

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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ACCESSION NBR:9411	1300331 DOC.DATE: 94/11/23 NOTARIZED: NO	DOCKET #
FACIL:50-335 St.	Lucie Plant, Unit 1, Florida Power & Light Co.	05000335
AUTH.NAME	AUTHOR AFFILIATION	
HURCHALLA, J.A.	Florida Power & Light Co.	
SAGER, D.A.	Florida Power & Light Co.	
RECIP.NAME	RECIPIENT AFFILIATION	

SUBJECT: LER 94-007-00:on 941026, automatic reactor trip on loss of electrical load due to flashover on 240 kV switchyard potential transformer.Unit stabilized in mode 3 & transformer replaced.W/941123 ltr.

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

November 23, 1994

L-94-298 10 CFR 50.73

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

Re: St. Lucie Unit 1 Docket No. 50-335 Reportable Event: 94-007 Date of Event: October 26, 1994 Automatic Reactor Trip on Loss of Electrical Load due to Flashover on 240 KV Switchyard Potential Transformer

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

D. A. Saber Vice President St. Lucije Plant

DAS/msd

Attachment

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

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95							)104									
LICENSEE EVENT REPORT (LER) FORWARD COMMENTS REGARDING BURDEN ESTIMATE THIS INFORMATION COLLECTION REQUEST: 50.0 FORWARD COMMENTS REGARDING BURDEN ESTIMATE THE INFORMATION AND RECORDS MANAGEMENT BR (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISS								COMPLY WITH T: 50.0 HRS. ESTIMATE TO GEMENT BRANCH Y COMMISSION,								
(See	(See reverse for required number of digits/characters for each block) WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.															
FACILIT	Y NAME	(1)	St.	Lucie Unit	1		<u>.                                    </u>				DOCK	(ET	NUMBER (2) 05000335	5	L 1	PAGE (3) L OF 5
TITLE (4	IIILE (4) Automatic Reactor Trip on Loss of Electrical Load due to Flashover on 240 KV Switchyard Potential Transformer															
EVEN	T DATE	(5)		LER NUMBER (6)	>		REPO	RT D	ATE	(7)			OTHER FACIL	ITIES INV	OLVED	(8)
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISI	ion Er	MONTH	D/	١Y	YEAR	FACI		N/A		DOCKE	TNUMBER
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			20.	405(8)(1)(111)		<sup>:</sup>	50.73(8	)(2)	(1)				50.73(a)(2)(v	(111)(A)	(A) (Specify in	
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CAUSE	SYSTEM	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	NPONENT	MANUFACTURER	REPORTAL TO NPRI	BLE DS			CAU	SE	SYSTE	4	COMPONENT	MANUFACTU	RER	REPORTABLE TO NPRDS
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ABSTRACT	[ (Limi	it to 1	400 spac	es, i.e., approxi	imately	15 s	ingle-	spac	ed t	уренгі	itten	lin	es) (16)			
On Oc power switc 1 exp Main	tober . At hyarc erier Gener	26, 1426 1 nea nced cator	1994 util r the an au diff	, Unit 1 was ity personne Unit 1 syne tomatic read erential cu	s in 1 el ob: chron ctor rrent	mod ser izi tri cc	le 1 a ved a ng po p on p on ondit	and a f ote Lo ion	l oj la nt: ss	pera sh i ial of Stan	ting n th tran Elec darc	g a ne nsf ctr d p	at 100% st area of t former. At rical Load ost trip	ceady s the 240 this d predi action	state ) KV time LCate	e Unit ed by ere
safet the 2 the p	y fur 40 KV rotec	nctio / swi cted	ns we tchya area.	re satisfact rd at the at The fire wa	ffecto as co	su ed ntr	ibseq syncl colled	y p uen hrc d a	nt ni nd	y a zing all	fire pot owed	e w ten d t	as report itial trar o extingu	iced at isformed ish it	1449 97 01 25el:	5 in utside f.
The root cause of the failed potential transformer is attributed to an external fault to the transformer across its insulator. This fault was most likely induced by marginal component design insulation level and contributed to by salt contamination of the insulator.																
Corrective actions were: 1) Operations stabilized the unit in mode 3. 2) The affected potential transformer has been replaced. 3) Contamination preventive coatings are scheduled for both units synchronizing potential transformers 4) The unit 1 Main Transformers and Isophase bus have been tested. 5) The Main Generator was visually inspected with satisfactory results.																

