

March 6, 1990

Docket No. 50-317

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

Dear Mr. Creel:

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NO. 75562)

The Commission has issued the enclosed Amendment No.140 to Facility Operating License No. DPR-53 for the Calvert Cliffs Power Plant, Unit No. 1. This amendment consists of changes to the Technical Specifications (TS) in response to your application transmitted by letter dated December 20, 1989, as supplemented on January 23, February 2 and 14, 1990.

This amendment modifies the Unit 1 Technical Specifications to ensure adequate low temperature overpressure (LTOP) protection. The changes require the operable high pressure safety injection (HPSI) pump not to receive an automatic start signal when LTOP protection is required, and the unit's safety injection tanks (SITS) to remain operable throughout mode 3, hot standby, operation.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular bi-weekly 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

Enclosures:

1. Amendment No.140 to DPR-53
2. Safety Evaluation

cc: w/enclosures  
 See next page

PDI-1  
 CVogan w  
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 DMcDonald  
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*[Signature]*

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

Calvert Cliffs Nuclear Power Plant

cc:

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

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 140  
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 December 20, 1989, and supplemented on January 23, 1990 and February 2 and 14, 1990, 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, 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 Facility Operating License No. DPR-53 is hereby amended to read as follows:

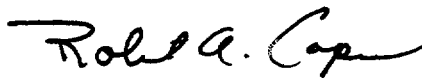
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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 140, 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



Robert A. Capra, Director  
Project Directorate I-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: March 6, 1990

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. FACILITY OPERATING LICENSE NO. DPR-53

DOCKET NO. 50-317

Revise Appendix A as follows:

Remove Pages

3/4 3-11

3/4 5-1

3/4 5-6

Insert Pages

3/4 3-11

3/4 5-1

3/4 5-6

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

| <u>FUNCTIONAL UNIT</u>                      | <u>TOTAL NO. OF CHANNELS</u> | <u>CHANNELS TO TRIP</u> | <u>MINIMUM CHANNELS OPERABLE</u> | <u>APPLICABLE MODES</u> | <u>ACTION</u> |
|---|------------------------------|-------------------------|----------------------------------|-------------------------|---------------|
| 1. SAFETY INJECTION (SIAS) <sup>@</sup>     |                              |                         |                                  |                         |               |
| a. Manual (Trip Buttons)                    | 2                            | 1                       | 2                                | 1, 2, 3, 4              | 6             |
| b. Containment Pressure-High                | 4                            | 2                       | 3                                | 1, 2, 3                 | 7*            |
| c. Pressurizer Pressure - Low               | 4                            | 2                       | 3                                | 1, 2, 3(a)              | 7*            |
| 2. CONTAINMENT SPRAY (CSAS)                 |                              |                         |                                  |                         |               |
| a. Manual (Trip Buttons)                    | 2                            | 1                       | 2                                | 1, 2, 3, 4              | 6             |
| b. Containment Pressure -- High             | 4                            | 2                       | 3                                | 1, 2, 3                 | 11            |
| 3. CONTAINMENT ISOLATION (CIS) <sup>#</sup> |                              |                         |                                  |                         |               |
| a. Manual CIS (Trip Buttons)                | 2                            | 1                       | 2                                | 1, 2, 3, 4              | 6             |
| b. Containment Pressure - High              | 4                            | 2                       | 3                                | 1, 2, 3                 | 7*            |

<sup>#</sup> Containment isolation of non-essential penetrations is also initiated by SIAS (functional units 1.a and 1.c).

<sup>@</sup> When  $T_{avg} \leq 350^{\circ}F$ , the OPERABLE high pressure safety injection pump will be placed in "pull-to-lock" and will not start automatically.

### 3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

#### SAFETY INJECTION TANKS

#### LIMITING CONDITION FOR OPERATION

---

3.5.1 Each reactor coolant system safety injection tank shall be **OPERABLE** with:

- a. The isolation valve open,
- b. A contained borated water volume of between 1113 and 1179 cubic feet of borated water (equivalent to tank levels of between 187 and 199 inches, respectively),
- c. A boron concentration of between 2300 and 2700 ppm, and
- d. A nitrogen cover-pressure of between 200 and 250 psig.

**APPLICABILITY:** MODES 1, 2 and 3.

#### ACTION:

- a. With one safety injection tank inoperable, except as a result of a closed isolation valve, restore the inoperable tank to **OPERABLE** status within one hour or be in **HOT SHUTDOWN** within the next 12 hours.
- b. With one safety injection tank inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in **HOT STANDBY** within one hour and be in **HOT SHUTDOWN** within the next 12 hours.

