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GEORGE C. CREEL
VICE PRESIDENT
NUCLEAR ENERGY
(301) 260-4455

December 13, 1990

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
Supplement to the Station Blackout Safety Evaluation Response (TAC Nos. 68525 and 68526)

REFERENCES: (a) Letter from Mr. G. C. Creel (BG&E) to NRC Document Control Desk, dated November 13, 1990, Response to Station Blackout Safety Evaluation

Gentlemen:

This letter provides the additional information concerning our evaluation of the loss of offsite power described in Reference (a). The primary issue raised in the NRC Safety Evaluation for station blackout concerned the reliability of our offsite power sources. Specifically, a transistor failure caused the loss of an offsite line following a ground fault.

During a meeting with the NRC Staff on November 1, 1990, the loss of offsite power event was discussed. Several issues remained unclear at the conclusion of that meeting. The main concern was the ability of the relay panel components to withstand the effects of the surge current following a ground fault. The attachment provides more detail concerning the response of the relay panel to the ground fault experienced on July 23, 1987. This information supports the determination that the equipment failure was random and not symptomatic of inadequate surge protection or other design flaw. Based on this information, we request that the NRC revise the Station Blackout Safety Evaluation for Calvert Cliffs to reflect this information and reestablish our coping duration as four hours.

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B245052100

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

Very truly yours,

GCC/PSF/psf/dlm

Attachment: As Stated

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
R. A. Capra, NRC
D. G. McDonald, Jr., NRC
T. T. Martin, NRC
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ATTACHMENT

EVALUATION OF TRANSISTOR FAILURE FOLLOWING A GROUND FAULT

This attachment is prepared in a question and answer format with the questions derived from NRC concerns stated during a meeting held with the NRC Staff on November 1, 1990.

Question

When was the static relay panel last tested before the 1987 loss of offsite power event?

Response

The relay panel was tested on March 16, 1987, and the transistor was operational at that time.

Question

Will the same type of relay panel be used for the future 500 kv transmission line between Calvert Cliffs and PEPCO's Chalk Point generating station?

Response

The equipment used on the existing 500 kv line at Calvert Cliffs is no longer manufactured by General Electric. We have not yet purchased relay panels for the proposed 500 kv tie line to Chalk Point, and when purchased, they will be different from the existing equipment.

Question

How many faults have occurred on the 500 kv and 230 kv system where these static panels are used? Did this particular transistor fail during these faults?

Response

System records are not readily available for the period prior to 1979. However, a review of the system operator logs from 1979 through the present for breaker operations on these lines was performed. This review showed that this transistor has never failed as a result of being subjected to fault currents.

The data shows there were at least 36 events where these lines experienced a fault current. One of these was the Calvert Cliffs loss of offsite power event. In many cases, the faults were momentary and the breakers re-closed immediately. Not all of the faults, or suspected faults, resulted in loss of service because parallel lines remained in service. In a few cases, such as the event at Calvert Cliffs, generation was lost. In the seven events other than the Calvert Cliffs event where breakers operated on parallel lines, this transistor did not malfunction. It should be noted that these relays also sense fault currents due to short circuits elsewhere in the system and must operate properly to prevent trips in these cases. Therefore, the relays have been challenged more than the 36 known events derived from the operators' logs.

Question

Does the static relay panel have adequate surge protection to withstand the effects of a 500 kv fault?

Response

The panel has surge protection on all of its external interfaces. These interfaces include current and potential transformer inputs from the 500 kv circuits, the DC power control source, and the control outputs to operate the breakers. No failures have occurred close to the surge protection interfaces, therefore, there is no indication that the surge protection is inadequate.

The transistor that failed was not directly connected to an outside interface. The card on which this transistor was installed is sheltered from outside influences by other similar cards. The input and output signals for the timing circuit card go through other similar cards containing the same model transistor. None of the other transistors failed during the loss of offsite power event. The failed transistor is one of nine identical transistors on the timing circuit card. Although some of the other transistors on the card were more electrically exposed than the failed transistor, they did not fail. Therefore, the failed transistor was shown to be adequately protected from the fault current surge because it was less electrically exposed than other identical transistors. Therefore, the transistor failure was not caused by the fault and is determined to be a random failure.