

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8803140382 DOC.DATE: 88/03/08 NOTARIZED: NO DOCKET #  
 FACIL:50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251  
 AUTH.NAME AUTHOR AFFILIATION  
 HART,R.D. Florida Power & Light Co.  
 CONWAY,W.F. Florida Power & Light Co.  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-003-00:on 880207,Unit 4 shutdown when three battery  
 chargers became inoperable due to failure of gate filter.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

### NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD2-2 LA	1 1	PD2-2 PD	1 1
	EDISON,G	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	ARM/DCTS/DAB	1 1	DEDRO	1 1
	NRR/DEST/ADS7E4	1 0	NRR/DEST/CEB8H7	1 1
	NRR/DEST/ESB 8D	1 1	NRR/DEST/ICSB7A	1 1
	NRR/DEST/MEB9H3	1 1	NRR/DEST/MTB 9H	1 1
	NRR/DEST/PSB8D1	1 1	NRR/DEST/RSB 8E	1 1
	NRR/DEST/SGB 8D	1 1	NRR/DLPQ/HFB10D	1 1
	NRR/DLPQ/QAB10A	1 1	NRR/DOEA/EAB11E	1 1
	NRR/DREP/RAB10A	1 1	NRR/DREP/RPB10A	2 2
	NRR/DRIS/SIB9A1	1 1	NRR/PMAS/ILRB12	1 1
	REG FILE 02	1 1	RES TELFORD,J	1 1
	RES/DE/EIB	1 1	RES/DRPS DIR	1 1
	RGN2 FILE 01	1 1		
EXTERNAL:	EG&G GROH,M	5 5	FORD BLDG HOY,A	1 1
	H ST LOBBY WARD	1 1	LPDR	1 1
	NRC PDR	1 1	NSIC HARRIS,J	1 1
	NSIC MAYS,G	1 1		

TOTAL NUMBER OF COPIES REQUIRED: LTTR 46 ENCL 45



## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Turkey Point Unit 4</b>										DOCKET NUMBER (2) <b>0 5 0 0 0 2 5 1 1</b>										PAGE (3) <b>1 OF 0 4</b>							
TITLE (4) <b>Unit 4 Shutdown When Three Battery Chargers Became Inoperable Due to Failure of a Gate Filter Module</b>																											
EVENT DATE (5) MONTH DAY YEAR <b>0 2 0 7 8 8</b>						LER NUMBER (6) YEAR SEQUENTIAL NUMBER REVISION NUMBER <b>8 8 - 0 0 3 - 0 0 0</b>						REPORT DATE (7) MONTH DAY YEAR <b>0 3 0 8 8 8</b>						OTHER FACILITIES INVOLVED (8) FACILITY NAMES DOCKET NUMBER(S) <b>Turkey Point Unit 3 0 5 0 0 0 2 5 1 0</b>									
OPERATING MODE (9) <b>1</b>		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																									
POWER LEVEL (10) <b>1 1 0 0</b>		20.402(b)						20.406(c)						50.73(a)(2)(iv)						73.71(b)							
		20.406(a)(1)(i)						50.36(a)(1)						X 50.73(a)(2)(v)						73.71(c)							
		20.406(a)(1)(ii)						50.36(a)(2)						X 50.73(a)(2)(vi)						OTHER Specify in Abstract below and in Text, NRC Form 366A1							
		20.406(a)(1)(iii)						X 50.73(a)(2)(ii)						50.73(a)(2)(vii)(A)													
		20.406(a)(1)(iv)						50.73(a)(2)(iii)						50.73(a)(2)(vii)(B)													
		20.406(a)(1)(v)						50.73(a)(2)(iv)						50.73(a)(2)(viii)						50.73(a)(2)(ix)							
LICENSEE CONTACT FOR THIS LER (12)																											
NAME <b>Randall D. Hart, Licensing Engineer</b>										TELEPHONE NUMBER AREA CODE <b>3 0 5 2 4 6 - 1 6 5 5 1 9</b>																	
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																											
CAUSE	SYSTEM	COMPONENT	MANUF. TURER	REPORTABLE TO NPROS		CAUSE	SYSTEM	COMPONENT	MANUF. TURER	REPORTABLE TO NPROS																	
B	E J	C A P	E 3 5 3	Y																							
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR											
YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO <input type="checkbox"/>																											

