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GAS AND
ELECTRIC

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ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

October 15, 1982

Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

ATTENTION: Mr. R. A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit 2, Docket No. 50-318
Amendment to Operating License DPR-69
Fifth Cycle License Application

Gentlemen:

Baltimore Gas and Electric Company hereby requests an Amendment to Operating License DPR-69 to allow operation for a fifth cycle. The Enclosure to this letter presents discussions in support of the conclusion that the Safety Analyses discussed therein envelop and ensure conservative operation at a RATED THERMAL POWER of 2700 MWth.

Technical Specification Changes and Justification

The proposed changes to the Standard Technical Specifications (STS) required by this Amendment are described in Chapter 9.0 of the Enclosure to this letter and justified by discussions in Section 1.0 through 8.0 of the Enclosure.

Safety Analysis and Review

This proposed amendment and these proposed STS changes constitute an unreviewed safety question since the consequences of several Design Bases Events previously evaluated are slightly worse and because we propose some slightly less conservative bases for the Technical Specifications. However, the Enclosure presents analyses which demonstrate that acceptable limits on DNBR, fuel centerline temperature to melt, Reactor Coolant System upset pressure, and 10 CFR 100 site boundary dose rate guidelines would not be exceeded during a Design Bases Event.

Our present intention is to begin the Unit 2 refueling outage on October 15, 1982, and to complete the outage and begin the approach to criticality on January 15, 1983, with return to power operation immediately thereafter.

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The Plant Operations and Safety Review Committee (POSRC) and Offsite Safety and Review Committee (OSSRC) have reviewed this proposed Amendment and these proposed changes to the Standard Technical Specifications and have concluded that although they constitute an unreviewed safety question they do not present an undue risk to the health and safety of the public.

Very truly yours,

BALTIMORE GAS AND ELECTRIC COMPANY

A. E. Lundvall, Jr.
Vice President - Supply

WJL/AEL/fld

Enclosure (40 copies)

STATE OF MARYLAND, CITY OF BALTIMORE, TO WIT:

Arthur E. Lundvall, Jr., being duly sworn states that he is Vice President of the Baltimore Gas and Electric Company, a corporation of the State of Maryland; that he executed the foregoing Amendment for the purposes therein set forth; that the statements made in said Amendment are true and correct to the best of his knowledge, information, and belief; and that he was authorized to execute the Amendment on behalf of said Corporation.

WITNESS My Hand and Notarial Seal.

Ruth H. Kruse
Notary Public

cc: J. A. Biddison, Esquire
G. F. Trowbridge, Esquire
D. H. Jaffe
P. W. Kruse

Calvert Cliffs Unit 2 Cycle 5
Refueling License Amendment

Calvert Cliffs Unit 2 Cycle 5

Refueling License Amendment

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1.0 INTRODUCTION AND SUMMARY

This report provides an evaluation of design and performance for the operation of Calvert Cliffs Unit 2 during its fifth fuel cycle at full rated power of 2700 MWT. All planned operating conditions remain the same as those for Cycle 4. The core will consist of 128 presently operating F assemblies, 76 fresh Batch G assemblies and 13 D assemblies discharged from Calvert Cliffs Unit 2 Cycle 3.

Plant operating requirements have created a need for flexibility in the Cycle 4 termination point, ranging from 16,300 MWD/T to 17,300 MWD/T. In performing analyses of design basis events, determining limiting safety settings and establishing limiting conditions for operation, limiting values of key parameters were chosen to assure that expected Cycle 5 conditions would be enveloped, provided the Cycle 4 termination points fall within the above burnup range. The analysis presented herein will accomodate a Cycle 5 length of up to 14,000 MWD/T.

