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VICE PRESIDENT  
SUPPLY

October 12, 1984

Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D. C. 20555

ATTENTION: Mr. James R. Miller, Chief  
Operating Reactors Branch #3

SUBJECT: Calvert Cliffs Nuclear Power Plant  
Unit Nos. 1 & 2, Docket Nos. 50-317 & 50-318  
Request for Amendment

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Gentlemen:

The Baltimore Gas and Electric Company hereby requests an Amendment to its Operating License Nos. DPR-53 and DPR-69 for Calvert Cliffs Unit Nos. 1 and 2, respectively, with the submittal of the following proposed changes to the Technical Specifications.

#### PROPOSED CHANGES

Replace the following old pages on the left with the new marked-up pages. Pages and numbers are identical for both Unit 1 and 2 Technical Specifications.

page 3/4 8-1	page 3/4 8-1	Attachment 1
page 3/4 8-2	page 3/4 8-2	Attachment 1
page 3/4 8-2a	page 3/4 8-2a	Attachment 1
page 3/4 8-3	page 3/4 8-3	Attachment 1
page 3/4 8-4	page 3/4 8-4	Attachment 1

#### DISCUSSION

For brevity, we have listed each action statement and detailed each proposed change under the heading of "Discussion". Justification for each change to the action statements follows under the heading "Justification".

#### Action Statement 3.8.1.1.a

This action statement currently specifies the required actions for the inoperability of one 500 KV offsite circuit or diesel generator. In proposing changes to Action Statement 3.8.1.1.a, we have incorporated the format provided in Generic Letter 84-15 in that the diesel generator power source will be addressed in the new Action Statement 3.8.1.1.b.

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Additionally we have eliminated the reference to "one 500 KV" offsite circuit, and replaced with "two" offsite circuits. The phrase, "... of the above required A.C. electrical power sources. . ." has been deleted. Action Statement 3.8.1.1.a presently requires demonstrating the operability of the remaining AC sources within one hour and at least once per eight hours thereafter. Action Statement 3.8.1.1.a allows an outage of 72 hours for the diesel generator or the offsite circuit. The demonstration of operability has been changed to allow performance of Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours. The requirement for performing 4.8.1.1.2.a.4 once every eight hours thereafter, has been deleted. In addition, the requirement to restore two diesel generators to operable status has been deleted since diesel inoperability is addressed in 3.8.1.1.b.

#### **Action Statement 3.8.1.1.b**

The existing action statement will be redesignated as Action Statement 3.8.1.1.c. to allow incorporation of the new action statement resulting from the proposed change to Action Statement 3.8.1.1.a. This item is identical to the diesel generator portion of the present action statement except that it specifies performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours, and allows an out-of-service time of seven days vice 72 hours. Furthermore, the requirement for performing 4.8.1.1.2.a.4. once every eight hours thereafter has been deleted.

#### **Action Statement 3.8.1.1.c**

This action statement constitutes a proposed change to the existing Action Statement 3.8.1.1.b. We have deleted the reference to "one 500 KV" offsite circuit and replaced it with "two" offsite circuits. In addition, we eliminated the phrase "... of the above required A.C. electrical power sources . . ." The current requirement is to demonstrate the operability of the remaining AC sources within one hour and once per eight hours thereafter. Also, there is a maximum out-of-service time of 72 hours for the AC sources while operating in MODES 1 thru 4. The proposed changes would allow a diesel generator to be out-of-service for up to seven days. The requirement to perform Surveillance Requirement 4.8.1.1.2.a.4 within one hour and at least once per eight hours thereafter has been deleted and replaced with the requirement to perform 4.8.1.1.2.a.4 within eight hours.

#### **Action Statement 3.8.1.1.d**

This action statement is currently designated 3.8.1.1.c. We have replaced the phrase "... two of the 500 KV above required offsite A.C. circuits . . ." with "... three offsite A.C. circuits . . ." The existing Action Statement requires performance of Surveillance Requirement 4.8.1.1.2.a.4 within one hour and at least once per eight hours thereafter, provided the diesels are not already operating. The requirement to perform 4.8.1.1.2.a.4 once every eight hours thereafter has been deleted.

