

DCS MS-016

MAR 16 1984

Docket Nos. 50-317
and 50-318

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Mr. A. E. Lundvall, Jr.
Vice President - Supply
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Dear Mr. Lundvall:

The Commission has issued the enclosed Amendment Nos. 90 and 71 to Facility Operating License Nos. DPR-53 and DPR-69 for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications in response to your application dated September 20, 1983.

The amendments revise the Technical Specifications to revise the Limiting Condition for Operation and Surveillance Requirements for the Control Element Assembly Position Indicator (CEA) Channels. The changes allow expanded use of the "full-in" or "full-out" electrical limit switches to provide indication of CEA position.

A copy of the related Safety Evaluation is enclosed. The notice of issuance will be included in the Commission's next monthly Federal Register notice.

Sincerely,

Original signed by:

David H. Jaffe, Project Manager
Operating Reactors Branch #3
Division of Licensing

Enclosures:

1. Amendment No. 90 to DPR-53
2. Amendment No. 71 to DPR-69
3. Safety Evaluation

cc: See next page

ORB#3/DL
PMKreutzer
2/24/84

ORB#3/DL
DJaffe/pn
2/27/84

ORB#3/DL
JRMiller
2/27/84

OELD
AD:OR:DL
GCLainas
3/7/84 3/16/84
Conditional check verification of monitoring Prior to issuance

Baltimore Gas and Electric Company

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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 NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.90
License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Baltimore Gas & Electric Company (the licensee) dated September 20, 1983, 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.

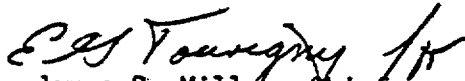
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-53 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 90, 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.

FOR THE NUCLEAR REGULATORY COMMISSION



James R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 16, 1984

ATTACHMENT TO LICENSE AMENDMENT NO. 90

FACILITY OPERATING LICENSE NO. DPR-53

DOCKET NO. 50-317

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are provided to maintain document completeness.

Pages

I-21

I-22

B 3/4 1-4

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.3 At least two of the following three CEA position indicator channels shall be OPERABLE for each shutdown and regulating CEA:

- a. CEA voltage divider reed switch position indicator channel, capable of determining the absolute CEA position within ± 1.75 inches;
- b. CEA "Full Out" or "Full In" reed switch position indicator channel, only if the CEA is fully withdrawn or fully inserted, as verified by actuation of the applicable position indicator; and
- c. CEA pulse counting position indicator channel.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one CEA per group having its voltage divider reed switch position indicator channel or its pulse counting position indicator channel inoperable and the CEA(s) with the inoperable position indicator channel partially inserted, either:
 1. Within 6 hours
 - a) Restore the inoperable position indicator channel to OPERABLE status, or
 - b) Be in at least HOT STANDBY, or
 - c) Reduce THERMAL POWER to $< 70\%$ of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Operation at or below this reduced THERMAL POWER level may continue provided that within the next 4 hours either:
 - 1) The CEA group(s) within the inoperable position indicator is fully withdrawn while maintaining the withdrawal sequence required by Specification 3.1.3.6 and when this CEA group reaches its fully withdrawn position, the "Full Out" limit of the CEA with the inoperable position indicator is actuated and verifies this CEA to be fully withdrawn. Subsequent to fully withdrawing this CEA group(s), the THERMAL POWER level may be returned to a level consistent with all other applicable specifications and operation may continue per Specification 3.1.3.3 above; or
 - 2) The CEA group(s) with the inoperable position indicator is fully inserted, and subsequently maintained fully inserted, while maintaining the withdrawal sequence and THERMAL POWER level required by Specification 3.1.3.6 and when this CEA group reaches its fully

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

inserted position, the "Full In" limit of the CEA with the inoperable indicator is actuated and verifies this CEA to be fully inserted. Subsequent operation shall be within the limits of Specification 3.1.3.6, and may continue per Specification 3.1.3.3 above.

