

C 07/07/78

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50-335

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DOC DATE: 06/13/78
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DOCTYPE: LETTER NOTARIZED: NO
SUBJECT:

COPIES RECEIVED
LTR 1 ENCL 1

LICENSEE EVENT REPT #78-017 ON 5/14/78 CONCERNING IMPROPER SWITCHING AT THE PRATT & WHITNEY SUBSTATION COMBINED WITH INCORRECT WIRING OF PROTECTIVE RELAYS AT THE MIDWAY SUBSTATION LED TO THE DEENERGIZATION OF THE MIDWAY SUBSTATION RESULTING IN LOSS OF OFFSITE POWER TO THE SUBJECT FACILITY FOR ABOUT 3/4 MINUTES.

PLANT NAME: ST LUCIE #1

REVIEWER INITIAL: XRS
DISTRIBUTOR INITIAL: *u*

***** DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS *****

INCIDENT REPORTS
(DISTRIBUTION CODE A002)

FOR ACTION: BR CHIEF ORB#4 BC**W/4 ENCL

INTERNAL:

REG FILE**W ENCL
I & E**W/2 ENCL
I & C SYSTEMS BR**W/ENCL
NOVAK/CHECK**W/ENCL
AD FOR ENG**W/ENCL
HANAUER**W/ENCL
AD FOR SYS & PROJ**W/ENCL
ENGINEERING BR**W/ENCL
KREGER/J. COLLINS**W/ENCL
K SEYFRIT/IE**W/ENCL

NRC PDR**W/ENCL
MIPC**W/3 ENCL
EMERGENCY PLAN BR**W/ENCL
EEB**W/ENCL
PLANT SYSTEMS BR**W/ENCL
AD FOR PLANT SYSTEMS**W/ENCL
REACTOR SAFETY BR**W/ENCL
VOLLMER/BUNCH**W/ENCL
POWER SYS BR**W/ENCL

EXTERNAL:

LPDR'S
FT PIERCE, FL**W/ENCL
TIC**W/ENCL
NSIC**W/ENCL
ACRS CAT B**W/16 ENCL

A/04

DISTRIBUTION: LTR 45 ENCL 45
SIZE: 1P+1P+2P

CONTROL NBR: 781870323

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						I-----	35	50	I
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EXECUTIVE VICE PRESIDENT BERKELEY CA 94704
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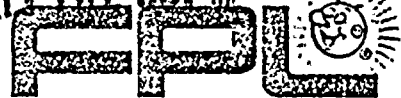
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REGULATORY DOCKET FILE COPY



FLORIDA POWER & LIGHT COMPANY

June 13, 1978

PRN-LI-78-154

REC'D
SERVICES
1978 JUL 3 PM 1 55

REC'D DISTRIBUTION
SERVICES UNIT

Mr. James P. O'Reilly, Director, Region II
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
230 Peachtree Street, N. W., Suite 1217
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

REPORTABLE OCCURRENCE 335-78-17
ST. LUCIE UNIT 1
DATE OF OCCURRENCE: MAY 14, 1978

OFF-SITE POWER

The attached Licensee Event Report is being submitted in accordance with Technical Specification 6.9 to provide 30-day notification of the subject occurrence.

