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Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
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March 28, 1996

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
License Amendment Request: Change to the Moderator Temperature Coefficient

- REFERENCES:**
- (a) Letter from Mr. S. A. McNeil (NRC) to Mr. J. A. Tiernan (BGE), dated May 4, 1987, Issuance of Amendment 108 for Calvert Cliffs Unit 2
 - (b) Letter from Mr. S. A. McNeil (NRC) to Mr. J. A. Tiernan (BGE), dated May 16, 1988, Unit 1 Cycle 10 Technical Specification Amendment (TAC No. 67143)
 - (c) Letter from Mr. S. A. McNeil (NRC) to Mr. J. A. Tiernan (BGE), dated March 11, 1988, Request for Additional Information - Unit 1 Cycle 10 Reload (TAC 67143)
 - (d) Letter from Mr. S. A. McNeil (NRC) to Mr. J. A. Tiernan (BGE), dated November 2, 1988, Safety Evaluation Concerning Conformance to the ATWS Rule (TAC Nos. 59079 and 59080)

Pursuant to 10 CFR 50.90, the Baltimore Gas and Electric Company (BGE) hereby requests an amendment to Operating License Nos. DPR-53 and DPR-69 to reduce the moderator temperature coefficient (MTC) limit shown on Technical Specification Figure 3.1.1-1. This proposed change is necessary to support changes in the safety analyses made to accommodate a larger number of plugged steam generator (SG) tubes for future operating cycles. In addition, we are providing information to clarify the relationship of MTC to an Anticipated Transient Without Scram event in our licensing basis.

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BACKGROUND

As the SGs at Calvert Cliffs age, it may be necessary to plug additional SG tubes. One of the inputs into several of the safety analyses is the amount of heat transfer area available in the secondary system. Therefore, the number of SG tubes plugged impacts these safety analyses. To ensure that the safety analyses remain bounding, we assume that the number of tubes plugged are greater than the number we expect to have plugged during the operating cycle. It is, therefore, necessary to increase the number of SG tubes that are assumed plugged in appropriate safety analyses to support the potential need to plug additional SG tubes. For several of the safety analyses supporting Unit 1 Cycle 13 and Unit 2 Cycle 11 operation, BGE has assumed an increased number of plugged SG tubes. Unit 1 Cycle 13 operation is planned to begin in spring 1996, and Unit 2 Cycle 11 is currently in progress.

REQUESTED CHANGE

The safety analyses for the current fuel cycles assume 500 tubes per SG are plugged and the maximum beginning-of-cycle MTC is assumed to follow the curve in Technical Specification Figure 3.1.1-1. If we need to plug additional tubes during the outage, that could take us beyond the current limit (500 tubes). Increasing the number of SG tubes assumed to be plugged in the analyses to above 500 reduces the calculated heat transfer area from the Reactor Coolant System (RCS) to the secondary side of the SG. This causes a larger increase in RCS temperature and pressure during certain plant heatup events. In order to mitigate the RCS pressure and temperature increase for these events with an increased number of plugged SG tubes, it is necessary to credit a more restrictive (less positive) limit on the maximum positive MTC in these analyses. A less positive MTC results in reduced core reactivity during plant heatup events. This reduced core reactivity mitigates the increase in RCS temperature and pressure during these events.

The limitations on MTC are provided to ensure that the assumptions used in the accident analyses remain valid for each fuel cycle. Four analyses are affected by the change in the assumption regarding the number of plugged SG tubes and require a compensating decrease in MTC. They are the Loss of Load, Loss of Feedwater Flow, Feed Line Break, and Control Element Assembly Withdrawal events (Updated Final Safety Analysis Report Sections 14.5, 14.6, 14.26, and 14.2). These analyses were reanalyzed using approved methodologies to determine the effect of the change in plugged SG tubes. The results of the analyses remain within the previously approved limits. The change to the MTC limit more than offsets the effects of the increased number of plugged SG tubes. We are proposing a change to the allowable positive MTC limits shown on Technical Specification Figure 3.1.1-1. The proposed limit will be more restrictive than the existing limit (see marked-up pages in Attachments 2 and 3) to match the assumptions used in the events listed above.

