REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8707230183 DOC. DATE: 87/07/16 NOTARIZED: NO DOCKET #
FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250
AUTH. NAME AUTHOR AFFILIATION
HART, R. D. Florida Power & Light Co.
WOODY, C. O. Florida Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-020-00: on 861211, component cooling water HXs for unit operated outside temp limitations for approx 17 h. Continuous tube cleaning capability will be installed & similar mods planned for Unit 4. W/870716 ltr.

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	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD2-2 LA	1	1	PD2-2 PD	1	1
	McDONALD, D	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
	DEDRO	1	1	NRR/DEST/ADE	1	0
	NRR/DEST/ADS	1	0	NRR/DEST/CEB	1	1
	NRR/DEST/ELB	1	1	NRR/DEST/ICSB	1	1
	NRR/DEST/MEB	1	1	NRR/DEST/MTB	1	1
	NRR/DEST/PSB	1	1	NRR/DEST/RSB	1	1
	NRR/DEST/SGB	1	1	NRR/DLPQ/HFB	1	1
	NRR/DLPQ/QAB	1	1	NRR/DOEA/EAB	1	1
	NRR/DREP/RAB	1	1	NRR/DREP/RPB	2	2
	NRR/PMAS/ILRB	1	1	NRR/PMAS/PTSB	1	1
	REG FILE 02	1	1	RES DEPY GI	1	1
	RES TELFORD, J	1	1	RES/DE/EIB	1	1
	RGN2 FILE 01	1	1			
EXTERNAL:	EG&G GROH, M	5	5	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 45 ENCL 43

NRC Form 366
(9 83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Turkey Point Unit 3	0 5 0 0 0 2 5 0	1 OF 0 4

TITLE (4) Intake Cooling Water Temperatures Exceeded Limits Based on Engineering Evaluation for Component Cooling Water Heat Exchangers

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)
1 2	1 1	8 6	8 7	0 2 0	0 0	0 7	1 6	8 7	Turkey Point Unit 4	0 5 0 0 0 2 5 1
										0 5 0 0 0

OPERATING MODE (9)	6	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	X 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Randall D. Hart, Licensing Engineer	3 0 5 2 4 6 - 6 5 5 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	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		1 2	3 1	8 7

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

On June 16, 1987, a review of component cooling water (CCW) heat exchanger performance test data from December, 1986 revealed that Unit 3 had operated outside of a Engineering evaluation for the CCW heat exchangers for approximately 17 hours on December 11, 1986. In February of 1986, FPL Engineering notified Turkey Point of a potential concern on the ability of the intake cooling water (ICW) system to meet flow requirements for a design basis accident. Engineering continued to review this concern and developed an evaluation of this condition for Units 3 and 4. The evaluation provided guidance to the plant to develop a program to routinely evaluate the CCW heat exchanger performance. On December 1, 1986, performance tests were performed on the 3A, 3B, and 3C CCW heat exchangers. The preliminary analysis of the data from these tests indicated that the level of cleanliness of the CCW heat exchangers after cleaning was not as expected. After additional review of the data it was determined on June 16, 1987 that during the cleaning of the 3B CCW heat exchanger on December 11, 1986 the requirements of the evaluation were exceeded. A continuous tube cleaning system is being installed on Unit 3 during the current refueling outage. Similar modifications will be done on Unit 4 during the next refueling outage.

8707230183 870716
PDR ADOCK 05000250
S PDR

NRC Form
(9 83)

IE22
1/1

EVENT:

On June 16, 1987, a review of component cooling water (CCW) heat exchanger performance test data from December, 1986 revealed that Unit 3 had operated outside of the temperature limitations placed on the intake cooling water system provided by an Engineering evaluation for the CCW heat exchangers for approximately 17 hours on December 11, 1986.

In February of 1986, Engineering notified Turkey Point of a potential concern on the ability of the intake cooling water (ICW) system to meet flow requirements for a design basis accident. This concerned a failure of temperature control valve (TCV) TCV-*-2201. TCV-*-2201 is the outlet flow control valve for the turbine plant cooling water (TPCW) heat exchangers. In addition to the normal control function, TCV-*-2201 receives a closure signal in the event of a safety injection signal and a loss of voltage (i.e., loss of offsite power). Assuming TCV-*-2201 failing open coincident with a loss of offsite power, a valid safeguards signal and a loss of a emergency diesel generator (EDG) could result in the ICW system not being able to provide the required flow to the CCW heat exchangers for a design basis event.

The ICW system utilizes a closed cooling canal system of salt water for a heat sink. The closed loop canal system produces a higher calcium carbonate content than would be found in normal sea water. The high level of calcium carbonate fouls the CCW heat exchanger tubes to a point that heat exchangers require frequent cleaning during the summer months.

Experience with the CCW heat exchangers has demonstrated the need to clean each heat exchanger as frequently as twice a week in order to maintain an acceptable level of efficiency. The present method of cleaning the CCW heat exchangers is done by hydrolazing or rodding which can only be done by removing a CCW heat exchanger from service. Hydrolazing is only partially effective, achieving approximately 50% recovery from the condition existing prior to this process. Therefore, rodding, which is a more time consuming process, eventually becomes a necessity.

