April 6, 1989

Docket No. 50-318

DISTRIBUTION
Docket File
NRC PDR
Local PDR
PDI-1 RF
SAVarga
BABoger
CVogan
OGC-WF
DHagan
ACRS (10)
SMcNeil
GPA/PA

Mr. G. C. Creel
Vice President-Nuclear Energy
Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
MD Rts. 2 & 4
P. O. Box 1535
Lusby, Maryland 20657

Dear Mr. Creel:

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 2 - NOTICE OF CONSIDERATION OF ISSUANCE OF AMENDMENT (TAC NO. 72037)

Enclosed is a copy of a "Notice of Proposed No Significant Hazards Consideration Determination and Opportunity for Hearing" for your information. This notice relates to your February 12, 1988 and February 7, 1989 applications to support Unit 2 Cycle 9 operation. This notice was published as an "Individual Notice" rather than a "Bi-weekly Notice" to support your operating cycle and ensure a full 30-day notice period before issuance of any amendments.

Sincerely,

ORIGINAL SIGNED BY

Scott Alexander McNeil, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc: See next page

[TAC 72037]

PDI-1	PDI-1	PDI-1
CVogan	SMcNeil:ah	RACapra
04/6/89	04/06/89	04/6/89

DFO1

8904170248 890406
PDR ADOCK 05000318
P PNU

Mr. G. C. Creel
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant

cc:

Mr. William T. Bowen, President
Calvert County Board of
Commissioners
Prince Frederick, Maryland 20768

D. A. Brune, Esq.
General Counsel
Baltimore Gas and Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Mr. Jay E. Silberg, Esq.
Shaw, Pittman, Potts and Trowbridge
1800 M Street, NW
Washington, DC 20036

Mr. W. J. Lippold, General Supervisor
Technical Services Engineering
Calvert Cliffs Nuclear Power Plant
MD Rts 2 & 4, P. O. Box 1535
Lusby, Maryland 20657

Resident Inspector
c/o U.S.Nuclear Regulatory Commission
P. O. Box 437
Lusby, Maryland 20657

Department of Natural Resources
Energy Administration, Power Plant
Siting Program
ATTN: Mr. T. Magette
Tawes State Office Building
Annapolis, Maryland 21204

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

UNITED STATES NUCLEAR REGULATORY COMMISSION

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-318

NOTICE OF CONSIDERATION OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE AND PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION AND OPPORTUNITY FOR HEARING

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. DPR-69, issued to the Baltimore Gas and Electric Company (the licensee), for operation of the Calvert Cliffs Nuclear Power Plant, Unit No. 2 located in Calvert County, Maryland.

The amendment would make the following changes in accordance with the licensee's applications for amendment dated February 12, 1988 and February 7, 1989:

1. Increase the minimum required shutdown margin of Technical Specification (TS) Limiting Condition for Operation (LCO) 3.1.1.1 above the currently required +3.5 delta k/k in accordance with the linear progression where the shutdown margin limit shall be greater than or equal to +[3.5 + 1.5(P)] delta k/k where P is the fraction of core life. Thus, at 0% core life (beginning of life) the shutdown margin limit is +3.5 delta k/k but at 100% core life (end of core life) the limit is +5.0 delta k/k.
2. Change the TS Figure 3.1-2, "CEA Group Insertion Limits vs. Fraction of Allowable Thermal Power for Existing RCP Combination," Bank 5 Transient Insertion Limit from the linear progression with values of 25% insertion at 90% rated thermal power (RTP) and 35% insertion at 100% RTP to a constant insertion limit of 35% between 90% and 100% RTP.

3. Reduce unnecessary Axial Shape Index (ASI) trips below 70% RTP and provide additional operating flexibility by:

   a. modifying TS Figure 2.2-1, "Peripheal Axial Shape Index vs. Fraction of Rated Thermal Power," by altering the acceptable operation region below 70% RTP to the area bounded by the linear equations for the ASI limits, where

      (1) ASI limit = ±0.6 at powers below 40% RTP,

      (2) ASI limits = +[.6 + 2/3 (.4-P] and -[.6 + .7 (.4-P)] (where P is the fraction of RTP) between 40% and 100% RTP, and

      (3) ASI limits = - 18/17 (1.17-P) and + 20/17 (1.17-P) between 100% and 117% RTP (where P is the fraction of RTP).

