



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 21, 1994

Mr. Robert E. Denton
Vice President - Nuclear Energy
Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: ISSUANCE OF AMENDMENTS FOR CALVERT CLIFFS NUCLEAR POWER PLANT,
UNIT NO. 1 (TAC NO. M88191) AND UNIT NO. 2 (TAC NO. M88192)

Dear Mr. Denton:

The Commission has issued the enclosed Amendment No.200 to Facility Operating License No. DPR-53 and Amendment No. 177 to Facility Operating License No. DPR-69 for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Updated Final Safety Analysis (UFSAR) in response to your application transmitted by letter dated November 4, 1993.

These amendments revise various UFSAR sections to address the removal of an orifice plate in the containment vent/purge line to allow greater flow through the line. The restoration of full-flow capability will result in less time required to vent the containment. A reanalysis of the maximum hypothetical accident was performed to support the requested amendments. The results of the reanalysis indicate that the consequences of the accident previously analyzed would be increased. Although the consequences result in an increase in the fission product release, the total doses are well within the limits of 10 CFR Part 100.

These amendments are being issued pursuant to the requirements of 10 CFR 50.59(c) because the review of Baltimore Gas and Electric Company identified the change as an unreviewed safety question. No changes to the Technical Specifications are required by these amendments.

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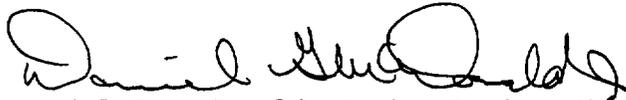
R. Denton

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October 21, 1994

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,



Daniel G. McDonald, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-317
and 50-318

Enclosures: 1. Amendment No. 200 to DPR-53
2. Amendment No. 177 to DPR-69
3. Safety Evaluation

cc w/encs: See next page

R. Denton

-2-

October 21, 1994

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,

Original signed by

Daniel G. McDonald, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-317
and 50-318

Enclosures: 1. Amendment No. ²⁰⁰ to DPR-53
2. Amendment No. ¹⁷⁷ to DPR-69
3. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION: See attached sheet

*See previous concurrence

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DATE	10/17/94		10/17/94 <i>(Signature)</i>		09/22/94		09/29/94		10/21/94	

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Mr. Robert E. Denton
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 and 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 200
License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated November 4, 1993, 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, by Amendment No. 200, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR) as set forth in the application for amendment by the licensee dated November 4, 1993. The licensee shall update the UFSAR to reflect the removal of the orifice plate in the containment vent/hydrogen purge system and revise the maximum hypothetical accident analysis to address the increased flow as the result of the removal of the orifice plate, as authorized by this amendment, in accordance with 10 CFR 50.71(e).

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3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Ledyard B. Marsh, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Date of Issuance: October 21, 1994



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177
License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated November 4, 1993, 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, by Amendment No. 177, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR) as set forth in the application for amendment by the licensee dated November 4, 1993. The licensee shall update the UFSAR to reflect the removal of the orifice plate in the containment vent/hydrogen purge system and revise the maximum hypothetical accident analysis to address the increased flow as the result of the removal of the orifice plate, as authorized by this amendment, in accordance with 10 CFR 50.71(e).

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Ledyard B. Marsh, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Date of Issuance: October 21, 1994



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 200 TO FACILITY OPERATING LICENSE NO. DPR-53
AND AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-69
BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

By letter dated November 4, 1993, Baltimore Gas and Electric Company (the licensee/BG&E) submitted a license amendment request for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, to revise the Updated Final Safety Analysis Report (UFSAR). The requested change would allow the removal of an orifice in the 4-inch containment vent/purge line resulting in greater flow. The Unit 1 containment and the Unit 2 containment each have a separate but identical system. Penetration room exhaust fans in the auxiliary building draw air through an in-containment moisture separator and an in-containment motor-operated valve (MOV). The air is passed through the auxiliary building via the vent lines which have an outside containment MOV, flow reducing orifice, a flow monitoring system, a motor-operated butterfly valve, and a set high efficiency particulate air and two charcoal filters in parallel (the penetration room ventilation system filter bank). The air is then discharged by the fans through the main plant vent. Vented air is replaced through a separate penetration.

The use of this system as a containment vent was approved by Technical Specification (TS) Amendment Nos. 115 and 98 for Unit Nos. 1 and 2, respectively, dated February 20, 1986. The maximum hypothetical accident doses in the UFSAR, Chapter 14.42, were revised to include venting of the containment at the initiation of an accident. The NRC staff's Safety Evaluation (SE) which supported TS Amendment Nos. 115 and 98 also approved the higher calculated offsite dose than was currently described in the UFSAR at that time. Subsequently, BG&E identified calculational errors in the offsite dose, which when corrected, indicate an offsite dose higher than that approved in the NRC staff's SE. An orifice plate with a 1-inch opening was installed in each of the vent lines in order to maintain the approved offsite dose levels.