CLARIFICATION OF THE LICENSING BASIS

Technical Specification 3.1.1.4 allows full power operation with a positive MTC; however, an outstanding commitment existed related to anticipated transient without scram (ATWS) compliance to design reactor cores with a negative full power MTC at equilibrium xenon conditions. References (a) and (b) indicate our commitment to the Nuclear Regulatory Commission (NRC) to design cores with a negative full power MTC to ensure that if there were an ATWS event, the acceptable margin of safety would not be

compromised. As discussed in Reference (c), this commitment was made in lieu of an evaluation of a positive MTC on the safety margin provided for an ATWS event. An alternative to evaluating the effect of an ATWS event on the reactor core is to install the mitigating features required by the ATWS rule (10 CFR 50.62). At the time that References (a) and (b) were issued, we had not completed installation of our ATWS mitigation hardware. Therefore, since that time, BGE has implemented the commitment to design cores with a negative full power MTC. The predicted and measured full power MTC at equilibrium xenon conditions has been negative on both Units since 1987.

Since then, BGE has implemented the long-term ATWS resolution by installing the Diverse Scram System on both Unit 1 and Unit 2. This system has been reviewed and accepted by NRC (Reference d) as meeting the requirements of 10 CFR 50.62. Based on installing the Diverse Scram System as the long-term resolution to ATWS, it is no longer necessary for BGE to design cores such that the full power MTC is negative. Therefore, BGE considers this proposed Technical Specification limit on the maximum positive MTC to be the sole MTC limitation for core design and operation. This consideration has little real effect on how BGE will design cores in the future since some margin to the proposed MTC limit of $+ 0.15 \times 10^{-4} \Delta\rho/\rho_F$ will be preserved in the design process. However, considering this proposed Technical Specification limit on the maximum positive MTC as the sole requirement for core design and operation, with respect to a limit on positive MTC, clarifies our current licensing basis.

SCHEDULE

Baltimore Gas and Electric Company does not consider NRC approval of this change to the Technical Specifications necessary prior to startup for Unit 1 Cycle 13 operation (spring 1996). Administrative procedures at the plant will be changed to ensure the proposed MTC limit is met during Unit 1 Cycle 13 operation. The current predicted maximum full power MTC for Unit 1 Cycle 13 at equilibrium xenon conditions is negative. Technical Specifications will not be violated during operation of Unit 1 Cycle 13 without this change. However, in order for the Technical Specifications to remain consistent with safety analysis assumptions, we request that this change be approved by September 1, 1996. Baltimore Gas and Electric Company requests that this change be made to both the Unit 1 and Unit 2 Technical Specifications at this time since the safety analyses supporting an increase in the number of plugged SG tubes are applicable to both Units 1 and 2. The current full power MTC for Unit 2 is negative and will become more negative as the cycle progresses.

We have evaluated the significant hazards considerations associated with this change as required by 10 CFR 50.92, and determined that there are none (see Attachment 1 for a complete discussion). We have also determined that operation with the proposed amendment would not result in any significant change in the types or significant increases in the amounts of any effluents that may be released offsite. It also would not result in a significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment is eligible for categorical exclusion as set forth in 10 CFR 51.22(c)(9). The Plant Operations and Offsite Safety Review Committees have reviewed the proposed change and concurred that the change will not result in an undue risk to the health and safety of the public.

Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

Charles H. Cruse

STATE OF MARYLAND :
: TO WIT :
COUNTY OF CALVERT :

I hereby certify that on the 28th day of March, 1996, before me, the subscriber, a Notary Public of the State of Maryland in and for Calvert County, personally appeared Charles H. Cruse, being duly sworn, and states that he is Vice President of the Baltimore Gas and Electric Company, a corporation of the State of Maryland; that he provides the foregoing response for the purposes therein set forth; that the statements made are true and correct to the best of his knowledge, information, and belief; and that he was authorized to provide the response on behalf of said Corporation.

WITNESS my Hand and Notarial Seal:

Denise D. Smith
Notary Public
2/2/98
Date

My Commission Expires:

CHC/PSF/dlm

- Attachments: (1) Determination of Significant Hazards
- (2) Unit 1 Marked-Up Technical Specification Page
- (3) Unit 2 Marked-Up Technical Specification Page

- cc: D. A. Brune, Esquire
- J. E. Silberg, Esquire
- L. B. Marsh, NRC
- D. G. McDonald, Jr., NRC
- T. T. Martin, NRC
- Resident Inspector, NRC
- R. I. McLean, DNR
- J. H. Walter, PSC

ATTACHMENT (1)

DETERMINATION OF SIGNIFICANT HAZARDS

**Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
March 28, 1996**