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May 27, 1994

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
License Amendment Request; Extension of the Reactor Protection System and
Engineered Safety Feature Actuation System Surveillances from Monthly to
Quarterly

Pursuant to 10 CFR 50.90, the Baltimore Gas and Electric Company hereby requests an Amendment to Operating License Nos. DPR-53 and DPR-69 by incorporating the changes described below into the Technical Specifications for Calvert Cliffs Unit Nos. 1 and 2.

DESCRIPTION

The proposed amendment would revise the Technical Specification surveillance test interval from monthly to quarterly for several channel functional tests for the Reactor Protective System (RPS) and the Engineered Safety Feature Actuation System (ESFAS). This proposed change is based on the analysis documented in CEN-327 (Reference a) and CEN-327, Supplement 1 (Reference b). The NRC approved these reports in Reference (c). In addition, an administrative change to the ESFAS table is proposed which removes an out-of-date footnote concerning the Emergency Diesel Generator (EDG) logic circuit modifications.

BACKGROUND

The RPS and ESFAS provide actuation signals to the safety equipment needed to mitigate design basis accidents and transients. Periodic testing is performed to demonstrate the functionality of the system. Frequent testing of these systems increases the possibility of test-induced system actuations and plant trips. Increasing the surveillance test interval minimizes the potential for inadvertent RPS/ESFAS actuations and trips during surveillance testing.

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In Generic Letter 83-28 (Reference d), the NRC requested plants to review the RPS test intervals to determine if they were consistent with achieving high RPS availability. Combustion Engineering (CE) performed a sensitivity analysis to evaluate the availability of the RPS given the 30-day test interval required by the Technical Specifications. Later, as a follow-up to the original sensitivity analysis, the impact of extending the surveillance test intervals for selected components in the RPS and ESFAS was evaluated by CE. This analysis is documented in CEN-327 "RPS/ESFAS Extended Test Interval Evaluation."

In CEN-327, four RPS fault tree models developed previously for the Combustion Engineering Owner's Group (CEOG) were expanded to cover all RPS electronic trip parameters. The new models, which included the Calvert Cliffs RPS design, were then used to determine the RPS reliability for both monthly and quarterly test intervals. The model considered common mode failures, operator errors, reduced redundancy, and random component failures. The study results show that for the Calvert Cliffs RPS, adoption of a quarterly test interval yields a decrease in core melt frequency attributable to reduced exposure to test-induced transients. This decrease in core melt frequency was shown to be offset by an increase in system unavailability. The overall safety impact of the reduced testing was judged to be negligible.

Fault tree models were also constructed for each of the ESFAS signals for the different plant classes used for the RPS analysis. Each ESFAS fault tree model specifically addressed common mode failures, operator error, reduced redundancy, and random component failures. The study found that for Calvert Cliffs, adoption of a quarterly test interval would yield a decrease in core melt frequency due to the reduced exposure to test-induced transients, and a small increase in core melt frequency due to the increase in system unavailability. For the Calvert Cliffs ESFAS, the net safety impact of extending the test interval to quarterly was shown to be negligible.

In March 1989, CE issued CEN-327, Supplement 1, which presented changes in RPS reliability that resulted from extending the test intervals from 30 days to 90 days for all RPS trip parameters, and recommended a 90-day test interval with sequential testing. CEN-327, Supplement 1, re-evaluated 19 RPS trip parameters which in CEN-327 had resulted in a slight increase in overall core melt frequency. The results of the re-analysis demonstrated that the surveillance test interval could be increased to 90 days with no significant increase in RPS unavailability.

The analysis results presented in CEN-327 and CEN-327, Supplement 1, demonstrated that the surveillance test interval for RPS and ESFAS components can be increased with a negligible change in the core melt frequency. For the 90-day test interval, the overall impact of the reduced testing on safety is considered to be negligible. Extending the surveillance test interval does not change the trip-per-test frequency, but does reduce the trip-per-year frequency.

In November 1989, the NRC issued a Safety Evaluation Report (SER) for CEN-327 and CEN-327, Supplement 1. The NRC stated that it was acceptable to extend the surveillance test intervals for the RPS and ESFAS from 30 days to 90 days for all CE plants (excluding Maine Yankee). This approval was contingent on each plant confirming that instrument drift occurring over the proposed surveillance test interval would not cause the setpoint values to exceed those assumed in the safety analysis and specified in the Technical Specifications. The NRC SER stated that licensees must confirm that they have reviewed instrument drift information for each channel involved, and have determined that drift occurring in that

channel over the period of extended surveillance test interval would not cause the setpoint value to exceed the allowable value as calculated for that channel by the licensee's methodology; each licensee should have onsite records of the as-found and as-left values showing actual calculations and supporting data for planned future NRC audits; the records should consist of monthly data over a period of the last two to three years with the current plant-specific setpoint methodology used to derive the safety margins. The plant-specific evaluation for Calvert Cliffs concluded that instrument drift for the extended surveillance test interval do not exceed the current 30-day setpoint assumptions. Three years of observed, monthly, as-found and as-left data for each channel of the applicable instrumentation functions were reviewed for the plant-specific evaluation. The onsite records of the as-found and as-left values showing the calculations and supporting data are available for future NRC audits.

