

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8706250132 DOC. DATE: 97/06/19 NOTARIZED: NO DOCKET #  
 FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250  
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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-015-00: on 870522, design basis reconstitution revealed potential loss of HVAC in inverter & battery rooms. Caused by mods to original plant design. Maint & insp procedures implemented for air conditioning units. W/870619 ltr.

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

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	NRR/PMAS/PTSB	1 1	<u>REG FILE</u> 02	1 1
	RES DEPY GI	1 1	RGN2 FILE 01	1 1
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
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## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Turkey Point Unit 3</b>										DOCKET NUMBER (2) <b>0 5 0 0 0 2 5 0</b>					PAGE (3) <b>1 OF 0 4</b>	
TITLE (4) <b>Design Basis Reconstitution Discovers Potential Loss of HVAC in the Inverter and Battery Rooms</b>																
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)						
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES				DOCKET NUMBER(S)			
0 5	2 2	8 7	8 7	0 1 5	0 0	0 6	1 9	8 7	<b>Turkey Point Unit 4</b>				<b>0 5 0 0 0 2 5 1</b>			
									<b>N/A</b>				<b>0 5 0 0 0 . . .</b>			
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)														
6		20.402(b)				20.406(c)				50.73(a)(2)(iv)				73.71(b)		
POWER LEVEL (10)		20.406(a)(1)(i)				50.38(e)(1)				<input checked="" type="checkbox"/> 50.73(a)(2)(v)				73.71(e)		
0 0 0		20.406(a)(1)(ii)				50.38(e)(2)				<input checked="" type="checkbox"/> 50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
		20.406(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(vii)(A)						
		20.406(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)						
		20.406(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME <b>Gabe Salamon, Compliance Engineer</b>										TELEPHONE NUMBER						
										AREA CODE		3 0 5 2 4 6 . 6 5 6 0				
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC						
SUPPLEMENTAL REPORT EXPECTED (14)											EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)											<input checked="" type="checkbox"/> NO					
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																
<p>On May 22, 1987, with Unit 3 in mode 6 and Unit 4 in mode 5, it was determined that subsequent to a loss of offsite power (LOOP), a single failure could result in a loss of HVAC to the DC equipment/inverter rooms. Other scenarios which could result in the loss of HVAC to certain rooms were also identified. The loss of HVAC could result in elevated temperatures of the affected rooms. Short term operation of the safety related electrical equipment in these areas at temperatures up to 135 degrees F would not result in a loss of safety function. The initial design was exacerbated in the current design due to modifications which added to the room heat loads, and the addition of walls and doors limiting air flow, to satisfy Appendix R requirements. Periodic inspections for the A/C units will be implemented. As an interim measure to improve the air flow distribution, two doors will be blocked open. Room temperatures will be checked hourly. If temperatures in the affected areas reach 100 degrees F, supplemental cooling will be initiated. This will consist of the temporary use of portable fans until normal cooling can be restored. A Plant Change/Modification (PC/M) installing additional vital electrical outlets and seismic storage racks for the portable fans has been implemented. Long term enhancements to the HVAC system are under evaluation.</p>																
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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Turkey Point Unit 3	0 5 0 0 0 2 5 0	8 7	0 1 5	0 0	0 2	OF	0 4

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

EVENT

On May 22, 1987, while Unit 3 was in mode 6 (Refueling) and Unit 4 was in mode 5 (cold shutdown), it was determined that subsequent to a loss of offsite power, a single failure could result in a complete loss of HVAC to the DC equipment/inverter rooms. This, in turn, could result in elevated temperatures of the safety related equipment in the above rooms. The equipment includes the 125V DC batteries, battery chargers, inverters, constant voltage transformers, DC Motor Control Centers (MCC), and transfer switches. Three non-safety related air conditioning (A/C) units currently supply conditioned air to the DC equipment/inverter rooms. The HVAC system for these rooms consists of a split A/C unit that can be powered from the emergency diesel generators (EDG's), and two self contained A/C units that cannot be powered from the EDG's. An engineering evaluation identified the following scenarios which could result in a loss of HVAC, with a consequent temperature increase over time in the affected areas:

- 1) In the event of a loss of offsite power, (LOOP), only the EDG-backed A/C unit would be available to provide cooling. A single active failure would result in a loss of A/C to all of the DC equipment/inverter rooms.
- 2) During normal plant operation, loss of the north A/C unit would result in a loss of HVAC to the rooms served by the north unit.
- 3) A fire in fire zone 58 could result in the loss of HVAC to the rooms served by the south unit.

The engineering evaluation determined that two cases bound the above scenarios, namely normal and LOOP operations. During these events, the maximum room temperatures which could be reached under worst case conditions would be 172 degrees F. Short term operation of the safety related electrical equipment in these areas at temperatures up to 135 degrees F would not result in a loss of safety function. Corrective action which will preclude temperatures from exceeding 135 degrees F during the above scenarios has been taken.