   The current ASI limits are ±0.4 at powers below 70% RTP, ±[.4 + 2/3 (.7-P)] between 70% and 100% RTP, and ±(1.2-P) between 100% and 120% RTP (where P is the fraction of RTP);

   b. expanding the acceptable operation region of TS Figure 3.2-2, "Linear Heat Rate Axial Flux Offset Control Limits," and TS Figure 3.2-4, "DNB Axial Flux Offset Control Limits," by increasing the negative ASI limit below 50% RTP from the current value of -0.3 to

(1) the linear equation limit, between 15% and 50% RTP, of the negative ASI limit = -[0.3 + 3/7 (.5-P)], where P is the fraction of RTP;

(2) below 15% RTP, the negative ASI limit = -0.45.

4. Reflect the lowering of the departure from nucleate boiling ration (DNBR) limit to 1.15 due to the incorporation of an extended statistical combination of uncertainties methodology through modifying Figures 2.2-2, "Thermal Margin/Low Pressure Trip Setpoint Part 1 (ASI v. A_1)," and 2.2-3, "Thermal Margin/Low Pressure Trip Setpoint Part 2 (Fraction of Rated Thermal Power v. QR_1)," by

a. changing the equation for the pressure variable trip from
$P\ (\text{TRIP VAR}) = 2061\ (Q_{DNB}) + 15.85\ (T_{IN}) - 8915$
to $P\ (\text{TRIP VAR}) = 2892\ Q_{DNB} + 17.16\ (T_{IN}) - 10682$;

b. changing Q_{DNB}, which equals $QR_1 \times A_1$, by increasing QR_1 from the values of

$QR_1 = .235 + (628/781)\ P$ between 0% and 78.1% RTP

$QR_1 = .863 - (109/191) \times (P-.781)$ between 78.1% and 97.2% RTP

$QR_1 = P$ above 97.2% RTP

to

$QR_1 = .3 + (11/12)\ P$ between 0% and 60% RTP

$QR_1 = .85 + (3/8) \times (P-.6)$ between 60% and 100% RTP

$QR_1 = P$ above 100% RTP

where P is the fraction of RTP.

5. Modify LCO 3.1.3.1 Action Statements f and g and TS Figure 3.1-3, "Allowable Time to Realign CEA Versus Initial Total Integrated Radial Peaking Factor," to raise the maximum peaking factor allowed for the uppermost CEA realignment time of 60 minutes from a value of 1.53 to a higher peaking factor of 1.57. Similarly, the minimum peaking factor for which no CEA realignment time is permitted would be increased from 1.63 to 1.67. The linear equation for radial peaking factor versus CEA realignment time would be changed from (978 - 600 F_r^T) minutes to (1002 - 600 F_r^T) minutes, where F_r^T is the initial total integrated radial peaking factor. In addition, if a time allowance is available from the Better Axial Shape Selection System (BASSS), it would be used vice the time allowance provided by TS Figure 3.1-3.

6. Reduce the allowable peak linear heat generation rate (APLHR) of TS Figure 3.2-1, "Allowable Peak Linear Heat Rate vs. Burnup," from a maximum value of 15.5 kw/ft to a new value of 15.2 kw/ft.

7. Reduce the maximum allowable fraction of RTP for operation with peaking factors above 1.785, as provided in TS Figure 3.2-3b, "Total Planar Radial Peaking Factor vs. N," from a value of [1-200 (F_{xy}^T - 1.54)/245] to [1-200 (F_{xy}^T - 1.54)/285], where P is the fraction of rated thermal power and F_{xy}^T is the total planar radial peaking factor.

8. a. Modify Action Statement a of LCO 3.2.2.1 [LCO 3.2.3] to allow thermal power to be reduced within 6 hours to the power limit provided by BASSS as a function of F_{xy}^T [F_r^T] when F_{xy}^T [F_r^T] is greater than 1.70.

b. Delete the equation for F^T_{xy} [F^T_r] from LCO 3.2.2.1 [LCO 3.2.3] and modify this equation in Surveillance Requirements 4.2.2.1.2 and 4.2.2.2.2 [4.2.3.2] such that (1) $F^T_{xy} = F_{xy}(1 + T_q)$ [$F^T_r = F_r(1 + T_q)$], when F_{xy} [F_r] is determined with a non-full core power distribution mapping system and (2) $F^T_{xy} = F_{xy}$ [$F^T_r = F_r$], when F_{xy} [F_r] is determined with a full core power distribution mapping system. T_q is the azimuthal power tilt.

c. Change TS Surveillance Requirements 4.2.2.1.3 and 4.2.2.2.3 [4.2.3.3] to require determinations of F^T_{xy} [F^T_r] instead of F_{xy} [F_r] for each instance a calculation is required by TS 4.2.2.1.2 and 4.2.2.2.2 [4.2.3.2].

d. Require T_q calculations, as specified by TS Surveillance Requirements 4.2.2.1.4 and 4.2.2.2.4 [4.2.3.4] for only instances where F^T_{xy} [F^T_r] is determined through use of a non-full core power distribution mapping system.

e. Raise the LCO 3.2.3 limit for F^T_r from .165 to 1.70 and modify the maximum allowable RTP limits for F^T_r values above 1.70 to those provided through the linear equation RTP = $1 - 200(1.7 - F^T_r)/85$.

