BALTIMORE
GAS AND
ELECTRIC

1650 CALVERT CLIFFS PARKWAY • LUSBY, MARYLAND 20657-4702

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April 1, 1993

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; Onsite Power Distribution Systems, A.C. Distribution - Operating

Gentlemen:

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

DESCRIPTION

The proposed amendment will make changes to Technical Specification 3.8.2.1, A.C. Distribution - Operating, for Units 1 and 2, by adding an Action Statement for the condition when a 120 Volt Alternating Current (VAC) vital bus is powered by the inverter backup bus.

This change is similar to provisions in NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants." Strict adoption of the provisions of NUREG-1432 would require substantial revision to the Calvert Cliffs Technical Specifications and is not warranted at this time. Combustion Engineering Standard Technical Specifications (NUREG-0212, Revision 2) do not address the condition of having a 120 VAC vital bus powered by the inverter backup bus.

BACKGROUND

The 120 Volt Vital AC System (see Attachment 1) is designed to supply continuous power to plant vital instrumentation and control systems. The system is divided into four separate and redundant distribution busses (4 - 120 VAC vital busses). These busses provide power to the four independent channels of the Reactor Protective System (RPS) and the Engineered Safety Features Actuation System (ESFAS). Each bus is normally supplied an uninterruptible source of power from a Direct Current/Alternating Current (DC/AC) inverter. The inverter's normal DC input power is supplied by two battery chargers. Emergency power is supplied by a 125-VDC battery. The battery is kept on

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float charge by the battery chargers and powers the DC bus in a loss of off-site power (LOOP). Each battery charger is connected to a Class 1E 480-VAC load center. This system ensures that the vital AC equipment will be supplied power in the event of a LOOP.

When an inverter is out-of-service, the 120 VAC vital bus is de-energized and Specification 3.8.2.1 provides an allowed outage time (AOT) of eight hours to return the vital bus to Operable status. The associated channel of RPS and ESFAS sensors fail safe to the tripped position upon loss of power. This provides one logic trip signal of the two-out-of-four logic trip signals required to actuate a protective action in all of the sensor channels of RPS and ESFAS and significantly increases the probability of an inadvertent actuation. In addition, one of the two actuation channels may be de-energized which would make one safety train inoperable.

The 120 Volt Vital AC System is designed so that the vital busses have a backup source of power which can be used to re-energize the vital bus. With an inoperable inverter, the 120 VAC vital bus can be manually switched from the inverter to an inverter backup bus. The vital bus is switched from the inverter to this backup bus by a key interlock switch which bypasses the inverter. The interlock allows only one vital bus to be powered by the inverter backup bus at a time.

The inverter backup bus is fed from a Class 1E 480/120 VAC regulated transformer (diesel backed). Therefore, the inverter backup bus is an interruptible source that is de-energized in a LOOP and re-energized when the emergency diesel generator (EDG) is connected to the 4 kv bus. Because the design of the 120 Volt Vital AC System is to provide continuous power to instrument and control circuits, the interruptible inverter backup bus is considered a backup power source, not an emergency power source, to the 120 Volt Vital AC System.

Under normal conditions, if a LOOP occurs, only the RPS and ESFAS sensors which detect LOOP conditions actuate to the tripped position. Should a LOOP occur while a 120 VAC vital bus is aligned to the inverter backup bus, the vital bus will experience an interruption of power until the diesel restores power to the inverter backup bus. This causes all sensors for the RPS and ESFAS channels on this vital bus to trip. In addition, an actuation channel may be de-energized resulting in an EDG not receiving an undervoltage signal. This interruption constitutes an inability of the vital bus to perform its design function of supplying continuous power during a Design Basis Event. As such, a 120 VAC vital bus is considered inoperable when aligned to the inverter backup bus. Current practice is to declare the 120 VAC vital bus inoperable and enter the eight-hour Action Statement as required by Technical Specification 3.8.2.1.

The current AOT of eight hours is insufficient time to complete most repairs and post-maintenance testing necessary to return an inverter to Operable status. Failure to return an inoperable inverter to service in eight hours would lead to a plant shutdown. The proposed change to Technical Specification 3.8.2.1 will add a 48-hour AOT when a 120 VAC vital bus is on the inverter backup bus. This AOT will normally allow sufficient time to return an inverter to Operable status, will avoid costs of an unwarranted plant shutdown and will reduce the risks of transients while shutting down.

Utilization of the inverter backup bus to energize a vital bus when an inverter is out-of-service significantly improves the reliability of the plant safety systems when compared to having the vital bus de-energized. By using the backup bus, the RPS and ESFAS channel powered by this vital bus is able to perform its function for all analyzed design basis accidents except for those involving a concurrent LOOP. The risk of inadvertent safety system actuation while a vital bus is energized by the inverter backup bus is significantly lower than operation with a de-energized vital bus.

