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SUBJECT: Special rept: on 941028, EDG failure occurred due to burned through wire from magnetic amplifier terminal block to field. Wire repaired & relanded to terminal block.

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**FPL**

Florida Power & Light Company, P.O. Box 128, Fort Pierce, FL 34954-0128

November 23, 1994

L-94-294  
10 CFR 50.36

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

Re: St. Lucie Unit 1  
Docket No. 50-335  
Special Report  
Date of Event: October 28, 1994  
Emergency Diesel Generator Failure

The attached Special Report is being submitted pursuant to the requirements of the St. Lucie Technical Specifications. This report provides notification of one valid failure of the 1B Diesel Generator.

Should there be any questions on this information, please contact us.

Very truly yours,

D. A. Sager  
Vice President  
St. Lucie Plant

DAS/msd

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, USNRC Region II  
Senior Resident Inspector, USNRC, St. Lucie Plant

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## NRC SPECIAL REPORT

### I. TITLE

Valid Failure of the 1B Emergency Diesel Generator due to a Burned Through Wire from the Magnetic Amplifier Terminal Block to the Field.

### II. INITIAL CONDITIONS

St. Lucie Unit 1 was in Mode 5 at the start of a refueling outage and St. Lucie Unit 2 was at 100% power.

### III. EVENT SEQUENCE

On 10/28/94 with Unit 1 in a refueling outage, plant personnel commenced Operating Procedure 1-0400050, Periodic Test Of The Engineered Safety Features. At 1758, a Loss of Offsite Power (LOOP) was initiated as part of the procedure and the 1A and 1B Emergency Diesel Generators (EDG) started and loaded. At 1858 the 1B EDG successfully completed the Load Rejection part of the procedure. Continuing with the procedure the 1A and 1B EDG breakers were opened and the 1A and 1B EDGs were stopped locally at 2205 with the emergency stop pushbuttons. At 2208 a LOOP was again initiated as part of the procedure and the 1A and 1B EDGs started and loaded. Offsite power was restored at 2235 and the 1A and 1B EDGs load was reduced to 500 KW.

At 2257 a utility licensed Reactor Operator in the Unit 1 control room saw 1B EDG megavars pegged low (reactive load in the lead) and load increasing. The Senior Nuclear Plant Operator (SNPO) at the 1B EDG reported smelling smoke and locally stopped the 1B EDG with the emergency stop pushbutton.

### IV. CAUSE OF THE EVENT

Investigation by Electrical Maintenance (EM) revealed a burned wire at a magnetic amplifier (mag-amp) terminal block. The mag-amp provides the self excitation voltage to the 1B EDG field winding. A loose connection had caused overheating and there was damage to the wire and its insulation.

The loose connection was possibly due to the use of stranded wire in a compression fitting. Due to resistance heating losses the wire burned in two causing an erroneous voltage to the 1B EDG field excitation which resulted in a loss of regulator control.

This was a valid test/valid failure as it was terminated due to an alarmed abnormal condition that would have ultimately resulted in an EDG failure.

## V. CORRECTIVE ACTIONS

1. The 1B EDG was emergency tripped by the SNPO after he smelled smoke.
2. EM personnel repaired the affected wire and relanded it to the terminal block.
3. EM personnel meggered the field current circuit, the mag-amp coils and the 1B EDG windings with satisfactory results.
4. EM personnel inspected the 1B EDG terminal blocks for similar loose connections with satisfactory results.
5. EM personnel performed the eighteen month surveillance on the 1A EDG which includes checking for loose connections.
6. Operations performed a surveillance run of the 1B EDG and declared it back in service.
7. Unit 2 EDGs do not have the same type of terminal block due to a different vendor, but will be inspected during the upcoming eighteen month surveillance.
8. FPL Site Engineering is evaluating the stranded wire/compression fitting interface.

## VI. SUPPORTING INFORMATION

-This was the first valid failure of the 1B EDG in the previous twenty valid tests and the sixth valid failure in the previous eighty-nine starts (EDG run counts began 6/12/90 when Reg Guide 1.108 was implemented into the St. Lucie Unit 1 Technical Specifications). The current number of valid tests for the 1B EDG is now ninety-one.

-The 1B EDG was out of service for approximately fourteen hours until the repair could be completed and a successful surveillance test was performed.

-Due to the failure, the 1B EDG is required to be surveilled every seven days until seven consecutive failure free tests are achieved per Technical Specification 3.8.1.1, Table 4.8-1.