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SL-4311
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X7GJ17-H310

March 14, 1988

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

PLANT HATCH - UNIT 1
NRC DOCKET 50-321
OPERATING LICENSE DPR-57
SPECIAL REPORT 88-003
DIESEL GENERATOR 1C START FAILURE
RESULTS IN SPECIAL REPORT AS REQUIRED
BY TECHNICAL SPECIFICATIONS AND REGULATORY GUIDE 1.108

Gentlemen:

In accordance with the requirements of the Plant Hatch Unit 1 Technical Specifications Section 6.9.2, and Regulatory Guide 1.108, Revision 1, Section C.3.b, Georgia Power Company is submitting the enclosed Special Report (SR) concerning a start failure of the 1C diesel generator. This event occurred at Plant Hatch - Unit 1.

Sincerely,

L. T. Gucwa

LGB/1c

Enclosure: SR 50-321/1988-003

c: (see next page)

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Georgia Power

c: Georgia Power Company
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ENCLOSURE

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A. REQUIREMENT FOR REPORT

This report is required per the Unit 1 Technical Specifications section 6.9.2 and Regulatory Guide 1.108, Revision 1, section C.3.b. This section of the Regulatory Guide requires that all diesel generator start failures, valid or invalid, be reported "consistent with the licensee's reporting requirements." Unit 1 Technical Specifications section 6.9.2 requires Special Reports be submitted as required.

B. UNIT(s) STATUS AT TIME OF EVENTS

On 2/17/88, Unit 1 was in the run mode at an approximate power level of 2435 MWt (approximately 100 percent of rated thermal power).

C. DESCRIPTION OF EVENT

On 2/17/88 at approximately 0925 CST, plant operations personnel were performing plant procedure 34SV-R43-003-1S, (D/G 1C Monthly Test). The 1C Diesel Generator (D/G) was being tested per the requirements of Unit 1 Technical Specifications section 4.9.B.2 and Limiting Condition for Operation (LCO) 1-88-53 because the 1B D/G was out of service for routine preventive maintenance.

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This section of the Unit 1 Technical Specifications requires that with one D/G inoperable (out of service), the other two D/Gs be demonstrated operable per surveillance requirement 4.9.A.2.a within 24 hours and at least once per 72 hours thereafter. The 1A D/G had been run successfully earlier that same day.

On 2/17/88 at approximately 0925 CST, D/G 1C was manually started as required by plant procedure 34SV-R43-003-1S. However, the D/G failed to reach rated voltage (4160 V) in 12 seconds as required by the procedure and the Unit 1 Technical Specifications section 4.9.A.2.a.2. The actual time to reach rated voltage was approximately 18 seconds. This is a start failure per Regulatory Guide 1.108, Revision 1, sections C.2.c.(1) and C.2.e.(1) because the required voltage was not attained within the acceptable time. This is the first start failure in the last 20 valid tests of the 1C D/G.

Plant operations personnel shutdown the 1C D/G in order to investigate the problem. Plant electrical maintenance personnel were contacted to assist in the D/G trouble shooting. The field flashing circuit, fuel filter pressures, generator brushes and brush rigging, and lube oil temperature were visually inspected or checked. No problems or abnormalities were found. Maintenance personnel also replaced the fuel filter (even though the old filter did not appear to be dirty or damaged) and, as required whenever a filter is replaced, used a hand pump to ensure fuel oil was present in the fuel line to the D/G.

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On 2/17/88 at approximately 0945 CST, the 1C D/G was successfully re-started. The D/G reached rated speed and voltage in approximately 8.7 seconds, well within the required time of 12 seconds. The D/G completed its one hour loaded operability run (as required by the plant procedure and the Unit 1 Technical Specifications section 4.9.B.2) with no further problems.

Plant Operations personnel documented the failure to reach rated voltage on Deficiency Card (DC) 1-88-688 as required by the plant's administrative control procedures. They also made one-hour notification to the NRC as required by 10 CFR 50.72.

