

## ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9112300269 DOC.DATE: 91/12/19 NOTARIZED: NO DOCKET #  
 FACIL:50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250  
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 POWELL,D.R. Florida Power & Light Co.  
 PLUNKETT,T.F. Florida Power & Light Co.  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-012-00:on 911007,delta-T factor in overpower Delta-T  
 & overtemp Delta-T found set at design value of 56.1 F  
 instead of TS value.Caused by procedure error.Values changed  
 & plant procedures developed.W/911219 ltr.

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	REG FILE 02	1 1	RES/DSIR/EIB	1 1
	RGN2 FILE 01	1 1		
EXTERNAL:	EG&G BRYCE,J.H	3 3	L ST LOBBY WARD	1 1
	NRC PDR	1 1	NSIC MURPHY,G.A	1 1
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DEC 19 1991

L-91-324  
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Units 3 and 4  
Docket No. 50-250  
Reportable Event: 91-012-00  
Use of Design  $\Delta T$  Rather Than Indicated  $\Delta T$  for  $\Delta T_o$   
in OPAT and OTAT Setpoints as Required by Technical  
Specifications for Units 3 and 4.

The attached Licensee Event Report 250-91-012-00 is being provided in accordance with 10 CFR 50.73 (a) (2) (i) (B).

The event was determined to be reportable during a detailed review of a safety evaluation to be submitted to the Plant Nuclear Safety Committee on November 29, 1991.

If there are any questions please contact us.

Very truly yours,

T. F. Plunkett  
Vice President  
Turkey Point Nuclear

TFP/JEK/jk.

enclosures

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

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# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <div style="text-align: center;">TURKEY POINT UNITS 3 AND 4</div>										DOCKET NUMBER (2) <div style="text-align: center;">05000250</div>		PAGE (3) <div style="text-align: center;">1 OF 4</div>		
TITLE (4) <div style="text-align: center;">Use of Design Delta-Temperature (Delta-T) Rather Than Indicated Delta-T for Delta-T<sub>o</sub> in Overpower Delta-T and Overtemperature Delta-T Setpoints as Required by Technical Specifications for Units 3 and 4.</div>														
EVENT DATE (5)			LER NUMBER(6)			RPT DATE (7)			OTHER FACILITIES INV. (8)					
MON	DAY	YR	YR	SEQ #	R#	MON	DAY	YR	FACILITY NAMES			DOCKET # (5)		
10	07	91	91	012	00	12	19	91	TURKEY POINT UNIT 4			05000251		
OPERATING MODE (9)		1/5		10 CFR 50.73(a)(2)(i)(B)										
POWER LEVEL (10)		50/0												
LICENSEE CONTACT FOR THIS LER (12)														
David R. Powell, Licensing Manager										TELEPHONE NUMBER				
										305-246-6559				
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)														
CAUSE	SYSTEM	COMPONENT	MANUFACTURER			NPRDS?	CAUSE	SYSTEM	COMPONENT	MANUFACTURER			NPRDS?	
SUPPLEMENTAL REPORT EXPECTED (14) NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
(If yes, complete EXPECTED SUBMISSION DATE)														
ABSTRACT (16)														
<p>On October 7, 1991, with Unit 3 at 50% of rated power, during calibration of a new digital instrumentation rack, the Delta-T<sub>o</sub> factor in Overpower Delta-T and Overtemperature Delta-T setpoint formula was found to be set at the design value (56.1° F) instead of the indicated value as required by Technical Specifications. A safety evaluation was performed to assess the effect of the higher Delta-T<sub>o</sub> factor. The evaluation concluded that the plant had been operating within its design bases during all past cycles. Indicated Delta-T values at rated thermal power were obtained following calibration and inserted for the Delta-T<sub>o</sub> factor in OP Delta-T and OT Delta-T setpoint formula.</p> <p>The event was determined to be reportable, in accordance with 10 CFR 50.73 (a)(2)(i)(B), during a detailed review of a safety evaluation which was submitted to the Plant Nuclear Safety Committee for review on November 29, 1991.</p>														

# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME TURKEY POINT UNIT 3	DOCKET NUMBER 05000250	LER NUMBER 91-012-00	PAGE NO. 02 OF 04
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## I. EVENT DESCRIPTION

On October 7, 1991, during calibration of the Eagle-21 system (digital instrumentation rack) (EIIIS-IG) (IEEE-CHA) at 50% reactor power for Turkey Point Unit 3, the  $\Delta T_o$  value used in the Overtemperature Delta-T (OTAT) and Overpower Delta-T (OPAT) setpoints was found to be 56.1° F (design  $\Delta T$ ,  $T_{Hot} - T_{Cold}$ , at rated thermal power). Technical Specification 2.2.1 requires that indicated values of  $\Delta T$  at rated thermal power be used for  $\Delta T_o$ . A review of operational history at Turkey Point Units 3 and 4 prior to the resistance temperature detector (RTD) bypass elimination modification revealed that indicated  $\Delta T$  at rated thermal power had been as low as 53.8° F. This review also revealed that the design value of 56.1° F had been used for all past cycles for both Unit 3 and Unit 4. At present, following the RTD bypass elimination modification this past summer, the indicated values of  $\Delta T$  at rated thermal power are:

	Loop $\Delta T_o$		
	<u>A</u>	<u>B</u>	<u>C</u>
Unit 3	51.87	51.98	52.38
Unit 4	52.52	53.22	52.73

At power levels less than 75% of rated thermal power, during startup testing, the power range high flux reactor trip setpoint is adjusted down and will trip the reactor prior to OPAT and OTAT taking effect and tripping the plant. In addition, other reactor trip inputs exist that will trip the reactor upon receiving a valid signal.

