

GENERAL ELECTRIC

NUCLEAR POWER SYSTEMS DIVISION

GENERAL ELECTRIC COMPANY • 175 CURTNER AVENUE • SAN JOSE, CALIFORNIA 95125

MC 682, (408) 925-5040

October 8, 1984

MFN# 144-84

U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Washington, D.C. 20555

Attention: Richard C. DeYoung

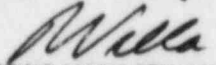
Gentlemen:

SUBJECT: 10CFR PART 21, REPORTABLE CONDITION INVERTER LOW VOLTAGE SHUTOFF

This letter is to inform the NRC of a reportable defect per 10CFR Part 21, as reported to the Emergency Response Center by G. B. Stramback, Manager of Safety Evaluation Programs on October 6, 1984.

The defect is the adjustment of the low voltage shutoff and turnon for GE dedicated inverters which was identified as being improperly set. The utilities are being notified to check and readjust as necessary. The attached evaluation identifies all pertinent information required by 10CFR Part 21.

Very truly yours,


ACTING MANAGER FOR G.G. SHERWOOD
Glenn G. Sherwood, Manager
Nuclear Safety & Licensing Operation

GGs:csc/I10028

Attachment

cc: J. T. Collins, NRC Region IV
R. C. DeYoung, NRC (2)
L. S. Gifford, GE Bethesda
J. G. Keppler, NRC Region III
J. B. Martin, NRC Region V
T. E. Murley, NRC Region I
J. P. O'Reilly, NRC Region II
C. E. Rossi, NRC I&E
G. G. Zech, NRC I&E

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1. Name and address of the individual or individuals informing the commission.

Dr. G. G. Sherwood, Manager of Safety and Licensing Operations, General Electric Company, 175 Curtner Avenue, San Jose, CA 95125.

2. Identification of the facility, the activity, or the basic components supplied for such facility or such activity within the United States which fails to comply or contains a defect.

Class 1E GE dedicated inverters, GE drawing 184C4723, supplied to BWR's as identified in number 6 below.

3. Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

General Electric Company, Nuclear Energy Business Operation, 175 Curtner Avenue, San Jose, California 95125.

4. Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

The defect is the adjustment of the low voltage shutoff and turnon for GE dedicated Class 1E inverters (GE Drawing 184C4723). This adjustment was set too high by the original manufacturer (Power Mark, a Division of Topaz). Due to engineering error, the GE dedication process was checking for an operable range of 105 to 140 volts DC, instead of 100 to 140 volts. Topaz had been routinely setting the low voltage cutoff at 105 volts DC. Typical DC bus voltages are GE specified 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 but to above 118 volts DC (13 volt fixed offset). Since the allowable momentary dip of the input bus voltage is equal to the factory preset inverter low voltage cutoff (105 VDC), this dip could result in an inverter trip and a failure to restart during a design basis accident.

The subject inverters are used to power 24 VDC instrument buses in RCIC and various Emergency Core Cooling Systems (ECCS) including HPCI/HPCS, ADS, RHR and LPCS. Other applications include the Remote Shutdown and Leak Detection Systems.

All inverters used in safety applications are redundant, either by divisional assignment or by system. Normal plant DC bus voltages typically are maintained between 125 and 131 VDC by permanent (float) chargers which are connected to the bus batteries. In order for a DC bus to drop voltage, even momentarily to 105 VDC, a single failure would most likely already have had to occur (i.e., in the battery, in its charger, in the feeder AC supply, etc.) in combination with a heavy load demand. Coincident bus voltage drops sufficient to trip the redundant inverters is likely to result only in the highly improbable event of multiple failures in combination with multiple heavy load demands. For these reasons, the probability of occurrence is extremely low, which leads to the conclusion that although the condition is reportable, no pressing safety issue exists.

5. The date on which the information of such defect or failure to comply was obtained.

October 5, 1984

6. In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for or being supplied for one or more facilities or activities subject to the regulations in this part.

Projects utilizing these inverters are listed as follows:

<u>Domestic</u>	<u>Location</u>
Limerick	C61-P001, spares
Shoreham	C61-P001, H11-P604, P612, P613, P614, spares
Hope Creek	H11-P617, P618, P620, P621, P640, P641, spares
Fermi 2	H13-P612, P613, P626, P627, spares
Nine Mile Point 2	H13-P618, P625, P629, spares
Perry	C61-P001, H13-P601, P604, P618, P629, P632, spares
River Bend	C61-P001, H13-P618, P625, P629, P632, spares
Grand Gulf	H13-P618, P625, P629, spares
Clinton	C61-P001, spares

These inverters are also used on foreign projects.

7. The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

GE has revised the inverter drawings to 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. The dedication procedure reflects these operational requirements. All inverter users will be notified by Field Disposition Instruction (FDI) to test inverter trip and restart voltages and adjust as necessary to insure that the inverters will operate at anticipated bus voltages.

8. Any advice related to the defect or failure to comply about the facility, activity, or basic components that has been, is being, or will be given to purchasers or licensees.

In addition to identifying the known locations in 6 above and the recommended actions in 7 above, GE advises that this type of problem could exist in applications beyond GE's technical information.