2. or, if the failure existed before entry into MODE 2 or occurs prior to an "all CEAs out" configuration, the CEA group(s) with inoperable position indicator channel must be moved to the "Full Out" position and verified to be fully withdrawn via a "Full Out" indicator. These actions must be completed within 10 hours of entry into MODE 2 and prior to exceeding 70% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination. The provisions of Specification 3.0.4 are not applicable. Once these actions are completed, operation may continue per Specification 3.1.3.3 above.
- b. With more than one CEA per group having its CEA pulse counting position indicator channel and either (1) the "Full Out" or "Full In" position indicator, or (2) the voltage divider position indicator channel inoperable, operation in MODES 1 and 2 may continue for up to 24 hours provided that for the affected CEAs, either:
 1. The CEA voltage divider reed switch position indicator channels are OPERABLE, or
 2. The CEA "Full Out" or "Full In" reed switch position indicator channels are OPERABLE, with the CEA fully withdrawn or fully inserted as verified by actuation of the applicable position indicator.

SURVEILLANCE REQUIREMENTS

4.1.3.3.1 Each required CEA position indication channel shall be determined to be OPERABLE by determining CEA positions as follows at least once per 12 hours, by:

- a. Verifying the CEA pulse counting position indicator channels and the CEA voltage divider reed switch position indicator channels agree within 4.5 inches, or
- b. Verifying the CEA pulse counting position indicator channels and the CEA "Full Out" or "Full In" reed switch position indicator channels agree within 4.5 inches, or
- c. Verifying the CEA voltage divider reed switch position indicator channels and the CEA "Full Out" or "Full In" reed switch position indicator channels agree within 4.5 inches.

4.1.3.3.2 During time intervals when the deviation circuit is inoperable, the above verification of required CEA position indicator channels shall be made at least once per 4 hours.

REACTIVITY CONTROL SYSTEMS

BASES

The boron capability required below 200°F is based upon providing a 3% $\Delta k/k$ SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires either 737 gallons of 7.25% boric acid solution from the boric acid tanks or 9,844 gallons of 2300 ppm borated water from the refueling water tank.

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met.

The ACTION statements applicable to a stuck or untrippable CEA and to a large misalignment (≥ 15 inches) of two or more CEAs, require a prompt shutdown of the reactor since either of these conditions may be indicative of a possible loss of mechanical functional capability of the CEAs and in the event of a stuck or untrippable CEA, the loss of SHUTDOWN MARGIN.

For small misalignments (< 15 inches) of the CEAs, there is 1) a small degradation in the peaking factors relative to those assumed in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 2) a small effect on the time dependent long term power distributions relative to those used in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 3) a small effect on the available SHUTDOWN MARGIN, and 4) a small effect on the ejected CEA worth used in the safety analysis. Therefore, the ACTION statement associated with the small misalignment of a CEA permits a one hour time interval during which attempts may be made to restore the CEA to within its alignment requirements prior to initiating a reduction in THERMAL POWER. The one hour time limit is sufficient to (1) identify causes of a misaligned CEA, (2) take appropriate corrective action to realign the CEAs and (3) minimize the effects of xenon redistribution.

REACTIVITY CONTROL SYSTEMS

BASES

Overpower margin is provided to protect the core in the event of a large misalignment (≥ 15 inches) of a CEA. However, this misalignment would cause distortion of the core power distribution. The reactor protective system would not detect the degradation in radial peaking factors and since variations in other system parameters (e.g., pressure and coolant temperature) may not be sufficient to cause trips, it is probable that the reactor could be operating with process variables less conservative than those assumed in generating LCO and LSSS setpoints. Therefore, the ACTION statement associated with the large misalignment of a CEA requires a prompt and significant reduction in THERMAL POWER prior to attempting realignment of the misaligned CEA.

The ACTION statements applicable to misaligned or inoperable CEAs include requirements to align the OPERABLE CEAs in a given group with the inoperable CEA. Conformance with these alignment requirements bring the core, within a short period of time, to a configuration consistent with that assumed in generating LCO and LSSS setpoints. However, extended operation with CEAs significantly inserted in the core may lead to perturbations in 1) local burnup, 2) peaking factors, and 3) available shutdown margin which are more adverse than the conditions assumed to exist in the safety analyses and LCO and LSSS setpoints determination. Therefore, time limits have been imposed on operation with inoperable CEAs to preclude such adverse conditions from developing.

Operability of the CEA position indicators is required to determine CEA positions and thereby ensure compliance with the CEA alignment and insertion limits and ensures proper operation of the rod block circuit. The CEA "Full In" and "Full Out" limits provide an additional independent means for determining the CEA positions when the CEAs are at either their fully inserted or fully withdrawn positions. Therefore, the OPERABILITY and the ACTION statements applicable to inoperable CEA position indicators permit continued operations when positions of CEAs with inoperable position indicators can be verified by the "Full In" or "Full Out" limits.

