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REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8901110410 DOC. DATE: 89/01/03 NOTARIZED: NO DOCKET #
 FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250
 AUTH. NAME AUTHOR AFFILIATION
 GROSS, K.W. Florida Power & Light Co.
 CONWAY, W.F. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-030-00: on 881202, instrument loop error & installation error caused ALI inability to assure Tech Spec limits met.
 W/8 ltr.

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 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Turkey Point Unit 3	DOCKET NUMBER (2) 0 5 0 0 0 2 5 0	PAGE (3) 1 OF 0 4
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TITLE (4) **Instrument Loop Error and Installation Error Caused Accumulator Level Instrumentation Inability to Assure Technical Specification Limits Met**

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		
									Turkey Point Unit 4		
1	2	0 2	8	8	0 3 0				0 5 0 0 0 2 5 1		

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 0 0	20.402(b)	20.406(e)	50.73(a)(2)(iv)	73.71(b)						
	20.406(a)(1)(i)	50.38(c)(1)	50.73(a)(2)(v)	73.71(c)						
	20.406(a)(1)(ii)	50.38(c)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	20.406(a)(1)(iii)	<input checked="" type="checkbox"/> 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 Karl W. Gross, Compliance Engineer	TELEPHONE NUMBER
	AREA CODE: 3 0 5 NUMBER: 2 4 6 - 6 7 4 9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
B	B P	L T	R 3 6 9	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On December 2, 1988, it was determined that the Unit 3 Safety Injection Accumulator Level Technical Specification (TS) limits may have been exceeded during operation. TS 3.4.1.3 requires "Each accumulator shall ... contain 875 - 891 cubic feet of water...." An analysis indicated that the basis used to scale the accumulator level indication transmitters was incorrect. An installation error also contributed to the level transmitter errors. Based on Unit 3 data, the errors ranged from a potential for an error of 0.41 inches (2.5 cubic feet) more than the maximum allowed volume, to an error of 0.30 inches (1.8 cubic feet) less than the minimum allowed volume. While it cannot be positively determined that the TS limits were exceeded, it was possible to operate outside these limits without alarm or other indication. The root causes of this condition were the two errors in the design which installed the transmitters in 1982, as well as installation errors in that some transmitters were not installed in accordance with the 1982 design package. Unit 4 conditions are believed similar to those found in Unit 3, and are being investigated. The transmitters are being replaced with a narrower span model to improve instrument accuracy. Calculations are being performed to verify the loop errors and ability of the system to assure compliance with TS. The installation error is being corrected through an improved mounting method.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Event Description

On December 2, 1988, the Turkey Point onsite engineering organization determined that the Unit 3 Safety Injection Accumulator Level (EIIS system code BP, component code TK) Technical Specification limits could have been exceeded during operation without alarm or indication.

The Turkey Point Technical Specification 3.4.1.3 requires, "Each accumulator shall be pressurized to at least 600 psig and contain 875 - 891 cubic feet of water with a boron concentration of at least 1950 ppm, and shall be isolated." The 875 - 891 cubic feet of water corresponds to limits of 6544 - 6664 gallons in each accumulator.

An engineering analysis indicated that the basis used to scale the accumulator level indication transmitters was incorrect. The narrow Technical Specification band (120 gallons) exacerbated this, since minor variations could cause a Technical Specification limit to be exceeded.

Based on Unit 3 data, the worst case total error with regard to maximum Technical Specification required volume, occurred on transmitter 3-LT-926 where an error of 0.41 inches level could correspond to 18.5 gallons more than the allowable volume of 6664 gallons.

Similarly, the worst case total error with regard to minimum Technical Specification required volume occurred on transmitters 3-LT-920 and 3-LT-924, where an error of 0.30 inches level could correspond to 13.5 gallons less than the allowable volume of 6544 gallons.

Due to the nature of the errors, it cannot be positively determined that the Technical Specification limits were exceeded. However, it was possible to receive a high or low level alarm that may have corresponded to an actual accumulator level outside the allowable Technical Specification operating band. Therefore, it was possible to operate outside the Technical Specification limits without alarm or other indication. The significance of operating in this condition is discussed in the Analysis of Event section of this LER.

An investigation into the cause for the condition indicated that the transmitters were installed in 1982 as plant modifications to address Regulatory Guide 1.97, and replaced the existing accumulator level transmitters. The new transmitters were specified and installed to address the need for indication of tank discharge, through use of a wide range level transmitter. During this modification, the need to maintain the water level in the accumulators within the narrow band required by the Technical Specifications was identified. An alternate method of verifying accumulator discharge was devised (i.e. accumulator tank pressure,) and the new transmitter spans were adjusted to monitor the required narrow range.