Very truly yours,

A. D. Schmidt
A. D. Schmidt
Vice President
Power Resources

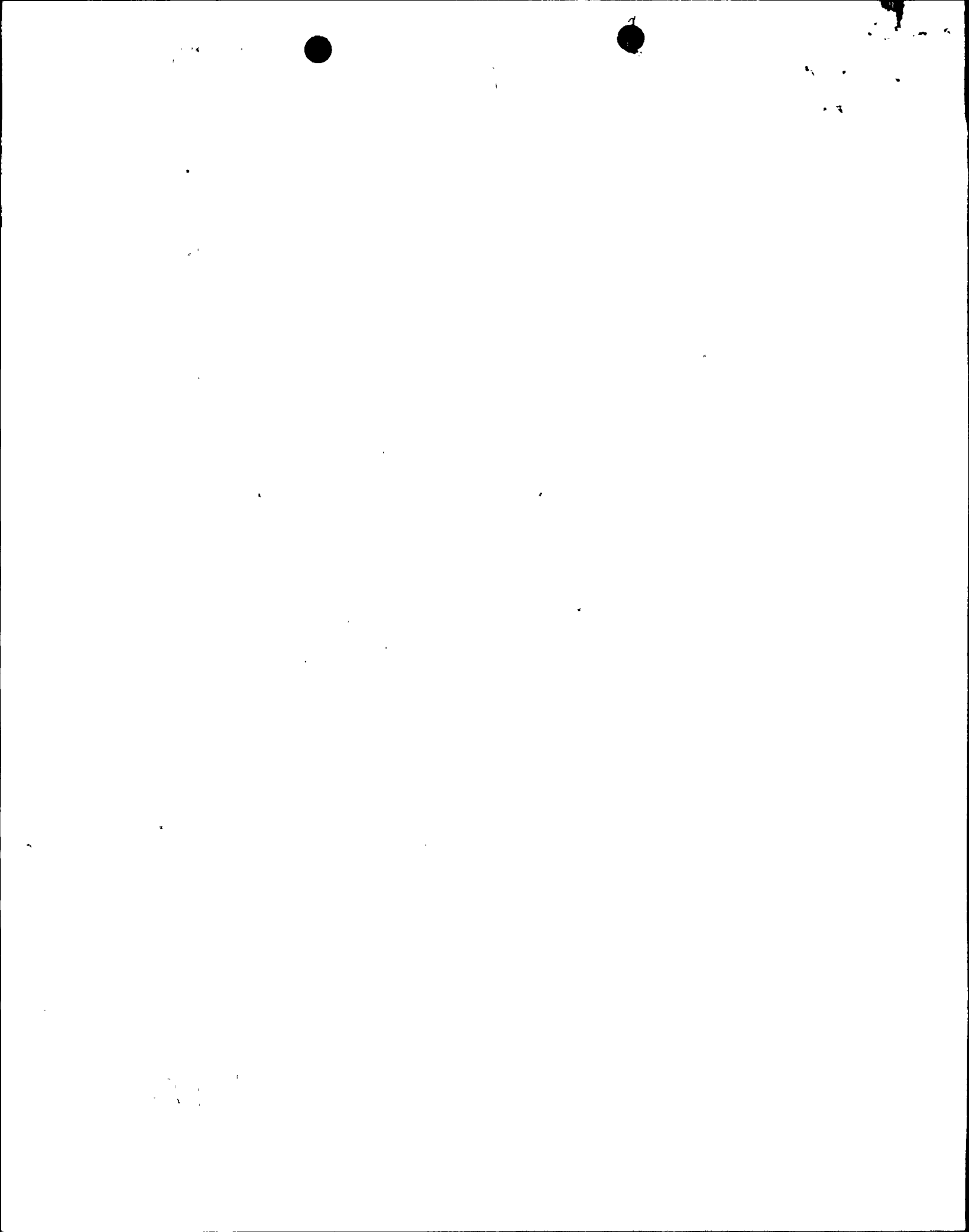
MAS/ms

Attachment

cc: Harold F. Reis, Esquire
Director, Office of Inspection and Enforcement (30)
Director, Office of Management Information and
Program Control (3)

781870323

*Acc 2
7/11*



LICENSEE EVENT REPORT

CONTROL BLOCK: [][][][][][][][] (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 F I L I S I S I 02 0101-01010101-0101 03 41111111 04 [][][] 05

CON'T
01 REPORT SOURCE L 05 0151010101313151 07 01511141718 08 01611131718 09

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES 10

02 Improper switching at the Pratt & Whitney Substation, combined with
03 incorrect wiring of protective relays at the Midway Substation, led to
04 the deenergization of the Midway Substation. This resulted in the loss
05 of off-site power to the St. Lucie Plant for about 8-1/4 minutes. One
06 on-site diesel generator was out of service for maintenance. The remain-
07 diesel generator started automatically and provided shutdown power until
08 off-site power was restored.

09 F I A 11 X 12 Z 13 C I K I T I B I R K 14 F 15 Z 16
17 718 18 01717 19 013 20 L
A 18 G 19 Z 20 Z 21 010100 22 Y 23 N 24 L 25 G 10 8 10 25

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS 27

10 The cause was improper switching at the Pratt & Whitney Substation com-
11 bined with incorrect wiring of both 240/138 kV autotransformer polarizing
12 CT circuits at the Midway Substation. The incorrect wiring has been
13 corrected, and appropriate personnel have been advised of the cause and
14 corrective action for this occurrence.