The result of having a de-energized actuation channel, which may happen if a LOOP occurs while a vital bus is aligned to the inverter backup bus, is equivalent to having an inoperable EDG. In either case, one train of ESFAS equipment will not operate. Current Technical Specifications allow a diesel to be inoperable for 72 hours before initiating plant shutdown. If a LOOP occurs during this 72 hours, the 4 kv bus aligned to the inoperable EDG would not be powered. This results in one train of ESFAS equipment not operating. Allowing the vital bus to be on the inverter backup bus for 48 hours is more restrictive than the AOT for an inoperable EDG. When the vital bus which powers the actuation channel is on the inverter backup bus, current practice is to declare the associated EDG inoperable and enter the appropriate Action Statement.

Of all the equipment powered by the vital bus, an inoperable sensing channel of the RPS or ESFAS System has the most limiting AOT. The corresponding Action Statement for this equipment is 48 hours. Therefore, allowing the 120 VAC vital bus to be on the inverter backup bus for 48 hours is consistent with the Action Statement for the most limiting equipment powered by the vital bus.

In addition to being consistent with the AOT for an inoperable sensing channel of RPS and ESFAS, this change will restore an AOT which was in the original Technical Specifications. The original-issue custom Technical Specifications for Calvert Cliffs Unit 1 had a 48-hour AOT for a 120 VAC vital bus being energized by the inverter backup bus. This AOT was deleted when the Technical Specifications were converted to the standard format Technical Specifications, leaving only the eight-hour AOT.

REQUESTED CHANGE

Change Technical Specification 3.8.2.1 for Unit Nos. 1 and 2 as shown on the marked-up pages attached to this transmittal (Attachments 2 and 3).

SAFETY ANALYSIS

The 120 Volt Vital AC System is designed to supply continuous power to plant vital instrumentation and control systems. Each bus is supplied an uninterruptible source of power from a DC/AC inverter. When an inverter is out-of-service, the 120 VAC vital bus can either be de-energized or powered by the inverter backup bus.

Using the inverter backup bus to supply power to the 120 VAC vital bus significantly improves the reliability of the plant safety system when compared to operating with a de-energized vital bus. The vital bus is capable of performing its function for all analyzed design basis accidents except for those involving a concurrent LOOP. Extending the AOT for a 120 VAC vital bus powered by the inverter backup bus from 8 hours to 48 hours reduces the likelihood of an unplanned plant shutdown and reduces the risk of transients while shutting down. The proposed AOT for the vital bus is more restrictive than the AOT for conditions with similar safety significance, i.e., an inoperable EDG and is equivalent to the AOT for an inoperable ESFAS channel.

DETERMINATION OF SIGNIFICANT HAZARDS

The proposed change has been evaluated against the standards of 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 amendment:

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

   The 120 Volt Vital Alternating Current (AC) system is designed to supply continuous power to plant vital instrumentation and control systems. The only event evaluated in the Updated Final Safety Analysis Report (UFSAR) potentially affected by the 120 Volt Alternating Current (VAC) vital bus being energized by the inverter backup bus is the loss of off-site power (LOOP). Allowing the vital bus to be energized by the inverter backup bus does not affect the probability of having a LOOP, since this lineup is not an initiator to the event. No precursors to any of the accidents in the UFSAR are affected when the plant is in this lineup. Therefore, having a 120 VAC vital bus energized by the inverter backup bus for 48 hours does not involve a significant increase in the probability of an accident previously evaluated.

   The consequences of having a LOOP while a 120 VAC vital bus is energized by the inverter backup bus are the same for the existing 8-hour Action Statement and the proposed 48-hour Action Statement. In either case, if there is a LOOP while a vital bus is on the inverter backup bus, the vital bus will experience an interruption of power until the diesel restores power to the inverter backup bus. This causes the Reactor Protective System (RPS) and Engineered Safety Features Actuation System (ESFAS) sensors on the channel powered by this vital bus to trip and increases the possibility of an inadvertent actuation.

   This interruption of power may also cause an actuation channel to be de-energized resulting in an emergency diesel generator (EDG) not receiving an undervoltage signal. The result of having a de-energized actuation channel is equivalent to having an inoperable EDG: one train of ESFAS equipment would not be operable. As current Technical Specifications allow an EDG to be inoperable for 72 hours, allowing a vital bus to be powered by the inverter backup bus for 48 hours is more restrictive. For all other analyzed initiating events, the vital bus energized by the inverter backup bus will still perform its function.

   While the consequences of the two allowed outage times (AOTs) for the vital bus remain the same, the probability of the interruption of power increases because the AOT for the vital bus has increased. However, as the probability of a loss of offsite power is small, this increase in probability is not significant.

   Therefore, this change will 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 change to add an Action Statement to the AC Electrical Distribution System Technical Specification to allow a 120 VAC vital bus to be energized by the inverter backup bus for 48 hours does not represent a change in the configuration of the plant. Specifically, no new hardware is being added to the plant as part of the proposed change nor are there significantly different types of operations being introduced. Allowing a vital bus to be

powered by the inverter backup bus for 48 hours does not create the possibility of a new or different type of accident. Therefore, this change would 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 the margin of safety.*

The proposed change to add an Action Statement to the AC Electrical Distribution System Technical Specification to allow a 120 VAC vital bus to be powered by the inverter backup bus for 48 hours does not represent a significant reduction in the margin of safety. By using the inverter backup bus to supply power to a 120 VAC vital bus, the RPS and ESFAS channel, which would be in the tripped position if the vital bus was de-energized, is able to perform its function for all analyzed design basis accidents except for those involving a concurrent LOOP.