The calculations performed in support of the 1982 modification erroneously assumed a loop error from the original design. Also, the span calculation for the 1982 modification contained a mathematical error.

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

Recently, the installed configuration was examined, and some transmitters were not installed in accordance with the 1982 design. The transmitter height relative to the tap from the accumulator varied by as much as an inch from the design.

These three errors, improperly assumed instrument loop error; mathematical error in span calculation; and the improper installation elevation, contributed to the instrument inaccuracies.

The conditions and potential inaccuracies applicable to Unit 4 are under investigation and if not bounded by the conditions discovered in Unit 3, a supplemental LER will be submitted.

Root Cause

The root causes of this condition were the two errors in the design which installed the transmitters in 1982, as well as installation errors in that some transmitters were not installed in accordance with the 1982 design package.

Analysis of Event

The condition described was analyzed with assistance from Westinghouse, and the analysis demonstrated that the results and conclusions of the LOCA related accident analyses used to license the current operation of Turkey Point Unit 3 would have remained acceptable even with operation outside of the Technical Specification limits on accumulator volume.

The Westinghouse safety evaluation examined the affect of the accumulator water level deviations identified above. The results of the safety evaluation are summarized below:

Large and Small Break LOCA - No adverse effects on the FSAR peak cladding temperature calculation, maximum cladding oxidation or maximum hydrogen generation. Compliance with 10 CFR 50.46b (1-3) is maintained.

Hydraulic Forcing Function - No adverse effect on the Vessel and Loop LOCA hydraulic forcing functions.

Post-LOCA Longterm Core Cooling - The affect on the post-LOCA sump boron concentration is insignificant. Compliance with 10CFR50.46b(5) is maintained.

Hot Leg Switchover to Prevent Potential Boron Precipitation - Post-LOCA hot leg switchover time remains bounding.

Steam Generator Tube Rupture - Compliance with 10 CFR 100.11 offsite radiation dose limits are maintained.

Based on the above results, this condition had no adverse effect on the health and safety of the public.

The Unit 4 deficiencies are under investigation and if not bounded by the Unit 3 analysis, a supplemental LER will be submitted.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

Corrective Actions

- 1) The conditions which existed in Unit 4 are being investigated to determine the instrument inaccuracies which may have existed, and determine the safety significance of the condition. The results of the investigation will be reported in a supplement to this LER if the results are not bounded by those identified in this LER.
- 2) The transmitters installed in 1982 are being replaced with units with a narrower span. This will improve the instrument accuracy, and assure margin between alarm setpoints and Technical Specification limits. The replacement transmitters are being mounted using an improved method. Calculations in support of the replacement transmitter installation include correction of the mathematical error in the original span calculation. They also contain loop and component specific calculation of the instrument loop inaccuracy. The unit 3 transmitters have been replaced, and the unit 4 transmitters will be replaced prior to restart following the current refueling outage.
- 3) Similar process instrument loops which were modified to meet Reg. Guide 1.97 requirements will be reviewed for technical adequacy. This work is forecast to be completed prior to April 1, 1989. The need for additional corrective actions will be evaluated following completion of these reviews.
- 4) In 1986 a standard engineering design procedure was developed to control the manner in which plant modifications are written and implemented through the use of a Standard Engineering Design Package. Procedural guidance provides direction for design considerations including instrumentation and controls requirements (e.g. type of instrument, range of measurement, accuracy, and location of instrument). Engineering procedures require the performance and issuance of calculations in support of design modifications. Where appropriate, instrument setpoint and loop error calculations are performed to adequately support the modifications. In addition, a calculation standard format procedure was approved and implemented in 1986. These procedures provide formalized methods which assure verification, checking, and approval of design, including calculations. By standardizing the format, content, review process, and approval mechanisms for both plant modifications and calculations, the potential for design changes to have adverse effects has been reduced.

Other Information

The accumulators were supplied by Westinghouse as a part of the NSSS, and the instrument level transmitters installed in 1982 were supplied by Rosemount Instrument Corp., Model Number 1153DD4. The replacement transmitters are also supplied by Rosemount, Model Number 1153DD3.

A similar event was reported in LER 251-88-001.



FPL

P.O. Box 14000, Juno Beach, FL 33408-0420

JANUARY 3 1989

L-88-545
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 Nos. 50-250 and 50-251
Reportable Event: 250-88-30
Date of Event: December 2, 1988
Instrument Loop Error and Installation Error
Caused Accumulator Level Instrumentation
Inability to Assure Technical Specification Limits Met

The attached License 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,


W. F. Conway
Senior Vice President - Nuclear

WFC/RHF/gp

Attachment

cc: Malcolm L. Ernst, Acting Regional Administrator, Region II,
USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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