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NRC FORM 366A U.S. NUCLEAR RE (5-92)	EGULATORY COMMISSION	APPROVED BY OHB NO. 3150-0104 EXPIRES 5/31/95						
NRC FORM 366A (5-92) LICENSEE EVENT REPORT (LI TEXT CONTINUATION	ESTIMAT THIS IN FORWARD THE IN (MNBB 7 WASHING REDUCTI MANAGEM	ED BURDEN PER IFORMATION COLLE COMMENTS REGA FORMATION AND F 714), U.S. NUCLI TON, DC 20555-0 ON PROJECT ( ENT AND BUDGET,	RESPONSE ECTION REQU RDING BURD RECORDS MAN EAR REGULAT 001, AND TI (3150-0104) WASHINGTON	TO COMPLY WITH JEST: 50.0 HRS, EN ESTIMATE TO VAGEMENT BRANCH ORY COMMISSION, O THE PAPERWORH OFFICE OF DC 20503.				
FACILITY NAME (1) DOCKET NUMBER (2) LER NUMBER (6) PAGE								
St. Lucie Unit 1	year 94	SEQUENTIAL NUMBER	REVISION NUMBER O	2 OF 5				
TEXT (If more space is required, use additional copies of DESCRETPTION OF THE EXTENT	f NRC Form 366A) (17	') ')		L <u>, I</u>				
On 26.October, 1994, Unit 1 was at 100% power steady state operations. At 1426, utility personnel observed an arc on the Unit 1 synchronizing potential transformer (EIIS:FK) located on the "A" phase 240 KV line from the Unit 1 Main Transformers (EIIS:EL) at switchyard bay 1. Unit 1 experienced an automatic reactor trip from the Reactor Protection System (EIIS:JC) on "Loss of Electrical Load" due to a Main Generator (EIIS:TB) lockout. Utility licensed operators conducted Emergency Operating Procedure (EOP)-1, "Standard Post Trip Actions" and diagnosed an uncomplicated reactor trip. Implementation of EOP-2, "Reactor Trip Recovery" confirmed an uncomplicated reactor trip and the plant was stabilized in Mode 3, Hot Standby.								
At the time of the event Unit 2 experienced spurious annunciator activity which immediately reset. In addition several radiation monitors spiked causing Shield Building Ventilation Fans HVE 6A & 6B (EIIS:VC) to start. No other significant actuations or abnormalities were observed.								
At 1445 a fire was reported outside the site protected area in the 240 KV switchyard. The synchronizing potential transformer for the "A" phase of the Unit 1 Main Transformer 240 KV line to the Switchyard 240 KV busses had faulted and was leaking oil which subsequently ignited. Upon investigation by the Nuclear Watch Engineer, it was determined that the fire was isolated to the potential transformer and its support column. At 1545 utility on-site fire fighting personnel were requested to respond as a precautionary measure. However, it was determined that since the fire was controlled with minimal potential to affect other switchyard components that it was best to let the oil burn off and not risk personnel or switchyard components by extinguishing it. At 1555, off-site fire fighters were called to assist in providing observation so that on-site fire personnel would not need to be stationed at the switchyard until the oil had burned out. At 2355 utility switchyard personnel notified the control room that the fire at the potential transformer was completely extinguished.								
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NRC FORM 366A U.S. NUCLEAR RE	U.S. NUCLEAR REGULATORY COMMISSION					APPROVED BY ONB NO. 3150-0104 EXPIRES 5/31/95						
LICENSEE EVENT REPORT (LE TEXT CONTINUATION	ESTIMAT THIS IN FORWARD THE IN (MNBB 7 WASHING REDUCTI MANAGEM	EXPIRE ED BURDEN PER IFORMATION COLLE COMMENTS REGA FORMATION AND R 714), U.S. NUCLE TON, DC 20555-0 ON PROJECT ( ENT AND BUDGET.	RESPONSE CTION REQ RDING BURI ECORDS MA AR REGULA DO1, AND 1 3150-0104 WASHINGTOD	TO COMI UEST: 5 DEN EST: NAGEMENT TORY COM TO THE P O, OFF N, DC 20	PLY D.O IMATE BR MISS APER ICE 503.	WITH HRS. E TO ANCH ION, WORK OF						
FACILITY NAME (1)	FACILITY NAME (1) DOCKET NUMBER (2)						>					
St. Lucie Unit 1	05000335	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 (	न्नत	5					
		94										
TEXT (If more space is required, use additional copies of NRC Form 366A) (17)												
CAUSE OF THE EVENT		,					İ					
The root cause of this event has been porcelain insulator of the synchronizi in a flashover of the insulator. Exami laboratory indicates the flashover res insulation level of the potential tran of the insulator.	determined to ing potential ination by the sulted from a nsformer conti	o be a trans e FPL combi ribute	an external sformer (PI Power Deli ination of ed to by sa	fault ) whic very to margin lt con	acro h res est al ba tamin	ss ult sic ati	the ed on					
The St. Lucie electrical distribution system utilizes one synchronizing potential transformer for each unit located on the "A" phase 240 KV tie line from the main transformers in the switchyard. They are used to synchronize the main generator to the offsite distribution system during unit startup. IEEE design standards for the original installation allowed two basic insulation levels (BIL), 900 KV and 1050 KV. The failed potential transformer was installed during original construction per vendor recommendation as a 900 KV BIL model. This was not considered to present a problem during past switchyard operability reviews since an FPL transmission database dating from 1982 had revealed no in-service failure of this model potential transformer in applications in the FPL distribution system. Due to past industry events a cleaning and coating program was initiated for insulated switchyard protective components. Though the potential transformers are routinely cleaned, they have not received the protective coating. The potential transformers are being added to the switchyard maintenance coating program.												