The evaluations of the reload core characteristics have been conducted with respect to the Calvert Cliffs Unit 1 Cycle 6 safety analysis described in Reference 1, as supplemented in Reference 2, hereafter referred to as the "reference cycle" in this report unless otherwise noted. This is an appropriate reference cycle because of the similarity in the basic system characteristics of the two reload cores. Reference 1 was the basic Unit 1 Cycle 6 license submittal. Reference 2 was a supplemental report which provided recommended Technical Specification changes to accommodate increased pressure transmitter uncertainties and a confirmation that the safety analyses would remain valid provided these changes were implemented.

Specific core differences have been accounted for in the present analysis. In all cases, it has been concluded that either the reference cycle analyses envelope the new conditions or the revised analyses presented herein continue to show acceptable results. Where dictated by variations from the previous cycle (Unit 2 Cycle 4, Reference 3), proposed modifications to the plant Technical Specifications are provided and are justified by the analyses reported herein. These proposed modifications are very similar to those proposed for the reference cycle (References 1 and 2).

The Cycle 5 average discharge exposure will be approximately 33,700 MWD/T, which is the same average discharge exposure as the reference cycle. Where appropriate, discussion concerning the average discharge exposure has been included. Since all analyses address fuel exposure explicitly, the average discharge exposure has been explicitly accounted for in the results of the Cycle 5 analyses presented herein.

2.0 OPERATING HISTORY OF THE REFERENCE CYCLE

Calvert Cliffs Unit 2 is presently operating in its fourth fuel cycle utilizing Batch D, E, and F fuel assemblies. Calvert Cliffs Unit 2 Cycle 4 began operation on March 11, 1981 and reached full power on March 22, 1981. The Cycle 4 startup testing was reported to the NRC in Reference 4. The reactor has operated up to the present time with the core reactivity, reactivity coefficients, power distributions and peaking factors having followed the calculated predictions very closely.

It is presently estimated that Cycle 4 will terminate on or about October 15, 1982. The Cycle 4 termination point can vary between 16,300 MWD/T and 17,300 MWD/T to accomodate the plant schedule and still be within the assumptions of the Cycle 5 analyses. As of October 7, 1982, the Cycle 4 burnup had reached 16,300 MWD/T.

3.0 GENERAL DESCRIPTION

The Cycle 5 core will consist of the number and types of assemblies and fuel batches as described in Table 3-1. The primary change to the core in Cycle 5 is the removal of 25 Batch D assemblies and 64 Batch E assemblies. These assemblies will be replaced by 48 Batch G (4.00 w/o enrichment) assemblies, 28 Batch G/ (3.55 w/o enrichment) assemblies and 13 Batch D assemblies discharged from Calvert Cliffs Unit 2 Cycle 3. The 28 Batch G/ assemblies contain 8 burnable poison pins per assembly. Figure 3-1 shows the fuel management pattern to be employed in Cycle 5. Figure 3-2 shows the locations of the poison pins within the lattice of once-burned Batch F/ assemblies and the fuel rod locations in unshimmed assemblies; Figure 3-3 shows the poison pin locations within the lattice of the fresh Batch G/ fuel. This fuel management pattern will accommodate Cycle 4 termination burnups from 16,300 MWD/T to 17,300 MWD/T.

The Cycle 5 core loading pattern is 90° rotationally symmetric. That is, if one quadrant of the core were rotated 90° into its neighboring quadrant, each assembly would be aligned with a similar assembly. This similarity includes batch type, number of fuel rods, initial enrichment and burnup.

Figure 3-4 shows the beginning of Cycle 5 assembly burnup distribution for a Cycle 4 termination burnup of 17,300 MWD/T. The initial enrichment of the fuel assemblies is also shown in Figure 3-4. Figure 3-5 shows the end of Cycle 5 assembly burnup distribution. The end of Cycle 5 core average exposure is approximately 25,600 MWD/T, and the average discharge exposure is approximately 33,700 MWD/T.

3.1 Prototype CEA

The prototype CEA is described in Reference 5. Cycle 3 was the first cycle of irradiation for this CEA. During the EOC-3 outage, this CEA was examined, as described in Reference 6, and then returned to the center core position for Cycle 4. This prototype CEA will continue to be utilized during Cycle 5.