CAUSE OF EVENT

During the Design Basis Reconstitution of the loss of HVAC scenario, no documented analysis of the effects of the loss of HVAC in the DC equipment/inverter rooms was identified. The Turkey Point Units 3 and 4 FSAR does not specifically address the design basis for the DC equipment/inverter room HVAC system. As implied by its absence from the FSAR, it can be assumed that the original plant design did not consider this HVAC system as a support system required for operation of the safety related



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Turkey Point Unit 3	0 5 0 0 0 2 5 0	8 7	0 1 5	0 0	0 3	OF	0 4

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

equipment in the above rooms. The above engineering evaluation established that the maximum room temperatures which the rooms as initially built could reach were 123 degrees F for Unit 3 and 148 degrees F for Unit 4. The initial design was exacerbated in the current design due to the addition of the Constant Voltage Transformers which added to the room heat loads, and the addition of the fire rated walls and doors to satisfy 10CFR50 Appendix R requirements. It is apparent, based on the results of the engineering evaluation, that these changes in the original plant design had an impact on the maximum room temperatures.

ANALYSIS OF EVENT

This condition was discovered when Unit 3 was in a refueling outage and Unit 4 was in an extended maintenance outage. Compensatory measures will be in place prior to either unit entering Mode 4.

The "as-found" condition was evaluated with the following conclusions:

- 1) For the current design, during normal operation, there would have been many hours available to detect a loss of HVAC and take appropriate actions prior to reaching 135 degrees.
- 2) The loss of HVAC during normal operation does not cause the operator to alter the units' status based on erroneous information.
- 3) In the case of a Loss of Coolant Accident (LOCA) coincident with a LOOP, any failures of equipment would occur well into the accident, when radiation fields and the post-LOCA excitement would have abated. Time would be available for corrective action.
- 4) Subsequent to a LOOP, it is likely that offsite power will be quickly restored and that the north and south A/C units would be returned to service. This would curtail the temperature excursion. Previous evaluations have determined that the mean time to restore power to FPL facilities is less than 30 minutes.
- 5) The worst case fire scenario is a fire in fire zone 58. Under the limiting case, temperatures would reach 135 degrees in about 4.5 hours. As this zone has detectors, the operators would be quickly alerted to take immediate corrective actions.

Based on the above, the health and safety of the public were not affected.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Turkey Point Unit 3	0 5 0 0 0 2 5 0	8 7	0 1 5	0 0	0 4	OF 0 4

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

CORRECTIVE ACTIONS

- 1) The following short term HVAC enhancements will be initiated prior to either unit entering Mode 4:
  - a) In order to increase reliability and performance, a maintenance and periodic inspection procedure for each of the three A/C units will be implemented.
  - b) As an interim measure to improve the flow distribution of the EDG-backed A/C unit, the fire doors between rooms 108A and 108B, and rooms 101 and 104 will be blocked open. A fire watch in accordance with Technical Specification (TS) 3.14.5b will be established.
  - c) In order to ensure proper HVAC operation in the affected areas during normal operation, procedures which will assure that the room temperatures are checked at one hour intervals will be implemented.
  - d) In the event the temperature in the area of the safety related equipment reaches 100 degrees F, supplemental cooling will be initiated. The supplemental cooling will consist of the temporary use of portable fans in the event of a loss or a reduction in the cooling to these rooms, until normal cooling can be restored. A Plant Change/Modification (PC/M) installing additional vital electrical outlets and seismic storage racks for the portable fans has been implemented.
  - e) Additional plant procedures which will govern the use of the portable fans and provide for the weekly testing of transfer switch DP-412A will be implemented. Transfer switch DP-412A functions to transfer the fan's power source to the energized bus.
- 2) Long term enhancements to the HVAC system are under evaluation.
- 3) The concern regarding the adequacy of safety evaluations was recognized by FPL in early 1986. As a result, FPL instituted a standard Engineering Package (EP) for PC/M's. Each EP utilizes a detailed checklist for safety evaluations associated with the EP, including a requirement to evaluate the impact of the modifications on the affected HVAC system. The requirement to use the EP process for plant PC/M's should preclude this problem from recurrence. The PC/M's associated with the previous room modifications were released prior to the implementation of the EP process at Turkey Point.

ADDITIONAL DETAILS

Similar occurrences: None







- JUNE 19 1987

L-87-259  
10 CFR 50.73

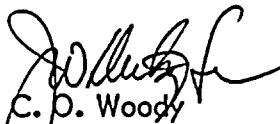
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Attn: Document Control Desk  
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Gentlemen:

Re: Turkey Point Unit 3  
Docket No. 50-250  
Reportable Event: 87-15  
Date of Event: May 22, 1987  
Design Basis Reconstitution Discovers Potential  
Loss of HVAC in the Inverter and Battery Rooms

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,

  
C. O. Woody  
Group Vice President  
Nuclear Energy

COW/SDF/gp

Attachment

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

IE22  
11

