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December 14, 1984

Dr. Thomas E. Murley, Administrator
U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Dr. Murley:

POTENTIAL CONSTRUCTION DEFICIENCY
GE SUPPLIED TOPAZ INVERTERS
HOPE CREEK GENERATING STATION

On October 9, 1984, a verbal report was made to Region I, Office of Inspection and Enforcement representative, Mr. E. Kelly, advising of a potentially significant construction deficiency concerning the low voltage cut off setting on Topaz inverters supplied by General Electric. On November 8, 1984, an interim report was submitted to your office. The following final report is provided in accordance with 10CFR50.55(e).

Description of the Deficiency

Our Architect/Engineer and Constructor, Bechtel, has advised us that the low voltage cut off and turn-on adjustment for GE Class 1E inverters was set too high by the original manufacturer, Power Mark, a division of Topaz. The GE dedication process was checking for an operable range of 105 to 140 volts DC, instead of 100 to 140 volts DC. Topaz had been routinely setting the low voltage cut off at 105 volts DC. General Electric has specified typical DC bus voltages to range from 108 to 132 volts with momentary voltage dips to 105 volts DC during the startup of large DC loads. This results in a condition where the inverter may not start or restart until the voltage is increased, not just to 105 volts DC, but to above 118 volts (13 volt fixed offset). Since the allowable momentary dip of the input bus voltage is equal to the

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factory preset inverter low voltage cut off (105VDC), the concern was that this dip could result in an inverter trip and a failure to restart during a design base accident.

Safety Analysis

Bechtel has investigated the problem and determined that Topaz inverters have only been supplied to Hope Creek by GE, for use in panels H11-P617, P-618, P-620, P-621, P-640 and P-641. The safety systems affected by these panels are RHR, Core Spray, HPCI and RCIC.

Bechtel Project Engineering has performed an analysis of safety implications and determined that the Hope Creek DC system design is such that the battery capacity is sufficient to maintain the system voltage above 105 volts during the design basis accident (DBA) upon loss of the battery charger for four hours. The DBA loading includes starting and operating required loads during this period, and the only time in which the system voltage may be at 105 volts is at the end of the battery duty cycle. At the end of the battery duty cycle, all safety functions will have been accomplished.

Since the batteries of the affected systems are independent and are connected to Class 1E battery chargers served by Class 1E AC power sources, it is unlikely that more than one battery system channel will be without its battery charger (in conformance with the single failure criterion). When a battery is connected to a battery charger, the system voltage is always above 105 volts for all conditions of loading.

Even when assuming a single failure of a battery charger, safe operation of the plant is not affected by the existing low voltage setpoint of the Topaz inverters. Therefore, this item related to the Topaz inverter would not impact the safe shutdown of the plant.

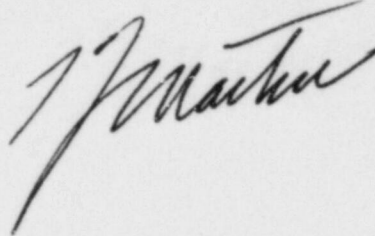
Based upon the above analysis, we conclude that the subject deficiency is not reportable in accordance with 10CFR50.55(e).

Corrective Action

General Electric will issue a Field Disposition Instruction providing for testing and adjusting as necessary the Topaz

inverters. The Instruction will specify that the inverter shall not trip at voltages between 100 and 140 VDC, and after an inverter trip, it shall resume operation when input voltage increases to 108 VDC.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'T. E. Murley', written in a cursive style.

C Office of Inspection and Enforcement
Division of Reactor Construction Inspection
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