15 H 23 01010 29 NA 30 A 31 Operator Observation 32

16 Z 33 Z 34 NA 35 NA 36

17 01010 37 Z 38 NA 39

18 01010 40 NA 41

19 Z 42 NA 43

20 N 44 NA 45 NRC USE ONLY

INTRODUCTION

Florida Power & Light Co. (FPL) experienced an electrical power system disturbance on Sunday, May 14, 1978, which resulted in the loss of power to an area of the FPL system. This blacked out area included the loss of off-site power to St. Lucie Plant for approximately 8 minutes.

Fault recorder records, the West Palm Beach computer printout, and logs were used to reconstruct the sequence of events.

PRE-DISTURBANCE CONDITIONS

Only conditions in affected area are listed:

- 1 - St. Lucie Plant unit No. 1 off for refueling.
- 2 - Pratt & Whitney 240kV ring bus open (240G36835 open) prior to switching. This switch had been previously reported to be arcing. The Dispatcher believed the switch to still be inoperative.
- 3 - Two 240/138kV autotransformers (49-1035 & 49-1168) at Midway Substation were recently installed to replace smaller capacity units.

DISTURBANCE

On Sunday, May 14, 1978, at approximately 7:45AM while switching out the Pratt & Whitney-Ranch 240kV circuit for a routine clearance, a condition was created on the Pratt & Whitney south 240kV bus that caused lightning arresters on this bus to fail destructively.

Hot ionized gas from the lightning arresters caused a "C" phase to ground fault on the Midway-Ranch 240kV circuit which passes directly over the Pratt & Whitney bus.

At Midway Substation improper connection of the relay current polarizing circuit resulted in incorrect operation of the Directional Carrier Ground Relays (CLPG) on the Malabar-Midway 240kV No. 1, Malabar-Midway 240kV No. 2 and the Midway-Plumosis 138kV circuits. Erroneous current polarizing likewise resulted in failure to trip by the ground relays of the Midway terminal of the faulted Midway-Ranch 240kV circuit. Failure of this terminal to trip resulted in a back-up operation of the autotransformer tertiary relay at Midway Substation.

The Hartman-Midway and Okeechobee-Midway lines then tripped, interrupting service to St. Lucie and other stations. On-site power was supplied at St. Lucie by automatic diesel generator operation. St. Lucie remained on diesel power until after system conditions stabilized.

For given phase to ground fault, the north autotransformer tertiary relay is more sensitive than the south autotransformer tertiary relay. This accounts for the operation of only the north autotransformer tertiary relay.

The two main contributing factors to the power loss were:

- 1 - Improper switching at Pratt & Whitney Substation.
- 2 - Improper connection of both 240/138kV autotransformer polarizing CT circuits at Midway Substation.

RESTORATION

Several attempts were made to energize the north bus at Midway Substation via the Malabar 240kV No. 2 circuit. However, the lockout relay previously tripped by the tertiary relay had not been reset. The south bus at Midway Substation was energized via the Ranch 240kV circuit.

As switching continued to normalize the system, a breaker at Pratt & Whitney was closed and the original lightning arrester problem was recreated. This resulted in the deenergizing of Midway Substation.

Final reenergization of Midway Substation and St. Lucie Plant was accomplished by the closing of the Ranch 240kV circuit at 7:53:30.

This resulted in the loss of off-site power to St. Lucie Plant for approximately eight minutes and sixteen and one-half seconds.

Switching was then carried out until the entire affected area was returned to normal with the exception of Midway Substation's north autotransformer.

CORRECTIVE ACTIONS

- 1 - The improper polarizing at Midway Substation has been corrected.
- 2 - The north and south buses at Pratt & Whitney Substation have been tied together to avoid the bus high voltage problem encountered during switching.
- 3 - Drawings in use at the time were reviewed and an error was detected. As a result of this, System Protection Memorandum No. 3.10.1-A titled "The Connection of CT's In An Autotransformer When Used As a Source For Ground Polarizing Circuit" was issued May 22, 1978. This memorandum outlines the procedures for checking transformer nameplate data against FPL drawings as well as the electrical tests which are to be made. This memorandum will be incorporated into the Power Supply Procedures Manual and will prevent a reoccurrence of this event.
- 4 - System Operators and Dispatchers have been advised of the hazards of an ungrounded delta.