During a subsequent evaluation of the  $\Delta T_o$  issue the determination was made that the setpoints for OPAT and OTAT had been non-conservative and therefore should have required the entry into an Action Statement in accordance with Technical Specification 2.2.1 b.

The event was determined to be reportable following a detailed review of a safety evaluation which was submitted to the Plant Nuclear Safety Committee on November 29, 1991 for final management approval. The event is considered to be reportable in accordance with 10 CFR 50.73 (a) (2) (i) (B), "Any operation or condition prohibited by the plant's Technical Specifications."

## II. EVENT CAUSE

The cause of this event was a procedure error. The calibration procedure installing  $\Delta T_o$  value in the OPAT and OTAT setpoints used 56.1° F until the setpoint methodology and the validity of the adjustable values in the new Eagle 21 digital instrumentation racks was reviewed and the error recognized. Subsequently a safety evaluation determined that the  $\Delta T_o$  within the OPAT and OTAT equations, used to define the setpoints, was non-conservative. Surveillance procedures, although adequate in the identification of correct setpoints, did not verify the correctness of constants in the OPAT and OTAT setpoints.



# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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## III. EVENT SAFETY ANALYSIS

The OPAT and OTAT setpoints are designed to provide protection against departure from nucleate boiling (DNB) and linear power density limits in the case of relevant transients, i.e., uncontrolled rod withdrawal, uncontrolled bank withdrawal, core cooldown, boron dilution and loss of load events. A detailed safety analysis was performed by Florida Power and Light based upon work performed by Westinghouse to assess the safety significance of the use of the  $\Delta T$  design value of 56.1 F° as  $\Delta T_0$  in the reactor protection setpoints for OPAT and OTAT.

The transients that comprise the Turkey Point licensing basis and require a  $\Delta T$  reactor trip for accident mitigation are the Uncontrolled Rod Cluster Control Assembly (RCCA) Withdrawal at Power (FSAR 14.1.2), Chemical and Volume Control Malfunction (Boron Dilution, (FSAR 14.1.5), and Loss of External Electrical Load (FSAR 14.1.10) events. These safety analyses use design  $\Delta T$  for  $\Delta T_0$ . The design  $\Delta T$  was used to start operation since the actual indicated  $\Delta T$  can not be determined until either operation has occurred at rated thermal power or a best fit curve of  $\Delta T$ s at lower power levels can be extrapolated to estimate indicated  $\Delta T$  at rated thermal power.

At power levels less than 75% rated thermal power, while calibration was in progress, the power range high flux reactor trip setpoint was lowered and would have tripped the reactor prior to OPAT and OTAT taking effect and tripping the plant. Other reactor trip inputs exist that will trip the reactor upon receiving a valid trip signal. If these trips do not occur, the effect of having the design  $\Delta T$  for  $\Delta T_0$  rather than the indicated  $\Delta T$  required by Technical Specifications is the same as increasing the trip setpoint, or more correctly increasing the time to a reactor trip. Analysis has shown that even if a delayed reactor trip would have occurred, the plant would have remained within its design.

The OTAT trip provides core protection for DNB for all combinations of pressure, power, coolant temperature and axial power distribution provided the transient is slow with respect to coolant transit delays from the core to the temperature detectors and pressure is within the range between the pressurizer high and low pressure trip setpoints.

The OPAT trip setpoint is automatically varied with (1) coolant temperature, and (2) rate of change of temperature. For instance, the faster the temperature changes in the upward direction the lower the trip setpoint.

Based upon the benefit from the increased actual core flow and the available margin in the setpoints, the design basis is met with the  $\Delta T_0$  factor set to the design value of 56.1° F.

## IV. CORRECTIVE ACTIONS

1. The  $\Delta T_0$  values for Units 3 and 4 have been changed to indicated  $\Delta T$  values at rated thermal power. This process was completed using installation and startup procedures which meet the surveillance requirements of the Technical Specifications.



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2. Plant procedures have been developed to calculate and implement indicated  $\Delta T$  values at rated thermal power for  $\Delta T$ , during power ascension and periodic calibration. Most values for constants used in the Eagle 21 system are obtained from vendor design documentation for the system. However,  $\Delta T$  for  $\Delta T$ , and the G factor (scaling factor ex-core to in-core) were obtained by measurement of the appropriate parameters and supplied by memo for inclusion into the Eagle 21 system. Formalization of the source of correct tuning constants will be complete by April 30, 1992.

## V. ADDITIONAL INFORMATION

None.