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On February 7, 1988, a shutdown of Unit 4 from 100% power was commenced due to exceeding the requirements of the interim technical specification (ITS) for having the 4S battery charger out of service. The ITS are a set of conservative technical specifications (TS) developed for trial implementation at Turkey Point prior to converting our existing TS over to the standard technical specification format. The current licensed TS did not require a shutdown of Unit 4. However, Plant Management decided to follow the guidance of the ITS unless a technically justified reason not to follow the ITS could be supplied. Subsequent investigations on February 7, 1988 discovered that the other two similar battery chargers were experiencing the same failures. Based on this, Unit 4 was brought to cold shutdown until repairs could be made to the failed components. There were two contributing factors to the cause of this event. The first was an incorrect part selection for the gate filter module cards that was susceptible to failure when subjected to transients. The other was an improper method used to remove the battery chargers from service that induced transients that resulted in the failure of the incorrect part. The subject cards have been replaced with an improved model and the procedure for removing the battery chargers from service has been revised to conform with the manufacturer's recommendations.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Turkey Point Unit 4	0 5 0 0 0 2 5 1	8 8	0 0 3	0 0	0 2	OF	0 4

TEXT (If more space is required, use additional NRC Form 368A's) (17)

EVENT:

On February 6, 1988, at 1015, the 4S battery charger (E11S:EJ) was taken out of service for preventive maintenance. This placed Unit 4, which was at 100% power into a 24 hour action statement per interim technical specification (ITS) 3/4.8.2.1.a.2. The ITS are a trial set of technical specifications (TS) developed for trial implementation at Turkey Point prior to converting our existing TS over to the standard technical specification format. Since this event the ITS have been replaced at Turkey Point. Administrative procedure (AP) 0-ADM-021, Technical Specification Implementation Procedure, was approved on March 1, 1988 to provide guidance on the use and revision of the transition document used to familiarize plant personnel with the format and concept of standardized technical specifications. The current licensed TS would not have placed unit 4 into an action statement. At 1434, the 4S battery charger was loaded onto its respective DC bus, however, smoke was observed coming from the charger. The 4S battery charger was de-energized and still considered out of service. Efforts were continued to return the 4S battery charger to service.

The DC system at Turkey Point consists of 4 DC busses supplied by 4 safety related batteries and 6 battery chargers. The 3A and 4B DC busses are fed by the 3A, 4B, and 3S 400 amp battery chargers and the 4A and 3B DC busses are fed by the 4A, 3B, and 4S 300 amp battery chargers.

At 1115 on February 7, 1988, a shutdown of unit 4 was commenced due to exceeding the action statement for 4S battery charger per ITS 3/4.8.2.1.a.2. Discussions were commencing with our engineering department to determine the valid action statement requirements. At 1230, the load reduction was halted after a conference call with engineering and the plant which resulted in determining that the 24 hour action statement in the ITS was arbitrarily chosen and that 72 hours would have been a more appropriate action statement for the single battery charger. Also we met our licensed TS requirements of section 3.7 requiring 4 out of six battery chargers operable. An event response team (ERT) was formed to evaluate this problem. At 1410, the 4S battery charger was loaded on the 3B DC bus and upon de-energizing the 3B battery charger, it experienced a failure similar to the one experienced by the 4S battery charger. An inspection of the 4A battery charger was commenced and a failed circuit card similar to the ones failed in the 4S and 3B battery chargers was discovered. Based on this information, a Unit 4 load reduction was commenced at 1645. Unit 4 entered mode 3 (hot standby) at 1840. After further reviews by engineering, it was determined that the 3B, 4A, and 4S battery chargers could not be made operable within the time required to be in cold shutdown, so a cool down of unit 4 was commenced at 2328 on February 7, 1988 and entering mode 5 at 2310 on February 8, 1988.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

**CAUSE OF EVENT:**

An investigation of the loss of the battery chargers found that a snubber capacitor on the gate filter module card had failed due to a component selection error by the manufacturer combined with improper operation of the equipment.

