

SUPPLEMENTARY INFORMATION

Report No.: 50-302/79-057/03L-1
Facility: Crystal River Unit #3
Report Date: 30 July 1979
Occurrence Date: 6 June 1979

Identification of Occurrence:

Both Emergency Diesel Generators inoperable contrary to Technical Specification 3.8.1.2.

Conditions Prior to Occurrence:

Mode 6 refueling.

Description of Occurrence:

At 1600 it was reported that "A" and "B" Diesel Generators were declared inoperable. Investigation revealed that both Diesel Generators were started, on separate occasions, as a function of Engineered Safeguards Response Time Test SP-135. After each Diesel Generator was started, it was synchronized and loaded in accordance with the fast start verification section of SP-354. During the respective tests, each Diesel Generator developed excessive noise and the corresponding output breaker tripped. Immediate restarts of both Diesel Generators did not produce previous symptoms. "A" Diesel Generator was returned to service at 2100 and "B" Diesel Generator was returned to service at 2230 following satisfactory completion of SP-354.

Designation of Apparent Cause:

A review of this event has resulted in a series of apparent causes stemming from procedural deficiencies. The Diesel Generator output breakers tripped on reverse power as a function of power directional relay (GGP). This could have resulted from any one, or a combination, of the following series of events.

- 1) The speed droop setting on the Diesel Generator governor remained on zero (0) when the Diesel Generator was synchronized with the grid. The fast start verification section of SP-354 did not address governor speed droop setting requirements. With the Diesel Generator in this Mode, it is felt that the load on the machine drifted down to the point where the reverse power relay actuated tripping the output breakers.
- 2) The unit/parallel switch remained in the "unit" position. SP-354 did not address the operation or position of this switch. The unit/parallel switch inserts an automatic reactive load compensation network that controls the reactive load, during transients when the Diesel Generator is in parallel with the grid.

Designation of Apparent Cause: (Cont'd)

- 2) It is felt that this contributed to the gradual loss of load on the Diesel Generator and subsequently tripped the output breakers on reverse power.
- 3) An overadjustment of the automatic voltage adjust rheostat by the on-shift operator could also have contributed to reverse power trip on the Diesel Generator output breakers. With the speed droop on zero (0) and the unit/parallel switch on "unit", overadjusting the machine voltage would increase the reactive load on the machine. This, in turn, would contribute in reducing true power output of the machine until the output breakers trip on reverse power. Investigation did reveal that there were no equipment failures and that the reverse power relay was within calibration limits.

Analysis of Occurrence:

No effect upon the plant or general public as offsite power was available. The Diesel Generator speed droop setting was in the position required for engineered safeguards actuation. Proper operation of Diesel Generator during ESS would not have been deterred.

Corrective Action:

Procedure revisions have been implemented to the applicable sections of SP-354 to include the operation of the unit/parallel switch. Proper governor speed droop settings have also been implemented into the fast start verification portion of SP-354.

Failure Data:

This is the eighth (8th) occurrence reported. Reference LER's 77-55, 94, 128, 146, 158, and 78-01. This is the first reported occurrence for output breakers tripping.