#### Action Statement 3.8.1.1.e

This action statement is presently designated 3.8.1.1.d. We propose deleting the phrase "... of the above required ...". The current requirement is to restore at least two diesel generators to operable status within 72 hours upon loss of the first diesel generator. The proposed changes would allow one generator to be out-of-service for up to seven days in accordance with Action Statement 3.8.1.1.b, as long as the other diesel generator has been demonstrated operable and returned to service within 2 hours.

#### JUSTIFICATION

The proposed changes to Action Statements 3.8.1.1.a, b, and c are being made to enhance safe operations of the plant during transient conditions and to reduce the number of unnecessary test starts on the diesel generator.

In support of our request to relax the requirement to demonstrate diesel operability under Action Statements 3.8.1.1.a, 3.8.1.1.b, and 3.8.1.1.c, we point out that any operational occurrence involving a loss of an AC power source necessitates extensive attention and recovery actions by the Control Room Operator to place the plant in a safe condition. Although the demonstration of operability of diesel generators is a very important recovery action, the result of this action rarely has any direct mitigating effect on the condition of the plant following a transient, but assures diesel generator operability in the event of a subsequent transient.

Extensive operating history at our facility indicates, in our judgment, that a one hour action statement may have the potential during certain transients to distract the operator from the immediate concern of placing the plant in a safe shutdown or stabilized condition. Based on our experience and the low probability of a subsequent transient we feel an eight-hour action statement for the proposed 3.8.1.1.c, and a 24-hour action statement for 3.8.1.1.a and the proposed 3.8.1.1.b are more appropriate. We do not perceive that the incremental exposure to potential unavailability is as severe a risk, when considering the availability of other backup AC sources, as is the risk to plant safety resulting from operator distraction during actual plant transients in attempting to meet the Technical Specification requirement. The priority should be to complete the actions necessary to place the plant in a safe condition from a previous transient before establishing the conditions necessary to mitigate a low probability event that may follow.

Deleting the requirement for retesting a diesel generator every eight hours following entry into the action statements will reduce the number of starts and decrease the potential for overstressing rotating parts as a result of paralleling operations. Concern has been expressed in NUREG/CR-0660, NUREG-1024, Generic Letter 83-41, Generic Letter 84-15, and by the manufacturer for needless testing of the diesel generators. It is our judgment that the existing action statements impose measures that appear to be more punitive, when evaluated in the light of the potential for degrading safety, than those action statements designed to optimize overall risk by specifying appropriate testing frequencies. Hence, we are requesting a deletion of the eight hour retest requirement, and a relaxation of the one-hour action statement for demonstrating diesel generator operability.



The Calvert Cliffs facility has available the 69 KV SMECO TIE as a reliable offsite circuit. The SMECO TIE is a fully qualified backup as described in the NRC Safety Evaluation Report issued under License Amendment Numbers 92 (Unit 1) and 73 (Unit 2). Additionally, another Safety Evaluation issued in support of License Amendments 58 and 40 for Units 1 and 2 concluded that the SMECO TIE meets all requirements for use as "... an independent preferred source of offsite electrical power as stated in General Design Criterion 17, Appendix A to 10 CFR 50". A recent change to the Limiting Condition for Operation (LCO) 3.8.1.1.a integrated the SMECO TIE as a qualified offsite circuit. Of the three available offsite circuits (two 500 KV circuits, and the 69 KV SMECO circuit), the LCO requires only two of the circuits to be OPERABLE. The action statements do not reflect this. Accordingly, we propose to change existing Action Statements 3.8.1.1.a, b, and c to read that one more offsite circuit, than currently listed, must be INOPERABLE before entering the respective action statement. This is not a reduction in safety due to a relaxation since it merely reflects the intent of the Limiting Condition of Operation, and is administrative in nature.