In addition to the proposed changes in surveillance interval, a change is proposed which will remove an out-of-date footnote. Amendments 164/144 (Reference e), added a footnote to the ESFAS Table 4.3-2 that exempted the monthly tests for SIAS logic circuits A-10 and B-10 until the EDG logic circuit modifications were completed. These modifications have been completed and this footnote is no longer needed. Table 4.3-2 is changed in this proposed amendment and, therefore, we propose deleting this footnote.

REQUESTED CHANGE

Change Specifications Table 4.3-1 and Table 4.3-2 of the Unit 1 and Unit 2 Technical Specifications and associated Bases as shown on the marked-up pages attached to this transmittal. The final Technical Specification pages will be renumbered to accommodate added and/or deleted pages.

SAFETY ANALYSIS

The RPS and ESFAS provide actuation signals to the safety equipment needed to mitigate accidents and transients. The NRC has found it acceptable to extend the surveillance test intervals for the RPS and ESFAS based on CEN-327 and CEN-327, Supplement 1. For RPS and ESFAS instrumentation channels affected, CEN-327 and its associated supplement documented that extending the surveillance test intervals resulted in a decrease in core melt frequency due to the reduced exposure to test-induced transients and an increase in core melt frequency due to the increase in system unavailability. The net impact of extending the test interval from monthly to quarterly is a negligible change in core melt frequency. A plant-specific instrument drift analysis was conducted that analyzed the effect on instrument drift of extending the RPS and ESFAS instrumentation functional surveillance test interval from monthly to quarterly. The plant-specific analysis is consistent with ISA-RP67.04 Part II (Reference f) and the Electric Power Research institute guidelines (Reference g). A 120-day drift interval was calculated to bound the quarterly interval plus the 25% maximum allowable extension period permitted in the Calvert Cliffs Technical Specifications. A review of all of the affected RPS and ESFAS instrumentation channels determined that the instrument drift for the extended surveillance test interval do not exceed the current 30-day setpoint assumptions. Therefore, it is unnecessary to change any setpoints to accommodate the proposed extended surveillance test intervals.

The proposed removal of the footnote from the ESFAS Table 4.3-2 is an administrative change. The modifications referenced in the footnote have been completed and this proposed change only removes obsolete information from the Technical Specifications.

DETERMINATION OF SIGNIFICANT HAZARDS

The proposed change has been evaluated against the standards in 10 CFR 50.92 and has been determined to not involve a significant hazards consideration, in that operation of the facility in accordance with the proposed amendments:

1. *Would not involve a significant increase in the probability or consequences of an accident previously evaluated.*

The Reactor Protective System (RPS) and the Engineered Safety Features Actuation System (ESFAS) provide the actuation signals to safety equipment necessary to mitigate design basis accidents and transients. The proposed change would increase the surveillance test interval from monthly to quarterly for several of the RPS and ESFAS instrumentation channel functional tests. The RPS/ESFAS instruments are not an initiator in any previously evaluated accidents. Therefore, the proposed change does not involve an increase in the probability of an accident previously evaluated. The required plant-specific setpoint drift analysis for Calvert Cliffs demonstrated that the observed changes in instrument uncertainties for the extended surveillance test interval do not exceed the current 30-day setpoint assumptions. This provides confidence the 90-day test interval will not impact the ability to detect and monitor system degradation. Therefore, the proposed change will not change the ability of the RPS/ESFAS instrumentation to respond to and mitigate the consequences of any previously evaluated accident. In addition, an obsolete footnote is removed from ESFAS Table 4.3-2.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Would not create the possibility of a new or different type of accident from any accident previously evaluated.*

The proposed extended surveillance test interval for the RPS and ESFAS and the removal of the obsolete footnote does not involve any changes in equipment or the function of these instruments. The proposed change does not represent a change in the configuration or operation of the plant. The RPS and ESFAS setpoints will not be changed as the instrument uncertainties resulting from the proposed surveillance test interval (calculated using actual plant data) are less than the instrument uncertainties assumed for the current surveillance interval. Therefore, the proposed change does not create the possibility of a new or different type of accident from any accident previously evaluated.