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U.S. NUCLEAR RE	U.S. NUCLEAR REGULATORY COMMISSION 5-92)									
LICENSEE EVENT REPORT (LE TEXT CONTINUATION	ESTIMATED BURDEN PER RESPONSE TO COMPLY WIT THIS INFORMATION COLLECTION REQUEST: 50.0 HRS FORWARD COMMENTS REGARDING BURDEN ESTIMATE T THE INFORMATION AND RECORDS MANAGEMENT BRANC (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON, DC 20555-0001, AND TO THE PAPERWOR REDUCTION PROJECT (3150-0104), OFFICE O MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.									
FACILITY NAME (1)	DOCKET NUMBER (2)		LER NUMBER (6)		PAGE (3)					
St. Lucie Unit 1	05000335	year 94	007		4 OF 5					
TEXT (1f more space is required, use additional copies of NRC Form 366A) (17)										
ANALYSIS OF EVENT:										
This event is reportable under the real that resulted in manual or automatic a	quirements of actuation of a	10CFI any Er	R50.73.a.2. Igineered S	iv as ' Safety H	'any even Teature.					
Examination of the Generator Continuous Monitoring System data indicated that the Main Generator protective circuitry functioned as designed and that the onsite electrical distribution parameters were maintained within electrical and mechanica limits with respect to the fault on the "A" phase of the Unit 1 240 KV electrical distribution. Offsite electrical power was not interrupted to either unit during this event. An inspection of the Unit 1 electrical generation system was performed in conjunction with that of the switchyard. The results of the electrical distribution inspection and testing revealed the only degraded or failed component resulting from this transient was the Unit 1 synchronizing potential transformer										
The potential transformer fault caused a differential current condition on the "A" phase of 240 KV from the Unit 1 Main Transformer resulting in a Main Generator Lockout as designed. The lockout generated a turbine trip causing an automatic reactor trip from the Reactor Protection System on "Main Turbine Generator Loss of Load". The function of this reactor trip is described in the St. Lucie design basi as an equipment protective trip which is not required for reactor safety. This event is bounded by section 15.2.7 of the St. Lucie Unit 1 Final Updated Safety Analysis Report (FUSAR) "Loss of External Electrical Load". The actual plant response was more conservative for several reasons.										
<ol> <li>The Reactor Protection System actuated on "Loss of Load" versus "High Pressurizer Pressure" thereby minimizing the Reactor Coolant System (EIIS:AB) temperature and pressure transient.</li> <li>The Steam Bypass Control System (EIIS:JI) did not initially "quick-open" as expected but did automatically "modulate" to restore the Reactor Coolant System to no load values.</li> <li>Auxiliary Feedwater (EIIS:BA) to the Steam Generators was not required as the 11 Main Feedwater Pump (EIIS:SJ) supplied adequate feedwater to both steam generators during the post trip recovery actions.</li> </ol>										
continued to provide offsite electrical power after the trip.										
CORRECTIVE ACTIONS.	C PUNTIC MELE	. 1106	arrected D	Y CHIS	Evenic.					
1) Operations personnel stabilized the	e plant in Mod	le 3, 1	Hot Standb	v.						
2) Utility Power Delivery personnel re synchronizing potential transformer wi strike distance for enhanced insulation	placed the fa th a new 900 g capability.	iled KV BI	Unit 1 "A" L rated mo	- phase del of	increased					
3) Utility Power Delivery department will coat the Unit 1 synchronizing potential transformer prior to placing the unit on-line.										