In Action Statement 3.8.1.1.b we request a seven day out-of-service action statement for diesel generator inoperability. We have determined from maintenance history at our facility that a seven day out-of-service period is the minimum necessary to perform extensive scheduled maintenance adequately. This minimum period has been substantiated through a thorough search of diesel generator maintenance history at Calvert Cliffs. The increase in diesel generator unavailability brought about by this proposed change is offset by several major factors. In NUREG 1024, a genuine concern is expressed about out-of-service times that are too short. The feeling is that a 72-hour limit may be too stringent and fail to promote and encourage proficient and thorough maintenance and repair. This point is reemphasized in Generic Letter 84-15. Studies of diesel generator maintenance history at Calvert Cliffs indicate a strong need for longer allowed periods of inoperability to accommodate uninterrupted maintenance. Some surveillance test and preventive maintenance procedures require in excess of 72 hours to perform. A relaxation of the current 72-hour requirement will allow maintenance personnel to effect repairs and maintenance in a less stressful manner.

By increasing the allowable diesel generator out-of-service period, there follows a reduction in the risk of a loss of AC power incident. When a plant is shut down due to a failure to meet the Limiting Conditions of Operation, it is actually placed in a more vulnerable condition because of the loss of AC self-sustaining power. The recently completed Interim Reliability Evaluation Report (IREP) for Calvert Cliffs estimated the loss of offsite power, Loss of Coolant Accident (LOCA), and diesel generator unavailability upon demand probabilities. These results provide additional insight into the risk of a loss of offsite power versus a LOCA. The probability of a loss of offsite power was estimated to be .14/yr. The probability of a small-small break (-1.9" diameter) LOCA was estimated to be  $2.1 \times 10^{-2}$ /year with a small or large break (Design Basis) LOCA estimated at  $2.4 \times 10^{-4}$ /year and  $2.3 \times 10^{-4}$ /year respectively. A loss of offsite power must also occur simultaneously with any of the LOCA's to result in a need for diesel generators. This shows that a loss of offsite power is approximately a factor of 50 greater than a LOCA in requiring diesel generator availability. These facts reemphasize the importance of minimizing the plant vulnerability to a loss of offsite power event.

We have proposed these changes to minimize the potential for degraded conditions that is currently exacerbated by adherence to the action statements. The following discussion deals primarily with changes proposed to the surveillance requirements. In the following discussion, the proposed change to each surveillance requirement and its justification appears under individual headings of "Surveillance Requirement. . ."

#### **SURVEILLANCE REQUIREMENT 4.8.1.1.2.a.**

This item currently requires the listed surveillances to be performed at least once every 31 days on a STAGGERED TEST BASIS. We propose eliminating any reference to a STAGGERED TEST BASIS. Based on the definition in the Technical Specifications, this term causes individual diesel generators to be tested more often than once per 31 days. The definition requires splitting the testing frequency in equal subintervals by dividing the specified test interval into n subintervals, with n equal to the number of systems. This has no effect on those surveillance requirements with one system but causes the diesel generators to be tested more often than required. Generic Letter 84-15 recommends eliminating needless diesel generator starts. Excessive diesel generator testing, when not required, can be performance degrading, and consequently diminish safety. Therefore, as recommended in Generic Letter 84-15, we are proposing this change to Surveillance Requirement 4.8.1.1.2 to minimize performance degrading diesel generator testing. Our goal is to ensure that diesel generator start testing is performed no more often than once every 31 days per diesel generator. In order to minimize safety-degrading diesel engine starts, the Generic Letter recommends similar approaches.

#### **SURVEILLANCE REQUIREMENT 4.8.1.1.2.a.4**

This surveillance requirement calls for starting the diesel generator at the prescribed frequency under ambient conditions. The proposed change would delete the required ambient starting condition and allow by footnote any manufacturer recommended warm up or prelube period. The intent is to eliminate cold fast starts and thereby reduce safety-degrading test requirements.