#### SURVEILLANCE REQUIREMENTS

---

4.5.1 Each safety injection tank shall be demonstrated **OPERABLE**:

- a. At least once per 12 hours by:
  1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks, and
  2. Verifying that each safety injection tank isolation valve is open.

## EMERGENCY CORE COOLING SYSTEMS

ECCS SUBSYSTEMS -  $T_{avg} < 300^{\circ}\text{F}$

### LIMITING CONDITION FOR OPERATION

3.5.3 As a minimum, one ECCS subsystem comprised of the following shall be OPERABLE:

- a. One<sup>#</sup> OPERABLE high-pressure safety injection pump, and
- b. An OPERABLE flow path capable of taking suction from the refueling water tank on a Safety Injection Actuation Signal and automatically transferring suction to the containment sump on a Recirculation Actuation Signal.

APPLICABILITY: MODES 3\* and 4.

#### ACTION:

- a. With no ECCS subsystem OPERABLE, restore at least one ECCS subsystem to OPERABLE status within 1 hour or be in COLD SHUTDOWN within the next 20 hours.
- b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date.

### SURVEILLANCE REQUIREMENTS

4.5.3.1 The ECCS subsystem shall be demonstrated OPERABLE per the applicable Surveillance Requirements of 4.5.2.

4.5.3.2 All high-pressure safety injection pumps, except the above required OPERABLE pump, shall be demonstrated inoperable at least once per 12 hours whenever the temperature of one or more of the RCS cold legs is  $\leq 275^{\circ}\text{F}$  by verifying that the motor circuit breakers have been removed from their electrical power supply circuits.

\*With pressurizer pressure  $< 1750$  psia.

#A maximum of one high-pressure safety injection pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is  $\leq 275^{\circ}\text{F}$ . When  $T_{avg} \leq 350^{\circ}\text{F}$ , the OPERABLE high pressure safety injection pump will be placed in Pull-to-Lock and will not start automatically. Manual use of the high pressure safety injection pump will be conducted in accordance with approved procedures.





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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 140 TO FACILITY OPERATING LICENSE NO. DPR-53  
BALTIMORE GAS AND ELECTRIC COMPANY  
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 1  
DOCKET NO. 50-317

1.0 INTRODUCTION

By letter dated December 20, 1989, the Baltimore Gas and Electric Company (the licensee) proposed to amend the Technical Specifications (TS) of the Calvert Cliffs Nuclear Power Plant, Unit 1. The proposed changes would disable the automatic start feature of the High Pressure Safety Injection (HPSI) pump when in a plant condition requiring Low Temperature Overpressure Protection (LTOP) and require the safety injection tanks to be operable throughout mode 3, hot standby, operation. The licensee, by letters dated January 23, February 2 and 14, 1990, provided supplemental information.

The January 23, 1990, submittal provided the results of the loss of coolant accidents (LOCA) analysis using a different fission product decay heat assumption which did not impact the conclusion reached from the initial analysis. The submittal also provided the consequences of a small break LOCA and the effect of manual startup of the HPSI pump during mode 3. The February 2, 1990, submittal provided further discussion of the consequences of a small break LOCA. Finally, the February 14, 1990, submittal further clarified the impact and controls utilized during manual operation of the HPSI pump. This submittal also requested the footnote added to Technical Specification Table 3.3.3 also be added to Section 3.5.3 with a clarifying statement related to manual operation of the HPSI pump. This clarification assures that the HPSI pump will be operated in a manner such that automatic initiation will not result in an LTOP event.

These supplemental submittals did not affect the proposed TS changes noticed in the Federal Register (55 FR 673) on January 8, 1990 and did not affect the staff's proposed determination that no significant hazards would result from these changes.

The NRC staff has reviewed the application and the supporting documents and has prepared the following evaluation.