CEA positions and OPERABILITY of the CEA position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

The surveillance requirements affecting CEAs with inoperable position indication channels allow 10 minutes for testing each affected CEA. This time limit was selected so that 1) the time would be long enough for the required testing, and 2) if all position indication were lost during testing, the time would be short enough to allow a power reduction to 70% of maximum allowable thermal power within one hour from when the testing was initiated. The time limit ensures CEA misalignments occurring during CEA testing are corrected within the time requirements required by existing specifications.



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

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 71
License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Baltimore Gas & Electric Company (the licensee) dated September 20, 1983, 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.

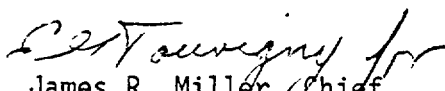
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.2 of Facility Operating License No. DPR-69 is hereby amended to read as follows:

2. Technical Specifications

- The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 71, 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.

FOR THE NUCLEAR REGULATORY COMMISSION


James R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 16, 1984

ATTACHMENT TO LICENSE AMENDMENT NO. 71

FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NO. 50-318

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are provided to maintain document completeness.

Pages

1-21

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B 3/4 1-4

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.3 At least two of the following three CEA position indicator channels shall be OPERABLE for each shutdown and regulating CEA:

- a. CEA voltage divider reed switch position indicator channel, capable of determining the absolute CEA position within ± 1.75 inches;
- b. CEA "Full Out" or "Full In" reed switch position indicator channel, only if the CEA is fully withdrawn or fully inserted, as verified by actuation of the applicable position indicator; and
- c. CEA pulse counting position indicator channel.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one CEA per group having its voltage divider reed switch position indicator channel or its pulse counting position indicator channel inoperable and the CEA(s) with the inoperable position indicator channel partially inserted, either:
 1. Within 6 hours
 - a) Restore the inoperable position indicator channel to OPERABLE status, or
 - b) Be in at least HOT STANDBY, or
 - c) Reduce THERMAL POWER to $< 70\%$ of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Operation at or below this reduced THERMAL POWER level may continue provided that within the next 4 hours either:
 - 1) The CEA group(s) within the inoperable position indicator is fully withdrawn while maintaining the withdrawal sequence required by Specification 3.1.3.6 and when this CEA group reaches its fully withdrawn position, the "Full Out" limit of the CEA with the inoperable position indicator is actuated and verifies this CEA to be fully withdrawn. Subsequent to fully withdrawing this CEA group(s), the THERMAL POWER level may be returned to a level consistent with all other applicable specifications and operation may continue per Specification 3.1.3.3 above; or
 - 2) The CEA group(s) with the inoperable position indicator is fully inserted, and subsequently maintained fully inserted, while maintaining the withdrawal sequence and THERMAL POWER level required by Specification 3.1.3.6 and when this CEA group reaches its fully

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

inserted position, the "Full In" limit of the CEA with the inoperable indicator is actuated and verifies this CEA to be fully inserted. Subsequent operation shall be within the limits of Specification 3.1.3.6, and may continue per Specification 3.1.3.3 above.

2. or, if the failure existed before entry into MODE 2 or occurs prior to an "all CEAs out" configuration, the CEA group(s) with inoperable position indicator channel must be moved to the "Full Out" position and verified to be fully withdrawn via a "Full Out" indicator. These actions must be completed within 10 hours of entry into MODE 2 and prior to exceeding 70% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination. The provisions of Specification 3.0.4 are not applicable. Once these actions are completed, operation may continue per Specification 3.1.3.3 above.
- b. With more than one CEA per group having its CEA pulse counting position indicator channel and either (1) the "Full Out" or "Full In" position indicator, or (2) the voltage divider position indicator channel inoperable, operation in MODES 1 and 2 may continue for up to 24 hours provided that for the affected CEAs, either:
 1. The CEA voltage divider reed switch position indicator channels are OPERABLE, or
 2. The CEA "Full Out" or "Full In" reed switch position indicator channels are OPERABLE, with the CEA fully withdrawn or fully inserted as verified by actuation of the applicable position indicator.