D. CAUSE OF EVENT

The exact cause of this event cannot be determined. Previous and subsequent start tests of the D/G were normal. Plant electrical maintenance personnel checked/inspected key parameters and D/G components, but they found no problems or abnormalities. Although the fuel oil supply line Fuel Filter was changed, the old filter showed no signs of damage or excessive dirt. Following filter replacement, the D/G started and reached rated speed and voltage within the required time.

The most probable cause of this event was either a momentary disruption of fuel oil flow or a problem with the generator field's self excitation circuit. However, there is no conclusive evidence to substantiate either possible root cause.

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E. ANALYSIS OF EVENT

The purpose of the three Unit 1 diesel generators (1R42-S001A, B, and C) and associated support systems (start logic, fuel oil supply, electrical relays, etc.) is to provide a reliable source of onsite electrical power for the safe shutdown of the reactor.

The diesel generators automatically start on a Loss Of Coolant Accident (LOCA) signal (low low low reactor water level or high drywell pressure) or on sensed low voltage or no voltage conditions on their respective 4160 V Emergency buses (1E, 1F, and 1G). Each of these buses supplies power to Emergency Core Cooling System (ECCS) pumps and other components (such as Plant Service Water [PSW] pumps), that are needed to ensure adequate core cooling during and following a Design Basis Accident (DBA).

These "emergency loads" are distributed among the three emergency buses and thus, among the three diesel generators. Any two of the three emergency buses (diesel generators) are capable of powering sufficient emergency loads to ensure adequate core cooling with required redundancy. A LOCA concurrent with a Loss of Off Site Power (LOSP) and a failure of a single D/G is an analyzed event.

The previous analysis for a LOCA/LOSP accident assumed the D/Gs had started, reached rated speed and voltage, and tied to their respective emergency buses within 12 seconds from the start of the accident/LOSP signal. Georgia Power Company (GPC) has recently received NRC approval on a new 10 CFR 50 Appendix K analysis using the analytical General Electric model SAFER/GESTR.

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This new analysis assumes the D/Gs reach synchronous speed in 25 seconds. The load sequencing of the core spray pumps and RHR pumps (Low Pressure Coolant Injection [LPCI] mode) and other emergency loads were therefore also assumed to be delayed 13 seconds (up to 25 seconds total). The Technical Specification revision to increase the time to synchronous speed to less than or equal to 25 seconds has not been filed, but the ECCS Response Times (Technical Specifications Table 3.3.3-3 for Unit 2) were revised. Unit 1 does not have a corresponding table, but the current "licensing basis" LOCA analysis for both units assumed an additional 13 second delay in the D/G start time and subsequent load sequencing. Calculated fuel Peak Clad Temperatures (PCT) still showed approximately 700 degrees Fahrenheit (^{o}F) of margin below the 10 CFR 50.46 limit of 2200^{o}F.

In the event described by this report, one D/G (1R42-S001C) did not reach rated speed and voltage within the 12 seconds as currently specified in the Unit 1 Technical Specifications. The actual start time of 18 seconds was, however, within the current licensing basis evaluation.

Based on the above information, it is concluded that this event had no adverse impact on plant safety.

F. CORRECTIVE ACTIONS

The corrective actions for this event included:

1. Shutting down the 1C D/G after it failed to reach rated voltage in 12 seconds.

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2. Performing a visual inspection and check of key diesel generator parameters and components including the field flashing circuit, fuel filter pressures, generator brushes and brush rigging, and lube oil temperature.

3. Replacing the Fuel Filter (although the old filter did not appear excessively dirty or damaged) and, as required whenever a filter is replaced, "priming" the fuel oil supply line using a hand pump.

4. Restarting the 1C D/G and verifying it reached rated voltage within the required time and operated for at least 60 minutes with no problems.

5. Verifying the current test interval for the 1C D/G is once per 31 days as required by Unit 1 Technical Specifications Table 4.9-1. This is the same test interval as before the start failure because the Unit 1 Technical Specifications require a test interval of once per 31 days when the number of start failures is less than or equal to one in the last 20 valid start attempts.

It should be noted the 1C D/G was tested again on 2/29/88 without benefit of "priming" or fuel filter replacement. The D/G reached rated voltage within the required time and experienced no problems.