Existing surveillance requirements impose many fast starts. Additionally, many of the starts are required to be in an ambient condition which subjects the diesel engine to undue wear and stress on engine parts. Both excessive starts and ambient testing have been identified to degrade diesel generator reliability. Concerns were expressed in Generic Letters 83-41 and 84-15 regarding the imposition of severe mechanical stress and wear on the diesel engine due to frequent cold fast starts. In response to the NRC request for voluntary information (Generic Letter 83-41) on cold fast starts, an investigation was performed at Calvert Cliffs that revealed the following information:

- " . . . Past inspections of No. 12 diesel generator (our most frequently used machine) have produced two notable deficiencies. Both involve out-of-specification clearances on machined rotating parts associated with the upper and lower crankshafts (lead angle clearance) and impeller lobe clearances on the scavenging air blower. The

clearances associated with the lobes of the blower are directly related to the crankshaft lead angle since the driver for each lobe is directly coupled to the output of each crankshaft. Both of these deficiencies have been determined to be a result of dimensional deformation of the shaft keys in the lobe and vertical drive shafts which transmits the torsional load of both the upper and lower crankshafts. This dimensional deformation is caused primarily by the forces applied during instantaneous engine slowdown resulting when sudden load is applied. The principal contributions to sudden load applications are:

- (1) The application of sequential electrical loads similar to those produced by the Loss of Coolant Accident (LOCA) Sequences during actual or simulated demand starts.
- (2) Paralleling operations during surveillance testing to demonstrate operability of the diesel generator.

Of these the two operational events mentioned above, paralleling operations have the greatest potential for producing damaging load conditions ..."

It should be noted that load paralleling is performed in almost every case at our facility.

It is our technical judgment that an overall improvement in diesel engine reliability and availability can be gained by reducing diesel generator starts. Hence, we are requesting the proposed change to Surveillance Requirement 4.8.1.1.2.a.4 to help eliminate needless safety-degrading diesel starts. We feel the provisions of the existing surveillance requirement impose measures that appear to be more damaging than those designed to optimize overall risk by specifying appropriate testing frequencies.

#### **SURVEILLANCE REQUIREMENT 4.8.1.1.2.b**

The existing surveillance item specifies ASTM D975-68 as the standard of reference for diesel fuel oil sampling requirements. The proposed change updates the sampling reference to ASTM D975-81, the current standard used at Calvert Cliffs. This change was recommended by the NRC Project Manager and reflects no actual change in chemistry specifications. Accordingly, this proposed change is administrative in nature.



#### SURVEILLANCE REQUIREMENT 4.8.1.1.2.c

This surveillance requirement is a new addition. The proposed addition requires starting each diesel at least once per 184 days in an ambient condition and accelerating to at least 900 rpm in less than or equal to 10 seconds. This surveillance performs the same test as item 4.8.1.1.2.a.4 currently does only at a different frequency and under ambient conditions. This new testing frequency is recommended in Generic Letter 84-15 as a means of reducing premature degradation of rotating parts brought about by non-prelubricated testing.

#### SURVEILLANCE REQUIREMENT 4.8.1.1.2.d.3.c

The current Surveillance Requirement 4.8.1.1.2.c.3.c. is to be redesignated 4.8.1.1.2.d.3.c. This item verifies that all diesel generator trips, except engine overspeed, crankcase high pressure, lube oil low pressure, generator ground overcurrent, and generator differential are automatically bypassed on a Safety Injection Actuation Signal (SIAS). Review of the Updated Final Safety Analysis Report for Calvert Cliffs and an examination of the diesel generator protection system schematics show that the only diesel generator trips bypassed by SIAS are the jacket coolant temperature and pressure trips. Since the bypassed trips are not explicitly obvious and are a source of confusion to anyone not familiar with the system, we propose a change to clarify explicitly the trips which should be verified bypassed on a SIAS. This change would remove all doubt regarding the surveillance requirement. The remaining diesel generator protective features and trips are necessary to prevent extensive damage to the diesel engine and generator, and thereby help maintain a reliable emergency source of power to operate the required equipment following an accident. These features are not bypassed on receipt of a SIAS. Therefore, we request the surveillance requirement be reworded to verify the high jacket coolant temperature and low jacket coolant pressure trips are automatically bypassed on a SIAS.

