cited above to allow use of these cladding materials in the LFAs to be inserted into the core of Calvert Cliffs Unit 1 for operating cycle 19. The environmental assessment supporting this exemption was published in the *Federal Register* on December 17, 2007 (72 FR 71449).

3.0 TECHNICAL EVALUATION

3.1 Background

The purpose of the LFA program is to obtain sufficient fuel performance data needed to justify that fuel assemblies with new and improved cladding materials will perform within the bounds assumed in safety analyses.

On April 14, 2003 (ADAMS No. ML031040504), the NRC staff issued Amendment Nos. 258 and 235 for Calvert Cliffs, Unit Nos. 1 and 2, which revised the TSs to permit operation of Calvert Cliffs Unit 2 for two operating cycles with a core containing up to eight LFAs with fuel rods clad with advanced zirconium-based alloys. On the basis of this amendment, the core for Calvert Cliffs Unit 2 incorporated four LFAs containing fuel rods clad with AREVA proprietary zirconium-based M5™ alloy and four LFAs containing fuel rods clad with Westinghouse proprietary advanced zirconium-based alloys, so that data could be obtained to support development of new and improved cladding materials and improved fuel evaluation codes and methods.

On November 16, 2006 (ADAMS No. ML062770207), the NRC staff issued Amendment Nos. 280 and 257 for Calvert Cliffs, Unit Nos. 1 and 2, which revised the TSs to permit operation of either Unit 1 or 2 with a core containing up to four LFAs, two Westinghouse LFAs and two AREVA LFAs, for a third cycle of operation. The licensee subsequently re-inserted the four LFAs, two Westinghouse LFAs and two AREVA LFAs, into the Unit 2 core during the April 2007 refueling outage. The remaining four LFAs, two Westinghouse LFAs and two AREVA LFAs, were discharged to the spent fuel pool for post-irradiation examinations.

By letter dated February 27, 2007, the licensee proposed to insert the remaining four LFAs, two Westinghouse LFAs and two AREVA LFAs, into the Unit 1 core for operating cycle 19 for a third cycle of operation. The licensee proposed to insert these LFAs in core locations to permit

higher burnups in order to evaluate fuel rod and fuel assembly performance beyond the current limit of 60 GWD/MTU up to a projected peak pin burnup of 70 GWD/MTU.

3.2 Proposed Change to TSs

Traditionally, the NRC staff uses two criteria for LFA programs, i.e., the number of LFAs should be limited and the core locations of LFAs should be non-limiting (not in the highest power regions). Recently, the staff endorsed the concept of locating LFAs next to the highest power or high-duty regions for simulating typical reactor operations. By letters dated January 8 (ADAMS No. ML030070476) and August 29, 2003 (ADAMS No. ML032410054), the staff approved Westinghouse's Topical Report WCAP-15604-NP, Rev. 1, "Limited Scope High Burnup Lead Test Assemblies," which provides the basis and guidelines for the operation of a limited number of LFAs for the high burnup irradiation program.

While the Westinghouse Owners Group submitted the WCAP referenced above, it was developed by representatives of the entire U.S. commercial reactor power industry and was intended to apply to all pressurized-water reactors and boiling-water reactors facilities. By letter dated November 21, 2000 (ADAMS No. ML003772968), the Nuclear Energy Institute requested that the WCAP be reviewed generically for the entire industry. The NRC staff reviewed this request and, in the above referenced letter dated January 8, 2003 (ADAMS ML030070476), agreed that all conclusions apply to the entire commercial nuclear power industry. Therefore, the results of this topical report are applicable to both the Westinghouse and AREVA LFAs. Thus, the licensee's request to extend the burnup limits of the LFAs is consistent with the approved report.

Based on the approved report and previous similar LFA irradiation performance, the staff concludes that the four LFAs are acceptable to extend the burnup limit to a peak rod average of up to 70 GWD/MTU for Calvert Cliffs Unit 1.

3.2.1 Section 4.2.1 Fuel Assemblies

The licensee proposes to add two sentences describing how the Unit 1 core will contain the LFAs with Westinghouse and AREVA cladding materials after the exemption is approved. The new sentences are stated as follows:

> For Unit 1 Cycle 19 only, advanced cladding material from AREVA may be used in up to two lead test assemblies as described in approved temporary exemption dated December 17, 2007. For Unit 1 Cycle 19 only, advanced cladding material from Westinghouse may be used in up to two lead test assemblies as described in approved temporary exemption dated December 17, 2007.

Since the sentences are consistent with the NRC staff position of the LFA application, the staff concludes that this revision is acceptable for Unit 1 Cycle 19.

3.2.2 Section 5.6.5 COLR

The licensee proposes to add Westinghouse Report WCAP-15604-NP, Rev. 1, to the list of references for Units 1 and 2. Since the NRC staff has previously reviewed and approved this report, the staff concludes that this revision is acceptable for Units 1 and 2.

3.3 Summary

The regulatory aspects for the use of cladding material other than zircaloy and ZIRLO™ were addressed separately in the licensee's request for exemption to 10 CFR 50.46 dated February 23, 2007. As noted above, the NRC granted this exemption on December 17, 2007. Therefore, the NRC staff finds this proposed TS change to be administrative in nature.

On the basis that the current TS 4.2.1 allows for the installation of a limited number of LFAs, the LFAs will remain within current peak rod burnup limits, and the standard reload analysis process will ensure that the predicted cladding performance will remain within that approved for Zircaloy-4 or ZIRLO™, the NRC staff finds the proposed changes 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 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 (72 FR 20377 and 72 FR 20378). Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact was published in the *Federal Register* on December 17, 2007 (72 FR 71449). Accordingly, based upon the environmental assessment, the Commission has determined that issuance of this amendment will not have a significant effect on the quality of the human environment.

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 Contributor: Shih-Liang Wu, NRR

Date: December 20, 2007