2.0 EVALUATION

Restoration of full-flow capability to the 4-inch vent/purge lines by removing the orifice plates will significantly reduce the time required to vent or

purge. It now takes 7 times longer to vent a containment than it did with a 4-inch line (28 hours versus 4 hours). In addition, venting now occurs over three operating shifts instead of being completely contained within one shift. Venting is a manually controlled operation, in that it requires operator attention (the operator opens and closes the valves from the control room). Stretching the venting over three shifts introduces the possibility of additional human error into the venting process. Another consideration is that the probability of an accident occurring during venting decreases with decreased vent time. Reducing the venting time will not increase the number of times BG&E needs to vent, because the starting and ending conditions for venting remain the same. Therefore, the total amount of time the containment vents would be open will be decreased.

Reanalyses have been performed to support the removal of the orifice plates which indicate that the offsite dose would be increased. Although the consequences of the maximum hypothetical accident would result in an increase in the fission product release, the total dose is well within the limits of 10 CFR Part 100. Fission products would be released until the in-containment and outside containment isolation valves receive a safety injection actuation signal or a containment radiation signal which would close the valves isolating the vent line.

BG&E's reanalysis of the hypothetical loss-of-coolant accident (LOCA) indicate a dose of 118 rem to the thyroid and 10.6 rem to the whole body at the exclusion area boundary (EAB) and 39.3 rem to the thyroid and 2.7 rem to the whole body at the low-population zone (LPZ) boundary. The previously approved doses in the UFSAR, Chapter 14, are a dose of 124 rem to the thyroid and 3.0 rem to the whole body at the EAB and 33 rem to the thyroid and 0.8 rem to the whole body at the LPZ.

The reanalysis results show a slight dose decrease to the thyroid at the EAB and a slight dose increase to the thyroid at the LPZ. The whole-body doses are increased by approximately 3.5 times at the EAB and LPZ. The 10 CFR Part 100 limits are 300 rem to the thyroid and 25 rem to the whole body at both the EAB and LPZ. The increased doses to the whole body are approximately 40 percent at the EAB and 10 percent at the LPZ of the 25 rem limit provided in 10 CFR 100.11.

The results of the reanalysis are roughly similar to the licensing basis evaluation contained in the Commission's Safety Evaluation Report (SER) dated August 28, 1972. The SER results are 110 rem to the thyroid and 4 rem to the whole body at the EAB and 80 rem to the thyroid and 3.0 rem to the whole body, at the LPZ with no containment venting or purging assumed. It should be noted that the dose estimates in the reanalysis represent an extreme upper bound because the release from the containment was assumed to contain fission products derived from a uniform mixing in the containment atmosphere of the iodines and noble gases specified in TID-14844. Even though the percentage increase in offsite doses is not small, the actual total doses are a fraction of the limits of 10 CFR Part 100, as noted above. In evaluating the impact of the increased doses, it is important to view these results in light of the low

probability of the accident. This change does not significantly affect the risk of any dominant accident scenario and the effect on overall risk of accident at this facility is insignificant. With regard to normal environmental releases when venting during power operation with the orifice plates removed, the release limits are controlled by the previously approved TS for each of the Calvert Cliffs units. Therefore, the removal of the orifice plates and reestablishing full flow through the vent lines will result in no additional environmental impact for nonaccident releases.

In summary, the total doses based on the reanalysis are roughly similar to those in the initial licensing basis SER dated August 28, 1972. The doses represent an extreme upper bound, and the doses are a fraction of the 10 CFR Part 100 limits. In addition, as noted above, the removal of the orifice plates would reduce the required time to vent from 28 hours to 4 hours and the probability of an accident occurring during venting decreases with a decreased vent time.

Therefore, based on the above, the NRC staff has concluded that the removal of the orifice plates in each of the Calvert Cliffs Nuclear Power Plant, Units 1 and 2, 4-inch containment vent/purge lines is acceptable. The UFSAR shall be updated to reflect the removal of the orifice plates and the maximum hypothetical accident analysis revised to address the increased flow as the result of the removal of the orifice plates.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact has been prepared and was published in the Federal Register (59 FR 23239) on May 5, 1994. Accordingly, based upon the environmental assessment, the NRC staff has determined that issuance of these amendments will not have a significant effect on the quality of the human environment.

5.0 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: Daniel G. McDonald

Date: October 21, 1994

DATED: October 21, 1994

AMENDMENT NO. 200 TO FACILITY OPERATING LICENSE NO. DPR-53-CALVERT CLIFFS
UNIT 1

AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-69-CALVERT CLIFFS
UNIT 2

Docket File

PUBLIC

PDI-1 Reading

S. Varga, 14/E/4

J. Zwolinski, 14/A/4

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C. Vogan

D. McDonald

OGC

D. Hagan, 3302 MNBB

C. Liang, 8/E/23

G. Hill (4), P1-22

C. Grimes, 11/F/23

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PD plant-specific file

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