9. Change the nomenclature of the DNB parameter of LCO 3.2.5 and TS Table 3.2-1, "DNB Parameters," from "Axial Shape Index, Core Power" to "Axial Shape Index, Thermal Power."

10. Add a new TS Surveillance Requirement 4.2.5.3 to permit the use of BASSS to monitor thermal power as a function of axial shape index. BASSS monitoring would be limited to CEA insertions of the lead bank of less than or equal to 55%.

11. Raise the maximum auxiliary feedwater (AFW) flow that can be accommodated through the AFW suction line, with one unit requiring flow, prior to pump cavitation due to low net positive suction head, from 1300 gpm to 1550 gpm. This flow condition is specified in TS Basis 3/4.7.1.2, "Auxiliary Feedwater System," for initial automatic response to a main steam line break design basis event.

12. Increase the TS 5.3.1 U-235 enrichment limit for fuel assemblies in the reactor core from 4.1 to 4.35 weight percent U-235.

Before issuance of the proposed license amendment, the Commission will have made findings required by the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations.

The Commission has made a proposed determination that the amendment request involves no significant hazards considerations. Under the Commission's regulations in 10 CFR 50.92, this means that operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The licensee evaluated the proposed changes against the standards in 10 CFR 50.92 and has determined that the amendment would not:

(1) involve a significant increase in the probability or consequences of an accident previously evaluated ...

"All the non-LOCA transient safety analyses for Unit 2 Cycle 9 are bounded by previously presented and approved analyses. All key transient input parameters of the Cycle 9 non-LOCA analyses are conservative with respect to the previously approved reference cycle values (Unit 1 Cycle 10), with the exception of the following parameters:

> Unit 2 Cycle 9 Batch L fuel utilizes a small flow hole debris-resistant design on each of the 92 fresh fuel assemblies.
>
> The maximum Auxiliary Feedwater (AFW) flow assumed for Unit 2 Cycle 9 safety analyses was increased from 1300 gpm for the reference cycle to 1550 gpm.
>
> The maximum assumed number of plugged U-tubes per steam generator was increased to 500 plugged tubes for all non-LOCA Cycle 9 analyses.

The analyses and evaluations performed on those Design Basis events affected by these input parameters changes indicate that the results are abounded by those presented in the reference cycle.

An ECCS performance analysis (large and small break LOCA) was performed for Unit 2 Cycle 9 wherein compliance with the acceptance criteria of 10 CFR 50.46 is demonstrated. The debris-resistant Batch L lower end fitting design and a reduction of 260 gpm in assumed Low Pressure Safety Injection (LPSI) flow was considered in The Cycle 9 ECCS analysis. The large break LOCA analysis assumes 500 plugged U-tubes per steam generator, whereas the small break LOCA analysis assumes only 150 plugged U-tubes per steam generator. Both the large and small break LOCA's are conservatively bounded by the reference cycle analyses.

Since the results of the Unit 2 Cycle 9 analyses are all conservatively bounded by the reference cycle, and due to the nature of the changes to the three inputs to the safety analyses addressed above, the Unit 2 Cycle 9 core reload does not present a significant hazards consideration with respect to the existing safety analyses. The Cycle 9 reload does not involve an increase in the probability or consequences of an accident previously evaluated."

(ii) create the possibility of a new of different type of accident from

any accident previously evaluated ...

"The proposed amendment does not create the possibility of a new or different kind of accident from any previously evaluated. The design of Unit 2 Cycle 9 closely follows that of the reference cycle, Unit 1 Cycle 10. The four Er_2O_3 lead demonstration assemblies, included in the Cycle 9 core, do not impact the core design in any adverse manner. All nuclear, mechanical, thermal-hydraulic, and transient (LOCA and non-LOCA) safety analyses performed for the Unit 2 Cycle 9 reload core design considered the lead demonstration assemblies. These lead demonstration assemblies are discussed in the attachment to this request for license amendment. Several fuel mechanical design changes are included in the Batch L design and are addressed individually.

