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DUKE POWER

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: McGuire Nuclear Station
Docket Nos. 50-369, -370
Inspection Report No. 50-369, -370/91-09
Electrical Distribution System Functional Inspection
Response to Finding on Breaker Miscoordination

Gentlemen:

Please find attached Duke Power Company's response to the subject finding. This response addresses our plans and schedule for resolving this finding. An additional response will be submitted as indicated in the attachment to provide the results of the evaluation regarding the feasibility of providing full coordination in DC panelboards for branch circuit protection.

Should there be any questions concerning this matter, contact L.J. Rudy at (704) 373-3413.

Very truly yours,

M.S. Tuckman

LJR/s

Attachment

xc (W/Attachment):
S.D. Ebner
Regional Administrator, Region II

T.A. Reed, ONRR

P.K. VanDoorn
Senior Resident Inspector

TEO1

MODIFICATION DESCRIPTION

As noted in the NRC Inspection Report, the 125 VDC Vital Instrumentation and Control (EPL) system is not selectively coordinated above a certain level of fault current. Since the system is shared between units 1 and 2, this could potentially result in a trip of both units if this specific fault were to occur. Each of the four batteries supply one distribution center which in turn supplies one DC panelboard per unit. Coordination cannot be guaranteed in the instantaneous region of the molded case circuit breakers located in the distribution center and the panelboards. This characteristic may cause the battery circuit breaker to operate due to a fault in a panelboard.

Several options have been evaluated to improve coordination of the EPL system. A search did not uncover a molded case circuit breaker which would improve coordination. The more advanced features of AC molded case circuit breakers are not available for DC applications.

The most feasible solution is to replace the charger circuit breaker, battery circuit breaker, main circuit breaker and cross-tie circuit breaker (indicated by an asterisk on the attached drawing) with non-fusible and fusible switches. The addition of fuses will allow the circuit breakers closest to the fault to clear before isolating the battery from the bus. This will decrease the possibility of a fault causing a loss of power which would trip both units. In the cross-tied configuration, the fuses will help insure that the bus without a battery will be cleared successfully under a fault condition without isolating the battery from the other bus.

Even with the replacement of the circuit breakers described above, one unit could trip as a result of a fault beyond one of the panelboard branch circuit breakers. Both the panelboard feeder circuit breaker and the branch circuit breakers have thermal-magnetic elements, so they will not coordinate during the instantaneous region. However, this is similar in consequence to the case postulated in the PSAR where the panelboard is lost and the other train is used.

The feasibility of providing full coordination in DC panelboards for branch circuit protection has not been fully determined. Concerns such as space limitations and plant operation during the modification must be considered further. The evaluation of this option will continue for the next 90 days and an additional response will be submitted.

TIME SCHEDULE

In order to maximize plant reliability and personnel safety, the circuit breaker replacements should be performed while the bus is not energized. The EPL system is shared therefore, all its buses are normally energized.

By aligning the inverters to their regulated bus and providing a temporary feed to the DC panelboards, the distribution center can be de-energized. In order to align the system, replace the breakers and return the system to normal, more than the Technical Specification limit of 24 hours will be needed. Therefore, a Technical Specification change will be required to extend the time for this modification.

It is preferable to replace this equipment while one unit is in an outage. The planned schedule is for two of the buses to be changed during unit 1 outage EOC-9 scheduled for March 1994, with the remaining two buses changed during the unit 2 outage EOC-9 scheduled for September 1994. This will provide adequate time to procure and qualify equipment, complete the design and address the details necessary to install the new equipment.

This time schedule considers the replacement of the charger, battery, main and cross-tie circuit breakers. The time schedule for the panelboard changes will be included in the succeeding response.