3. *Would not involve a significant reduction in a margin of safety.*

The proposed change will not affect the functions of the RPS or the ESFAS instruments. The CEN-327 and CEN-327, Supplement 1, topical reports quantified the corresponding changes in core melt frequency for the representative fault tree models that were developed for Calvert Cliffs. The proposed change has two principal effects with opposing impacts on core melt frequency. The first impact is a slight increase in core melt frequency that results from the increased unavailability of the instrumentation in question. This assumed unavailability results from less frequent testing. The unavailability of the tested instrumentation components represents the potential for the failure of the reactor to trip, an Anticipated Transient Without Scram, or a failure of the appropriate engineered safety features to actuate when required. The opposing impact on core melt risk is the corresponding reduction in core melt frequency that would result due to the reduced exposure of the plant to test-induced transients. The two changes are nearly equal and the net result is no distinguishable effect on plant safety. The NRC issued a Safety Evaluation Report which found that these evaluations were acceptable for justifying the extensions in the surveillance test intervals for the RPS and ESFAS from 30 days to 90 days.

The RPS and ESFAS setpoints will not be changed since the instrument drift resulting from the proposed surveillance test interval is less than the instrument drift presently assumed for the current surveillance interval. This provides confidence the 90-day test interval will not impact the ability to detect and monitor system degradation. The removal of the ESFAS Table footnote only removes obsolete information from the Technical Specifications. The conclusions of the accident analyses in the Calvert Cliffs Updated Safety Analysis Report remain valid and the safety limits continue to be met. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

ENVIRONMENTAL ASSESSMENT

The proposed amendment would change requirements with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes to an inspection or surveillance requirement. We have determined that the proposed amendment involves no significant hazards consideration, and that operation with the proposed amendment would result in no significant change in the types or significant increases in the amounts of any effluents that may be released offsite, and in no significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment is eligible for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is needed in connection with the approval of the proposed amendment.

SCHEDULE

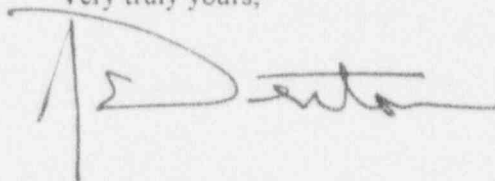
This change is requested to be approved and issued by December 1, 1994. However, issuance of this amendment is not currently identified as impacting outage completion or continued plant operation.

SAFETY COMMITTEE REVIEW

These proposed changes to the Technical Specifications and our determination of significant hazards have been reviewed by our Plant Operations and Safety Review Committee and Offsite Safety Review Committee. They have concluded that implementing these changes will not result in an undue risk to the health and safety of the public.

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

Very truly yours,



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

I hereby certify that on the 27th day of May, 1994, before me, the subscriber, a Notary Public of the State of Maryland in and for Calvert County, personally appeared Robert E. Denton, being duly sworn, and states that he is Vice President of the Baltimore Gas and Electric Company, a corporation of the State of Maryland; that he provides the foregoing response for the purposes therein set forth; that the statements made are true and correct to the best of his knowledge, information, and belief, and that he was authorized to provide the response on behalf of said Corporation.

WITNESS my Hand and Notarial Seal:



Michelle D. Hall
Notary Public

My Commission Expires:

February 2, 1998
Date

RED/DJM/dlm

- Attachments: (1) Unit 1 Technical Specifications Revised Pages
(2) Unit 2 Technical Specifications Revised Pages

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
R. A. Capra, NRC
D. G. McDonald, Jr., NRC
T. T. Martin, NRC
P. R. Wilson, NRC
R. I. McLean, DNR
J. H. Walter, PSC

- REFERENCES:
- (a) CEN-327, "RPS/ESFAS Extended Test Interval Evaluation," dated May 1986
 - (b) CEN-327, Supplement 1, "RPS/ESFAS Extended Test Interval Evaluation," dated January 1989
 - (c) Letter from Mr. A. C. Thadani (NRC) to Mr. E. Sterling (APSC), dated November 6, 1989, NRC Evaluation of CEOG Topical Report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation"
 - (d) Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events," dated July 8, 1983
 - (e) Letter from Mr. D. G. McDonald, Jr. (NRC) to Mr. G. C. Creel (BGE), dated October 31, 1991, Issuance of Amendments for Calvert Cliffs Nuclear Power Plant, Unit No. 1 (TAC No. 81360) and Unit No. 2 (TAC No. 81361)
 - (f) ISA-RP 67.04 Part II, Draft 10, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation," August 1992
 - (g) EPRI TR-103335, "Guidelines for Instrument Calibration Extension/Reduction Programs," March 1994

ATTACHMENT (1)

UNIT 1
TECHNICAL SPECIFICATION
REVISED PAGES

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