A vendor wiring modification identified in plant change / modification (PC/M) 87-344, resulted in the change out of 18 gate filter module cards in the 3B, 4A, and 4S battery chargers. When these cards were replaced the original capacitor used for snubber circuit was discontinued by the manufacturer. The replacement capacitor selected met all published parameters of the original capacitor. As a result of these failures, it came to light that the capacitor selected was not recommended for snubber circuit applications. This meant that the capacitor might fail when subjected to transients.

The vendor technical manual did not provide explicit instructions for removing a battery charger from service. The plant procedures were written to open the output, or battery breaker, to isolate the battery charger, followed by opening the AC input breaker. This sequence of operation creates a large transient on the rectifier power circuit due to the sudden unloading of the battery charger. This could result in an immediate failure of the snubber capacitor or result in the capacitor failing at a latter date.

Therefore, the root cause of this event was an incorrect part selection for the snubber capacitor along with with improper switching operations to place the battery chargers in and out of service.

**ANALYSIS OF EVENT:**

During this event, Unit 3 was in mode 5 (cold shutdown) and Unit 4 was 100% power. The only battery chargers affected were the 3B, 4A, and 4S. The larger 400 amp battery chargers 3A, 4B, and 3S are not subject to the above concerns as they are of a different design which does not incorporate a "snubber capacitor". Even though the affected battery chargers were considered inoperable, they were still functional and were ensuring a power supply was in operation to their respective vital DC buss. In addition, the four safety related batteries were operable and capable of supplying power to their respective DC busses if a loss of offsite power were to have occurred. Based on the above, the health and safety of the public were not affected.

**CORRECTIVE ACTIONS:**

- 1) The snubber capacitors on the affected gate filter module cards were replaced with an improved module less susceptible to the failures identified in this report. This was accomplished under PC/M 88-050.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

- 2) Operating procedure (OP) 0-OP-003.1, 125V Vital DC System, was revised with an on the spot change (OTSC) on February 7, 1988, to modify the process of removing a battery charger from service. The new instructions require the battery charger AC input breaker to be opened first to shut off the charger and then open the DC output breaker to disconnect the battery charger from the DC buss. This change was permanently incorporated into the procedure on February 9, 1988.
- 3) Electrical Maintenance Surveillance procedure (SME) 0-SME-003.5, 125VDC Station Battery Charger Annual Maintenance, will be revised to include the revised method for removing a battery charger in and out of service.
- 4) An ERT was formed to evaluate this event to assist in determining root cause and proposing corrective actions.
- 5) Engineering has been requested to evaluate this condition to determine if it constitutes a substantial safety hazard.

**ADDITIONAL DETAILS:**

The battery chargers affected are model UPC-130-3-300 manufactured by Exide Electronics.

Similar Occurrences: None



MARCH 8 1988

L-88-113  
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Unit 4  
Docket No. 50-251  
Reportable Event: 88-03  
Date of Event: February 7, 1988  
Unit 4 Shutdown When Three Battery Chargers Became  
Inoperable Due to Failure of a Gate Filter Module

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

Very truly yours,

A handwritten signature in cursive script, appearing to read "W. F. Conway", is written over the typed name.

W. F. Conway  
Acting Group Vice President  
Nuclear Energy

WFC/SDF/gp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator,  
Region II, USNRC  
Senior Resident Inspector, USNRC, Turkey Point Plant

SDF4/003.LER

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