The mechanical design of each assembly in the Batch L reload fuel is identical to the Batch M fuel previously inserted in Calvert Cliffs Unit 1 with the following noted exceptions:

> The Batch L lower end fitting flow hole configuration has been modified to a new smaller hole, more debris-resistant design. In this design, nine small, chamfered holes replace each of the larger holes in the reference cycle design, thus forming a smaller diameter flow path more restrictive to the intrusion of reactor coolant system debris into the fuel assembly.
>
> The debris-resistant lower end fitting design used in the Batch L reload fuel has also been considered in all aspects of the nuclear, mechanical, thermal-hydraulic, and transient (LOCA and non-LOCA) safety analyses for Unit 2 Cycle 9. Each of these areas considered the impact of increased core differential pressure due to the introduction of a smaller hole design. It was determined that a new accident type would not result from the smaller hole lower end fitting. Reactor coolant system flow is maintained and individual assembly flow is not adversely affected. The impact of the flow both through the assemblies with the small hole debris-resistant design and the other 125 standard hole lower end fittings were analyzed to determine whether the presence of the more flow restrictive design causes an imbalance in the inlet flow to the other assemblies. It was determined that no significant impact or imbalance occurs for the Unit 2 Cycle 9 design.

The fuel rod plenum spring in the Batch L fuel has been redesigned to maximize the available rod internal void volume. This modification helps reduce high end cycle (EOC) internal gas pressures.

> It has been determined that the fuel rod plenum spring in the Batch L fuel will in no way increase the probability to cause a new or different kind of accident than has previously been evaluated. The design is materially the same as used in previously approved CE nuclear fuel. It is dimensionally different to take up less volume in the plenum of the fuel rod, thereby making more volume available for internal fission gas

expansion. This spring is provided in each fuel rod to ensure integrity of the fuel pellet stack during the fuel shipping process. It prevents fuel pellet separation.

The overall length of the Batch L B_4C burnable poison rod has been increased so that the poison rod length is now the same as the fuel rod length. This allows the same type cladding tube to be used for both rod types.

All the fuel to be loaded in Cycle 9 was reviewed to ascertain that adequate shoulder gap clearance exists. Analyses were performed with approved models and it was concluded that all shoulder gap and fuel assembly length clearances are adequate for Cycle 9 operation. Using the same cladding tube for the burnable poison rods as is used for the fuel rods has been shown to be acceptable after analysis of expected rod growth using accepted analysis methods, confirmed by visual examination of fuel assemblies with burnups in excess of those expected for Batch L fuel.

The size and number of crimp holes in the upper end of each of the five guide tubes of each Batch L assembly have been modified. This design change allows the fuel assembly upper end fitting guide tube posts to be reusable if the assembly must be disassembled for fuel rod reconstitution.

This modification allows easier fuel assembly reconstitution and does not affect the mechanical strength of the fuel assembly upper end fitting and guide tube post assembly. The ability of the guide posts to hold the upper end fitting of the assembly in place is not altered by the crimp hole design modification. No new or different accident is created by the introduction of this design modification."

(iii) involve a significant reduction in a margin of safety.

"No margins of safety for the Unit 2 Cycle 9 reload core design are reduced with respect to the previously reported and approved reference cycle. With each proposed Technical Specification change, sufficient conservatism or margin of safety remains between the proposed limits of the changes and actual safety limits (Specified Acceptable Fuel Design Limits - SAFDL's). In fact the margin previously reported in the reference cycle is applicable to Unit 2 Cycle 9."

Based upon the above, the NRC staff proposes to determine that the TS changes proposed for the Unit 2 Cycle 9 reload involve no signficant hazards considerations.

The Commission is seeking public comments on this proposed determination. Any comments received within 30 days after the date of publication of this notice will be considered in making any final determination. The Commission will not normally make a final determination unless it receives a request for a hearing.

Comments should be addressed to the Secretary of the Commission, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attn: Docketing and Service Branch.

By May 12, 1989 , the licensee may file a request for a hearing with respect to issuance of the amendment to the subject facility operating license and any person whose interest may be affected by this proceeding and who wishes to participate as a party in the proceeding must file a written petition for leave to intervene. Requests for a hearing and petitions for leave to intervene shall be filed in accordance with the Commission's "Rules of Practice for Domestic Licensing Proceedings" in 10 CFR Part 2. If a request for a hearing or petition for leave to intervene is filed by the above date, the Commission or an Atomic Safety and Licensing Board, designated by the Commission or by the Chairman of the Atomic Safety and Licensing Board Panel, will rule on the request and/or petition and the Secretary or the designated Atomic Safety and Licensing Board will issue a notice of hearing or an appropriate order.