Current studies at Calvert Cliffs show that our individual diesel generator reliability is 97-100%. We feel our diesel generator reliability maintenance program is capable of maintaining a minimum of 95% reliability. Our maintenance history supports this contention. In addition, we will continually compile diesel generator reliability data, and if reliability should fall below 95%, we will institute a program to improve the individual diesel generator reliability. Due to the success of our present policies, we believe no other changes or additions are necessary.

However, efforts are underway, and in combination with the proposed amendments to the Technical Specification, these efforts are aimed at improving diesel reliability. We are currently evaluating proposals from the diesel generator manufacturer to improve the diesel lube oil system by modifications designed to ensure adequate engine lubrication upon demand.

Diesel Lube Oil system modifications are being considered to guarantee prelubed condition upon fast start. This will ensure safety-degrading cold fast starts can be eliminated and therefore improve overall reliability. There are two modifications undergoing analysis and evaluation.

- (1) Engine prelube system designed to maintain continuous warm lube oil flow through diesel when shutdown. This modification is intended to lubricate the lower internals up to the upper crankline.
- (2) Lube oil injection system designed to instantly lubricate upon demand. This modification uses pressure from the air start system and a bladder-type container to inject oil at high pressure into the engine when air start system demand is actuated.

Data is continuously collected for the Diesel Reliability Trending Program. The information gathered from surveillance tests will be used to trend present diesel generator reliability in a formal program. This will aid the staff at Calvert Cliffs predicting potential problems before they become catastrophic.

Considering the critical role diesel generators play in mitigating various transients and postulated events following a loss of offsite power, we feel an improvement in diesel generator reliability can provide an early solution to USI A-44, Station Blackout. It is our judgment that timely actions to improve diesel generator reliability will have a significant safety benefit. The Technical Specification changes we have proposed would have a notable impact on assuring that the reliability of diesel generators at Calvert Cliffs is maintained at an acceptable level.

#### DETERMINATION OF SIGNIFICANT HAZARDS CONSIDERATIONS

We have reviewed these proposed changes against the requirements of 10 CFR 50.92 and have determined that operation of the facility in accordance with these proposed changes would not:

- (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or
- (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) involve a significant reduction in a margin of safety.

By strict application of the criteria contained in 10 CFR 50.92, however, the proposed changes to Technical Specification 3.8.1.1 must be treated as a Significant Hazards Consideration in that they represent a relaxation in the action statements for restoring an inoperable diesel generator and offsite circuit to service and testing the diesel generator to verify operability. Therefore, in accordance with 10 CFR 50.59, we are submitting this proposal for NRC review.



Mr. James R. Miller  
October 12, 1984  
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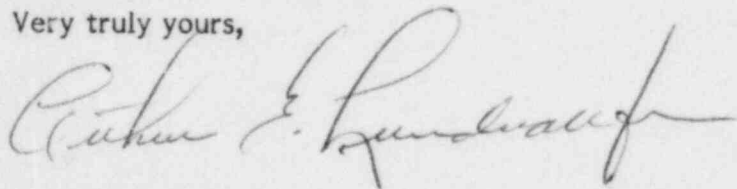
**SAFETY COMMITTEE REVIEW**

These proposed changes to the Technical Specifications and our determination of significant hazards have been reviewed by our Plant Operations and Off-Site Safety Review Committees, and they have concluded that implementation of these changes will not result in an undue risk to the health and safety of the public.

**FEE DETERMINATION**

Pursuant to 10 CFR 170.21, we are including BG&E Check Number A300533 in the amount of \$150.00 to cover the application fee for this request.

Very truly yours,



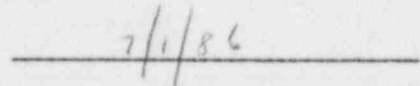
STATE OF MARYLAND :  
                              : TO WIT:  
CITY OF BALTIMORE :

Arthur E. Lundvall, Jr., being duly sworn, 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 current 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:



My Commission expires:



AEL/SRC/ms

cc: D.A. Brune, Esquire  
G.F. Trowbridge, Esquire  
D.H. Jaffe, NRC  
T. Foley, NRC  
T. Magette, DNR