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## 2.0 EVALUATION

LTOP is provided by the power operated relief valves (PORVs) on the pressurizer. These PORVs are set at a pressure low enough to prevent violation of the 10 CFR 50 Appendix G pressure/temperature limits during heatup and cooldown should a reactor coolant system (RCS) pressure transient occur during low temperature operations. As presently written, the Calvert Cliffs LTOP system is enabled at RCS temperatures up to 330°F. TS 3.5.3 currently requires that one HPSI pump be available for automatic operation while in mode 3. The licensee has noted that if the HPSI pump were to inadvertently actuate while the LTOP system is enabled, the reactor vessel could be overpressurized beyond the 10 CFR 50, Appendix G, limits. The licensee has proposed a modification to TS Table 3.3-3 and Section 3.5.3 to specify that the required operable HPSI pump will be placed in "pull-to-lock" when the average RCS temperature is less than or equal to 350°F, which will not allow the pump to automatically start. To maintain RCS inventory in the event of a large break loss of coolant accident (LBLOCA) while the HPSI pump is unavailable for automatic start, another specification, TS 3.5.1.b, requires minimum Safety Injection Tanks (SITS) volume to be maintained while in Mode 3 when the pressure is greater than 1750 psia. The licensee has proposed a change which will require the SITS to be operable while in Mode 3 regardless of the pressure.

In support of the proposed changes, the licensee provided the results of a postulated LOCA analysis to determine the SITS pressure and volume needed to fill the reactor vessel following a LBLOCA and the minimum time available to initiate additional RCS makeup flow to maintain core heat removal. In response to a staff concern with one of the analysis assumptions, the licensee provided the results of an evaluation with a revised assumption regarding decay heat. The results of the analysis indicated at least 18 minutes are available for operator action in the event of a LBLOCA. The staff finds the licensee's analysis and results regarding LBLOCA acceptable.

The licensee also has procedures available to the operator for a small break loss of coolant accident (SBLOCA) during mode 3. To quantify the time period for operator action, the licensee provided the results of conservative bounding estimates which demonstrate that there is at least an equivalent margin to LOCA acceptance criteria as that found in the facility Final Safety Analysis Report for the same event. The operator would identify the event through changes in containment conditions, such as; pressure, temperature, and sump level. Upon positive identification of reactor vessel inventory loss by sump level alarms, or containment pressure or temperature alarms which would occur prior to reactor vessel water level reaching the level of the break location, the operator would then manually initiate HPSI injection from the control room, thus minimizing the required operator action time.

The results of the licensee's analyses demonstrated that:

- (1) for a large break LOCA sufficient capacity is available in the SITS to provide core cooling in the absence of HPSI injection for 18 minutes, and
- (2) for a SBLOCA, the time identified for recognition of the existence of the break and manual initiation of a HPSI pump is longer than 18 minutes by a time period dependent upon break size. However, the operator has sufficient time for manual initiation of a HPSI pump following a SBLOCA; thus, the current acceptance criteria for LOCA can be met.

These results show that protection against a postulated LOCA of all break sizes can be maintained based on the proposed changes. Based on these results, the staff finds the response acceptable.

The addition of a footnote to Item 1, Table 3.3-3 of the Technical Specification which states, "When T-avg 350°F, the OPERABLE high pressure safety injection pump will be placed in 'pull-to-lock' and will not start automatically," assures the pump will not automatically start when conditions could result in an LTOP event. The change to Section 3/4.5 requiring the SITS to be operable while in mode 3, regardless of system pressure, assumes that adequate water is available during a postulated LOCA until a HPSI pump is manually started.

The changes are supported by suitably conservative analyses to demonstrate that adequate protection against a postulated LOCA is provided during operational mode 3 when the average RCS temperature is less than or equal to 350°F. Also the proposed changes will not compromise 10 CFR Part 50, Appendix G, limits due to an inadvertent automatic actuation of a HPSI pump. Thus, the staff finds the proposals acceptable.

The request was not clear on manual use of the HPSI pump under required conditions, such, as mitigation of a SBLOCA during mode 3. Such use would be conducted in accordance with an Abnormal Operating Procedure (AOP-2A). To accommodate this need, the licensee, by letter dated February 14, 1990, proposed a clarification to TS 3.5.3, ECCS Subsystems. The clarification includes a footnote to Item a. of Limiting Condition for Operation 3.5.3, page 3/4 5-6, which states, "When T-avg 350°F, the OPERABLE high pressure safety injection pump will be placed in Pull-to-Lock and will not start automatically. Manual use of the high pressure safety injection pump will be conducted in accordance with approved procedures." The approved procedures were previously provided and reviewed by the staff in conjunction with the initial request. This clarification assures the inadvertent automatic initiation will not result in a LTOP event. The staff finds this additional change appropriate and acceptable.

### 3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of the facilities' components located within the restricted areas as defined in 10 CFR 20. The staff has determined that this amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

### 4.0 CONCLUSION

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: March 6, 1990

PRINCIPAL CONTRIBUTIORS:

M. McCoy  
D. McDonald