SURVEILLANCE REQUIREMENTS

4.1.3.3.1 Each required CEA position indication channel shall be determined to be OPERABLE by determining CEA positions as follows at least once per 12 hours, by:

- a. Verifying the CEA pulse counting position indicator channels and the CEA voltage divider reed switch position indicator channels agree within 4.5 inches, or
- b. Verifying the CEA pulse counting position indicator channels and the CEA "Full Out" or Full In" reed switch position indicator channels agree within 4.5 inches, or
- c. Verifying the CEA voltage divider reed switch position indicator channels and the CEA "Full Out" or "Full In" reed switch position indicator channels agree within 4.5 inches.

4.1.3.3.2 During time intervals when the deviation circuit is inoperable, the above verification of required CEA position indicator channels shall be made at least once per 4 hours.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 90 AND 71

TO FACILITY OPERATING LICENSE NOS. DPR-53 AND DPR-69

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

Introduction

By application dated September 20, 1983, the Baltimore Gas and Electric Company (BG&E) requested changes to the Technical Specifications (TS) for Calvert Cliffs Units 1 and 2. The proposed changes to the TS would revise Limiting Conditions for Operation and Surveillance Requirements for the Control Element Assembly (CEA) Position Indicator channels. These changes would allow expanded use of the "full-in" or "full-out" electrical limit switches to provide indication of CEA position.

Discussion and Evaluation

The Limiting Conditions for Operation and Surveillance Requirements for the Control Element Assembly (CEA) Position Indicator Channels are addressed in Calvert Cliffs Units 1 and 2 Technical Specification (TS) 3/4.1.3.3, "Position Indicator Channels." At the present time, TS 3/4.1.3.3 allows partial "credit" for full-in or full-out CEA position indication in that, with one CEA position indicating channel per CEA group inoperable, reactor operation may continue provided that the affected CEA position is verified via the full-in or full-out electrical limit reed switches. The proposed TS changes would allow expanded credit for these electrical limit reed switches by (1) reorganizing TS 3.1.3.3 to incorporate the full-in and full-out reed switch position indicating channels as one of three CEA position indicating means, (2) allow any CEA to have two of three operable CEA position indicating means, and (3) provide surveillance requirements in TS 4.1.3.3 for the two CEA position indicating means which are being utilized.

As indicated previously, three means of CEA position indication are provided. Each control rod drive mechanism at Calvert Cliffs Units 1 and 2 is provided with a reed switch system which provides positive indication of control rod insertion status. The reed switch CEA position indication system utilizes a series of magnetically actuated reed switches, spaced at 2-inch intervals along the CEA housing and arranged with precision resistors in a voltage divider network, to provide voltage signals proportional to CEA position. These signals are displayed in bar chart form by a cathode ray tube (CRT) on the main control board. A logic package associated with the CRT provides

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P PDR

redundant alarm functions. A backup readout is provided which can be utilized to read the output of any reed switch voltage divider. The collection of position indicating reed switches for CEA is referred to as a reed switch position indicating channel. In addition to the position indicating reed switches placed at 2-inch intervals, additional reed switches are located at the "full-out and "full-in" CEA positions. These reed switches provide verification of full-out/full-in status on a core mimic which is located on the main control panel. The third means of CEA position indication, referred to as "pulse counting", displays a numerical readout of the requested CEA position. At the present time, TS 3.1.3.3 allows "credit" for the full-out or full-in reed switches. Upon failure of up to one position indicating reed switch channel per CEA group, TS 3.1.3.3 allows power operation to continue provided that the positions of the associated CEAs are periodically verified via the full-out or full-in reed switches. The Basis for TS 3.1.3.3 states, in part, "The CEA "Full-In" and "Full-Out" limits provide an additional independent means for determining the CEA positions when the CEAs are at either their fully inserted or fully withdrawn positions. Therefore, the ACTION statements applicable to inoperable CEA position indicators permit continued operations when the positions of CEAs with inoperable position indicators can be verified by the "Full-In" or "Full-Out" limits."

The effect of the proposed TS change is to allow the position of any CEA, with an inoperable CEA position indicating channel, to be verified by the two remaining operable position indicating means. The existing Bases for TS 3/4.1.3.3 recognize all three CEA position indicating means, pulse counting, reed switch stacks, and full-in/full-out electrical limits, to be acceptable means for CEA position indication. The present restriction on use of the full-in/full-out electrical limits to a single CEA per CEA group is unnecessary in that each CEA position is determined individually. Thus, the distinction with regard to CEA group is unnecessary in that each CEA, regardless of group assignment, is required to have at least two independent means of CEA position indication. Since each control rod is provided with redundant means of position indication, the margin of safety with regard to indication of accidentally misaligned control rods has not been reduced. In addition, Chapter 14 of the Calvert Cliffs FSAR considers a number of accidents that result from misaligned CEAs. Since a high degree of certainty exists with regard to CEA position, neither the probability nor consequences of these accidents will increase. In addition since no changes will be made to plant equipment design or operating conditions no new or different types of accidents will occur. Accordingly, the NRC concludes that the proposed changes to Calvert Cliffs TS 3/4.1.3.3 are acceptable.

Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to

10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of the amendments.

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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: March 16, 1984.

Principal Contributors:

D. Jaffe

H. Li

REACTIVITY CONTROL SYSTEMS

BASES

The boron capability required below 200°F is based upon providing a 3% $\Delta k/k$ SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires either 737 gallons of 7.25% boric acid solution from the boric acid tanks or 9,844 gallons of 2300 ppm borated water from the refueling water tank.

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met.

The ACTION statements applicable to a stuck or untrippable CEA and to a large misalignment (> 15 inches) of two or more CEAs, require a prompt shutdown of the reactor since either of these conditions may be indicative of a possible loss of mechanical functional capability of the CEAs and in the event of a stuck or untrippable CEA, the loss of SHUTDOWN MARGIN.

For small misalignments (≤ 15 inches) of the CEAs, there is 1) a small degradation in the peaking factors relative to those assumed in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 2) a small effect on the time dependent long term power distributions relative to those used in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 3) a small effect on the available SHUTDOWN MARGIN, and 4) a small effect on the ejected CEA worth used in the safety analysis. Therefore, the ACTION statement associated with the small misalignment of a CEA permits a one hour time interval during which attempts may be made to restore the CEA to within its alignment requirements prior to initiating a reduction in THERMAL POWER. The one hour time limit is sufficient to (1) identify causes of a misaligned CEA, (2) take appropriate corrective action to realign the CEAs and (3) minimize the effects of xenon redistribution.

Overpower margin is provided to protect the core in the event of a large misalignment (> 15 inches) of a CEA. However, this misalignment would cause distortion of the core power distribution. The reactor

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protective system would not detect the degradation in radial peaking factors and since variations in other system parameters (e.g., pressure and coolant temperature) may not be sufficient to cause trips, it is probable that the reactor could be operating with process variables less conservative than those assumed in generating LCO and LSSS setpoints. Therefore, the ACTION statement associated with the large misalignment of a CEA requires a prompt and significant reduction in THERMAL POWER prior to attempting realignment of the misaligned CEA.

The ACTION statements applicable to misaligned or inoperable CEAs include requirements to align the OPERABLE CEAs in a given group with the inoperable CEA. Conformance with these alignment requirements brings the core, within a short period of time, to a configuration consistent with that assumed in generating LCO and LSSS setpoints. However, extended operation with CEAs significantly inserted in the core may lead to perturbations in 1) local burnup, 2) peaking factors and 3) available shutdown margin which are more adverse than the conditions assumed to exist in the safety analyses and LCO and LSSS setpoints determination. Therefore, time limits have been imposed on operation with inoperable CEAs to preclude such adverse conditions from developing.

Operability of the CEA position indicators is required to determine CEA positions and thereby ensure compliance with the CEA alignment and insertion limits and ensures proper operation of the rod block circuit. The CEA "Full In" and "Full Out" limits provide an additional independent means for determining the CEA positions when the CEAs are at either their fully inserted or fully withdrawn positions. Therefore, the OPERABILITY and the ACTION statements applicable to inoperable CEA position indicators permit continued operations when the positions of CEAs with inoperable position indicators can be verified by the "Full In" or "Full Out" limits.

CEA positions and OPERABILITY of the CEA position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

The surveillance requirements affecting CEAs with inoperable position indication channels allow 10 minutes for testing each affected CEA. This time limit was selected so that 1) the time would be long enough for the required testing, and 2) if all position indication were lost during testing, the time would be short enough to allow a power reduction to 70% of maximum allowable thermal power within one hour from when the testing was initiated. The time limit ensures CEA misalignments occurring during CEA testing are corrected within the time requirements required by existing specifications.