During a LOOP, the vital bus powered by the backup bus will experience an interruption of power until the EDG restores power. This causes all sensors for the RPS and ESFAS channels on this vital bus to trip. In addition, an actuation channel may be de-energized resulting in an EDG not receiving an undervoltage signal. The result of having a de-energized actuation channel is equivalent to having an inoperable EDG: one train of ESFAS equipment would not be operable. Current Technical Specifications allow an EDG to be inoperable for 72 hours. The proposed change allows a vital bus to be on the backup bus for 48 hours and is therefore more restrictive than the AOT for an inoperable EDG.

Currently, the Technical Specifications have an AOT of eight hours for a de-energized vital bus. Using the inverter backup bus to energize a 120 VAC vital bus when an inverter is out-of-service improves the reliability of the safety protection system when compared with operating with a de-energized vital bus. Therefore, the proposed change would not involve a significant reduction in the margin of safety.

Based on the above, we have concluded that these changes do not constitute a significant hazard.

ENVIRONMENTAL ASSESSMENT

The proposed amendment changes 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 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 Part 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 October 1, 1993. Issuance of this amendment does not have an impact on outage completion. However, delay in approval of this change could have an impact on continued plant operation if an inverter fails.

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 the Off-Site Safety Review Committee. They have concluded that implementation of theses 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 1st day of April, 1993, 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:

Donna L. McCready
Notary Public

My Commission Expires: January 1, 1994
Date

RED/LMD/lmd/dlm

Attachments: (1) 120 Volt Vital AC System
(2) Unit 1 Technical Specification Pages
(3) Unit 2 Technical Specification Pages

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
R. A. Capra, NRC
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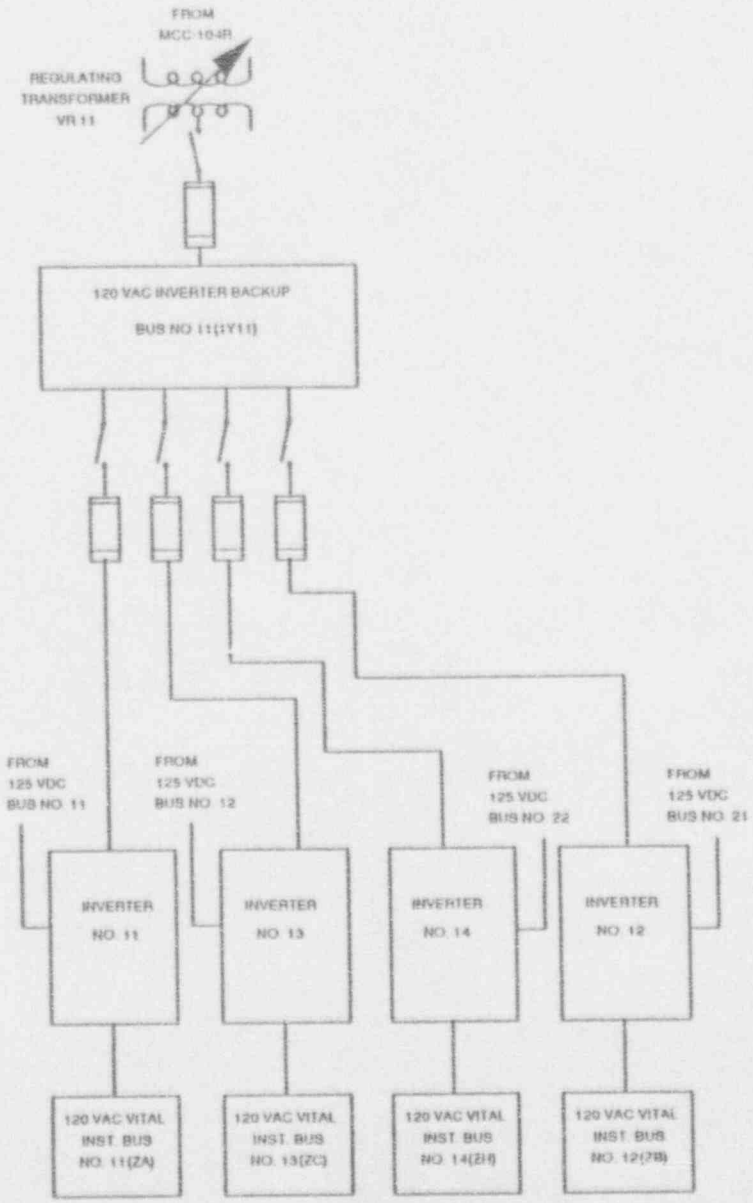
ATTACHMENT (1)

120 VAC VITAL ELECTRICAL POWER DISTRIBUTION SYSTEM FUNCTIONAL DIAGRAM *



* NOTE: This drawing depicts the Unit 1 120 VAC Vital Electrical Power Distribution Systems. The Unit 2 System is similar.