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NRC FORM 366A U.S. NUCLEAR RE	GULATORY COMMISSION		APPROVED BY O EXPIRE	MB NO. 3150 S 5/31/95	-0104	-		
LICENSEE EVENT REPORT (LE TEXT CONTINUATION	ESTIMAT THIS IN FORWARD THE IN (MNBB 7 WASHING REDUCTI MANAGEM	ED BURDEN PER IFORMATION COLLE COMMENTS REGAI FORMATION AND P 714), U.S. NUCLI ITON, DC 20555-0 ON PROJECT ( IENT AND BUDGET,	RESPONSE T ECTION REQU RDING BURDE ECORDS MAN EAR REGULAT 001, AND TO (3150-0104), WASHINGTON,	O COMPLY EST: 50.0 IN ESTIMAT AGEMENT B DRY COMMIS OTHE PAPE OFFICE DC 20503	WITH HRS. IE TO RANCH SION, RWORK OF			
FACILITY NAME (1)	DOCKET NUMBER (2)		LER NUMBER (6)	<u>&gt;</u>	PAGE (	3)		
St. Lucie Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION				
	05000335	94	007	0	5 OF	5		
TEXT (If more space is required, use additional copies of	NRC Form 366A) (17	<u>/</u> )						
CORRECTIVE ACTIONS (cont.)								
4) The new Unit 1 synchronizing potent Delivery department during the next re currently being manufactured and is s which has a 1050 KV basic insulation :	tial transfor efueling outag imilar to one level.	ner wi ge. Th recei	ill be repl nis replace ntly instal	laced by ment is lled on	Power Unit 2			
5) The utility Power Delivery department components and found no degraded components transformer.	ent has inspect onents other f	cted ( than t	<i>J</i> nit 1 swit che failed	chyard potenti	al			
6) The utility Power Delivery department has scheduled periodic application of silicone coatings of both unit synchronizing potential transformers.								
7) The utility Power Delivery department has performed tests of 1A and 1B Main Transformers and the Isophase buss with satisfactory results.								
8) An internal visual inspection has been performed of the Main Generator by utility Electrical Maintenance and the Generator Original Equipment Manufacturer with satisfactory results.								
9) The utility Electrical Maintenance department has cleaned and adjusted the undervoltage coil on the Steam Bypass Control System which was responsible for th failed "quick-open" signal.								
ADDITIONAL INFORMATION								
Failed Component Identification:								
"A" phase 240 KV synchronizing potential transformer Manufacturer: General Electric Type: EW-900 Catalogue/Serial No.: K549000 Rating: 1200/2000 to 120V								
Previous Similar Events: LER 335-94-005 describes an event which caused an automatic reactor trip due to a								
fault on the Unit 1 site electrical di	lstribution sy	/stem.		-				

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