As required by 10 CFR §2.714, a petition for leave to intervene shall set forth with particularity the interest of the petitioner in the proceeding, and how that interest may be affected by the results of the proceeding. The petition should specifically explain the reasons why intervention should be permitted with particular reference to the following factors: (1) the nature of the petitioner's right under the Act to be made a party to the proceeding; (2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding; and (3) the possible effect of any order which may be entered in the proceeding on the petitioner's interest. The petition should also identify the specific aspect(s) of the subject matter of the proceeding as to which petitioner wishes to intervene. Any person who has filed a petition for leave to intervene or who has been admitted as a party may amend the petition without requesting leave of the Board up to fifteen (15) days prior to the first prehearing conference scheduled in the proceeding, but such an amended petition must satisfy the specificity requirements described above.

Not later than fifteen (15) days prior to the first prehearing conference scheduled in the proceeding, a petitioner shall file a supplement to the petition to intervene, which must include a list of the contentions which are sought to be litigated in the matter, and the bases for each contention set forth with reasonable specificity. Contentions shall be limited to matters within the scope of the amendment under consideration. A petitioner who fails to file such a supplement which satisfies these requirements with respect to at least one contention will not be permitted to participate as a party.

Those permitted to intervene become parties to the proceeding, subject to any limitations in the order granting leave to intervene, and have the opportunity to participate fully in the conduct of the hearing, including the opportunity to present evidence and cross-examine witnesses.

If a hearing is requested, the Commission will make a final determination on the issue of no significant hazards consideration. The final determination will serve to decide when the hearing is held.

If the final determination is that the amendment request involves no significant hazards consideration, the Commission may issue the amendment and make it effective, notwithstanding the request for a hearing. Any hearing held would take place after issuance of the amendment.

If the final determination is that the amendment request involves a significant hazards consideration, any hearing held would take place before the issuance of any amendment.

Normally, the Commission will not issue the amendment until the expiration of the 30-day notice period. However, should circumstances change during the notice period, such that failure to act in a timely way would result, for example, in derating or shutdown of the facility, the Commission may issue the license amendment before the expiration of the 30-day notice period, provided that its final determination is that the amendment involves no significant hazards consideration. The final determination will consider all public and State comments received. Should the Commission take this action, it will publish a notice of issuance and provide for opportunity for a hearing after issuance. The Commission expects that the need to take this action will occur very infrequently.

A request for a hearing or a petition for leave to intervene must be filed with the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch, or may be delivered to the Commission's Public Document Room, Gelman Building, 2120 L Street, N.W., Washington, D.C., by the above date. Where petitions are filed during the last ten (10) days of the notice period, it is requested that the petitioner promptly so inform the Commission by a toll-free telephone call to Western Union at 1 (800) 325-6000 (in Missouri 1 (800) 342-6700). The Western Union operator should be given Datagram Identification Number 3737 and the following message addressed to Robert A. Capra: petitioner's name and telephone number; date petition was mailed; plant name; and publication date and page number of this FEDERAL REGISTER notice. A copy of the petition should also be sent to the Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, and to D. A. Brune, Jr., General Counsel, Baltimore Gas & Electric Company, P. O. Box 1475, Baltimore, Maryland 21203, attorney for the licensee.

Nontimely filings of petitions for leave to intervene, amended petitions, supplemental petitions and/or requests for hearing will not be entertained absent a determination by the Commission, the presiding officer or the Atomic Safety and Licensing Board designated to rule on the petition and/or request, that the petitioner has made a substantial showing of good cause for the granting of a late petition and/or request. That determination will be based upon a balancing of the factors specified in 10 CFR 2.714(a)(1)(i)-(v) and 2.714(d).

For further details with respect to this action, see the applications for amendment which are available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, N.W., Washington, D.C. 20555, and at the Local Public Document Room, Calvert County Library, Prince Frederick, Maryland.

Dated at Rockville, Maryland, this 6th day of April 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

Scott Alexander McNeil

Scott Alexander McNeil, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

For further details with respect to this action, see the applications for amendment which are available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, N.W., Washington, D.C. 20555, and at the Local Public Document Room, Calvert County Library, Prince Frederick, Maryland.

Dated at Rockville, Maryland, this 6th day of April 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

Scott Alexander McNeil

Scott Alexander McNeil, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

PDI-1
CVogan
04/6/89

PDI-1
SAMcNeil
04/6/89

PDI-1
RACapra
04/6/89