Engineering continued to review this concern and provided an evaluation for Units 3 and 4. The evaluation provided guidance to the plant to develop a program to routinely evaluate the CCW heat exchanger performance. The evaluation done by Engineering was based on several tests that had been performed in 1985 and 1986 on CCW heat exchanger performance. This data was used to plot curves of average heat exchanger tube resistance based on assured ICW pump flow and ICW inlet temperature. Curves were developed for two and three CCW heat exchangers in operation. The curves provided by Engineering were used by the plant to develop rate of fouling curves. The rate of fouling curves placed limits on ICW inlet temperature based on the number of CCW heat exchangers in service and the necessity of stationing an operator at TCV-*-2201 to close the valve. These curves decreased with time after the CCW heat exchangers were cleaned. The frequency for cleaning the CCW heat exchangers was based on these curves. After cleaning the curves were reset back to their original value based on an expected level of cleanliness.

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 2 0	— 0 0	0 3 OF 0 4

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

On December 1, 1986, performance tests were performed on the 3A, 3B, and 3C CCW heat exchangers. The preliminary analysis of the data from these tests indicated that the cleaning done on the CCW heat exchangers had not been achieving the level of cleanliness expected. Engineering was requested to evaluate this data to determine the effect of this new data on the CCW heat exchangers.

On June 16, 1987, an additional review of the data from the December performance tests indicated that during the cleaning of a CCW heat exchanger on December 11, 1986, the requirements of the evaluation were exceeded for approximately 17 hours. The review of the data determined that the cleaning done in November did not achieve the level of cleanliness that had been assumed when the cleaning frequency curves were revised. This new data was used to plot the cleaning frequency curves and when the ICW inlet temperatures were plotted next to these curves it showed that when the 3B CCW heat exchanger was taken out of service at 0445, the ICW temperature limits of the evaluation were exceeded until the heat exchanger was returned to service at 2145 on December 11, 1986.

A review of the CCW heat exchanger performance tests done for Unit 4 during this time period indicated that while the curves for Unit 4 were decreased as did the ones for Unit 3, Unit 4 did not exceed the requirements of the evaluation.

CAUSE OF EVENT:

An evaluation of CCW heat exchanger performance data determined that the heat exchanger cleaning done previously did not clean the heat exchangers as well as in the past. The performance test data changed the curves used to determine heat exchanger cleaning frequency. A review of this revised data discovered that Unit 3 had exceeded the ICW temperature limits provided by the evaluation for approximately 17 hours on December 11, 1986.

ANALYSIS OF EVENT:

During this event Unit 3 operated at 100% power with no significant problems. Operation of Unit 3 with the ICW temperature limits provided by the evaluation being exceeded is currently being evaluated by our Engineering Department. The evaluation was based on worst case conditions to establish the limits for CCW heat exchanger cleaning frequency. Engineering is looking at the actual conditions that were present at the time of the incident to determine the safety significance of this condition. Should this evaluation significantly change this LER, a LER update will be sent accordingly.

Prior to this event, the curves used for determining CCW heat exchanger frequency were revised after cleaning based on an expected level of cleanliness. Performance tests were run periodically and that data used to revise the curves. Since this event was discovered, CCW heat exchanger performance tests have been performed after each heat exchanger cleaning and the results of the test have been used to revise the curves. Based on the above, the health and safety of the public were not affected.

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 2 0	— 0 0	0 4 OF 0 4

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

CORRECTIVE ACTIONS:

1) A plant change/modification (PC/M) PC/M 86-194 will be completed on Unit 3 to install an on-line mechanical tube cleaning capability for the CCW heat exchangers. The new cleaning systems will operate by introducing sponge rubber balls into the cooling water supply line of each heat exchanger. The normal process flow will then force the balls through the heat exchanger tubes, wiping them clean. Screens in the discharge lines will collect the balls, and a centrifugal pump will recirculate the balls to the injection point. A ball collector will also be included to allow addition or retrieval of the cleaning balls.

2) Similar modifications are planned to be implemented on Unit 4 during the next refueling outage. Unit 4 will still continue to operate under the previous evaluation until the modifications are completed.

3) After completion of the modifications on Unit 3, performance testing will be conducted while still continuing to follow the requirements of the evalution. The results of the performance test will be used to revise the evaluation for Unit 3.

4) After each cleaning of the CCW heat exchanger(s), performance tests will be performed to assure consistency in cleaning and provide proper data for the CCW heat exchanger cleaning curves.

ADDITIONAL DETAILS:

The CCW heat exchangers are shell and straight tube type. The CCW circulates through the shell side. The manufacturer of the CCW heat exchangers is Engineers & Fabricators, Inc. The model is type AEL. CD-15141-2 and serial number S-14923-C.

Similar occurrences: LER 250-86-008 and LER 250-84-025

P. O. BOX 14000, JUNO BEACH, FL

FLORIDA POWER & LIGHT COMPANY

JULY 16 1987

L-87-299
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 87-020
Date of Event: December 11, 1986
Intake Cooling Water Temperatures Exceeded Limits
Based on Engineering Evaluation for Component
Cooling Water Heat Exchangers

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/pm

Attachment

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

IE22
1/1