The maximum CEA drop time restriction is consistent with the assumed CEA drop time used in the accident analyses. Measurements with $T_{avg} \geq 515^\circ$ and with all reactor coolant pumps operating ensures that the



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 90 AND 71

TO FACILITY OPERATING LICENSE NOS. DPR-53 AND DPR-69

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

Introduction

By application dated September 20, 1983, the Baltimore Gas and Electric Company (BG&E) requested changes to the Technical Specifications (TS) for Calvert Cliffs Units 1 and 2. The proposed changes to the TS would revise Limiting Conditions for Operation and Surveillance Requirements for the Control Element Assembly (CEA) Position Indicator channels. These changes would allow expanded use of the "full-in" or "full-out" electrical limit switches to provide indication of CEA position.

Discussion and Evaluation

The Limiting Conditions for Operation and Surveillance Requirements for the Control Element Assembly (CEA) Position Indicator Channels are addressed in Calvert Cliffs Units 1 and 2 Technical Specification (TS) 3/4.1.3.3, "Position Indicator Channels." At the present time, TS 3/4.1.3.3 allows partial "credit" for full-in or full-out CEA position indication in that, with one CEA position indicating channel per CEA group inoperable, reactor operation may continue provided that the affected CEA position is verified via the full-in or full-out electrical limit reed switches. The proposed TS changes would allow expanded credit for these electrical limit reed switches by (1) reorganizing TS 3.1.3.3 to incorporate the full-in and full-out reed switch position indicating channels as one of three CEA position indicating means, (2) allow any CEA to have two of three operable CEA position indicating means, and (3) provide surveillance requirements in TS 4.1.3.3 for the two CEA position indicating means which are being utilized.

As indicated previously, three means of CEA position indication are provided. Each control rod drive mechanism at Calvert Cliffs Units 1 and 2 is provided with a reed switch system which provides positive indication of control rod insertion status. The reed switch CEA position indication system utilizes a series of magnetically actuated reed switches, spaced at 2-inch intervals along the CEA housing and arranged with precision resistors in a voltage divider network, to provide voltage signals proportional to CEA position. These signals are displayed in bar chart form by a cathode ray tube (CRT) on the main control board. A logic package associated with the CRT provides

redundant alarm functions. A backup readout is provided which can be utilized to read the output of any reed switch voltage divider. The collection of position indicating reed switches for CEA is referred to as a reed switch position indicating channel. In addition to the position indicating reed switches placed at 2-inch intervals, additional reed switches are located at the "full-out and "full-in" CEA positions. These reed switches provide verification of full-out/full-in status on a core mimic which is located on the main control panel. The third means of CEA position indication, referred to as "pulse counting", displays a numerical readout of the requested CEA position. At the present time, TS 3.1.3.3 allows "credit" for the full-out or full-in reed switches. Upon failure of up to one position indicating reed switch channel per CEA group, TS 3.1.3.3 allows power operation to continue provided that the positions of the associated CEAs are periodically verified via the full-out or full-in reed switches. The Basis for TS 3.1.3.3 states, in part, "The CEA "Full-In" and "Full-Out" limits provide an additional independent means for determining the CEA positions when the CEAs are at either their fully inserted or fully withdrawn positions. Therefore, the ACTION statements applicable to inoperable CEA position indicators permit continued operations when the positions of CEAs with inoperable position indicators can be verified by the "Full-In" or "Full-Out" limits."

The effect of the proposed TS change is to allow the position of any CEA, with an inoperable CEA position indicating channel, to be verified by the two remaining operable position indicating means. The existing Bases for TS 3/4.1.3.3 recognize all three CEA position indicating means, pulse counting, reed switch stacks, and full-in/full-out electrical limits, to be acceptable means for CEA position indication. The present restriction on use of the full-in/full-out electrical limits to a single CEA per CEA group is unnecessary in that each CEA position is determined individually. Thus, the distinction with regard to CEA group is unnecessary in that each CEA, regardless of group assignment, is required to have at least two independent means of CEA position indication. Since each control rod is provided with redundant means of position indication, the margin of safety with regard to indication of accidentally misaligned control rods has not been reduced. In addition, Chapter 14 of the Calvert Cliffs FSAR considers a number of accidents that result from misaligned CEAs. Since a high degree of certainty exists with regard to CEA position, neither the probability nor consequences of these accidents will increase. In addition since no changes will be made to plant equipment design or operating conditions no new or different types of accidents will occur. Accordingly, the NRC concludes that the proposed changes to Calvert Cliffs TS 3/4.1.3.3 are acceptable.

Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to

10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of the amendments.

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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: March 16, 1984.

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