SOUTH CAROLINA ELECTRIC & GAS COMPANY
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O. W. DIXON, JR.
VICE PRESIDENT
NUCLEAR OPERATIONS

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December 27, 1984

Mr. James P. O'Reilly
Regional Administrator
U.S. Nuclear Regulatory Commission
Suite 2900
101 Marietta Street, NW
Atlanta, GA 30323

SUBJECT: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPF-12
Special Report (SPR 84-017)

Dear Sir:

Attached is a Special Report for the Virgil C. Summer Nuclear Station. This Report is required by Nuclear Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Power Systems at Nuclear Power Plants."

Should there be any questions, please call us at your convenience.

Very truly yours,

O. W. Dixon, Jr.

RJB:OWD/lcd
Attachment

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EVENT DESCRIPTION

During surveillance testing with the Plant in Mode 5, Diesel Generator XEG-0001B (DGB) failed on two (2) separate occasions. There were no adverse consequences to the events.

CAUSE OF FAILURE

The first failure occurred on November 27, 1984 and was caused by a low oil level in the mechanical governor. After forty minutes of run time, the unit experienced large load swings and was manually tripped. The second failure occurred on November 30, 1984 and was caused by two (2) grounds on the 125 VDC control power circuitry. The ground faults on the control power circuitry were such that the unit could not detect the undervoltage condition.

The grounds were located on the positive DC bus side of the Emergency Start Pushbutton (located on the main control board) and the positive DC bus itself in containment penetration XRP-0030-ES. This condition provided two current paths through the Emergency Safeguard System (ESS) relay circuitry: (1) the normal control circuit path, and (2) through the ground connection to the positive DC bus. On initiation of the undervoltage test, the undervoltage contacts opened which should have de-energized the ESS relay and caused the diesel to start. However, due to the current path provided by the ground, the ESS relay remained energized. Under the pretest conditions, the parallel current contribution to the 6 ampere fuse in the control circuitry was minimal. When the undervoltage contacts opened, the normal control circuit was opened and only the ground circuit remained. This caused an increase in the circuit amperage which exceeded the 6 ampere rating of the control circuit fuse. After approximately twenty-five (25) seconds the fuse blew, opening the ground circuit which de-energized the ESS relay and completed the diesel start circuit. The diesel started and the test was completed without further incident.

The ground on the Emergency Start Pushbutton resulted from the rotation of the pushbutton assembly which allowed a connection to become grounded to the metal enclosure. The ground at XRP-0030-ES was due to two (2) pins shorted together.

ACTION TAKEN

Following the failure on November 27, oil was added to the mechanical governor, the unit retested and declared operable at 2040 hours on November 28.

The ground faults on the 125 VDC control power circuitry were located and cleared following the failure on November 30. To correct the fault associated with the containment penetration, the circuit was relocated to two (2) spare connectors. The Licensee corrected the ground associated with the Emergency Start Pushbutton and inspected the pushbutton associated with the other unit to verify that a similar condition did not exist. In addition, lock rings and heat shrink insulation have been installed on the switches to preclude recurrence.

SURVEILLANCE STATUS

The failure on November 27 was an invalid start failure. The run time was less than one (1) hour, and during emergency operation isochronous speed control is utilized.

The event on November 30 is considered an invalid start in accordance with Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Power Systems at Nuclear Power Plants." As previously noted, the failure of the unit to start was due to a double fault (two grounds). The ground on the Emergency Start Pushbutton alone would not have prohibited a successful start; the malfunction in the circuitry not associated with the diesel caused the failure. South Carolina Electric and Gas Company, in a letter from O. W. Dixon, Jr. to H. R. Denton dated December 14, 1984, has requested NRR Staff concurrence on this interpretation of the Regulatory Guide.

The only valid failure of "B" Diesel Generator at the Virgil C. Summer Nuclear Station occurred on December 18, 1982. Therefore, in accordance with the testing frequency outlined in Table 4.8-1 of the Technical Specifications, SCE&G will continue testing the diesel generators at least once every thirty-one (31) days.