

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8711300254 DDC DATE: 87/11/23 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 87-030-00: on 871027, design basis reconstitution
 discovers RHR recirculation line not designed to assure
 adequate flow for each pump. Caused by plant original design.
 Plant mods will be completed. W/871123 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 ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR 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
	ARM/DCTS/DAB	1 1	DEDRO	1 1
	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/DREP/SIB	1 1	NRR/PMAS/ILRB	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

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 04					
TITLE (4) Design Basis Reconstitution Discovers Residual Heat Removal Recirculation Line Not Designed to Assure Adequate Flow for Each Pump																									
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	0	2	7	8	7	8	7	0	3	0	1	1	2	3	8	7	Turkey Point Unit 4					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(c)				50.73(a)(2)(iv)				73.71(b)											
		20.406(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				73.71(c)											
		20.406(a)(1)(ii)				50.36(c)(2)				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)(viii)(B)															
		20.406(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)															
LICENSEE CONTACT FOR THIS LER (12)																									
NAME Randall D. Hart, Licensing Engineer										TELEPHONE NUMBER AREA CODE 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 NPDs		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs															
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)

On October 27, 1987, while Unit 3 and Unit 4 were in mode 5 (cold shutdown), it was determined that a design discrepancy existed in the residual heat removal (RHR) system. During the design basis reconstitution of the RHR system, it was discovered that the existing minimum recirculation design configuration was potentially inadequate. The present RHR system design has two (2) RHR pumps discharging flow through a shared mini flow recirculation line. If the performance of one RHR pump is slightly better than the other, then it is possible for the RHR pump with the higher discharge pressure to deadhead the RHR pump with the lower discharge pressure if the reactor coolant system (RCS) pressure is above RHR pump shutoff head. The existing plant emergency operating procedures require the operator to terminate RHR if the RCS pressure is above RHR pump shutoff head. However, it cannot be assured based on existing plant procedures that this step will be accomplished prior to the potential damage of a RHR pump. This potential failure (by design) coupled with a single failure of the other operating RHR train could result in complete loss of RHR pump capability. The recirculation flow path for the RHR pumps was an original design of the plant. Plant modifications will be completed on both units to correct this discrepancy. Appropriate procedure changes and training has been completed.

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

EVENT:

On October 27, 1987, while Unit 3 and Unit 4 were in mode 5 (cold shutdown), it was determined that a design discrepancy existed in the residual heat removal (RHR) system. During the design basis reconstitution of the RHR system, it was discovered that the existing minimum recirculation design configuration was potentially inadequate. The present RHR system design has two (2) RHR pumps discharging flow through a shared mini flow recirculation line. If the performance of one RHR pump is slightly better than the other, then it is possible for the RHR pump with a higher discharge pressure to deadhead the RHR pump with lower discharge pressure if the reactor coolant system (RCS) pressure is above RHR pump shutoff head. Events where the RHR system may be required to operate on recirculation include spurious safety injection (SI), small break LOCA, or any postulated scenario where the SI signal was actuated and the RCS pressure remains above RHR pump shutoff pressure. The existing plant emergency operating procedures require the operator to terminate RHR if the RCS pressure is above RHR pump shutoff head, however, it cannot be assured based on existing plant procedures that this step will be accomplished prior to potentially damaging a RHR pump. Our NSSS vendor evaluated this concern and determined based on present conditions that a RHR pump could operate deadheaded for 10.4 minutes without pump degradation or damage. This potential failure (by design) coupled with a single failure of the other operating RHR train could result in complete loss of RHR pump capability.

CAUSE OF EVENT:

The recirculation flow path for the RHR pumps was an original design of the plant.

ANALYSIS OF EVENT:

This condition was discovered while both Units were in cold shutdown for a maintenance outage. At this time the concern identified for the RHR pumps is not applicable. Permanent changes to install individual minimum recirculation flow paths for each of the RHR pumps will be completed on each unit before the unit enters mode 4. The modified recirculation system will allow operation of both pumps for at least 30 minutes while operating in a closed loop without cooling the recirculating flow (i.e., with the pumps operating only on miniflow), thus meeting the requirements of the current emergency operating procedures. In addition, the minimum flow recirculation lines will be designed such that the injection flow assumed in the current Turkey Point Units 3 and 4 LOCA analysis will not be reduced.

For the new design of the recirculation line, maximum RHR pump flows for one and two pump cases during both injection and recirculation operation were calculated. These flows were used to generate RHR pump KW to be used in the emergency diesel generator (EDG) loading evaluation (LER 250-85-40). The increased flows resulted in increased RHR pump KW values. However, when these values were used in the EDG loading evaluation, the results indicated

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TEXT (If more space is required, use additional NRC Form 366A's (11/77))

that the worst case remains bounded by the previous EDG loading evaluation. Therefore, the EDGs can still be safely operated during design basis events as described in the final safety analysis report (FSAR) and the EDG loading evaluation.

The as discovered design condition required one RHR pump to be stopped to prevent potential pump failure due to deadhead operation and associated overheating. Existing plant emergency procedures required operators to secure RHR pumps to prevent overheating of a pump. The condition that was determined to be not acceptable was that it could not be assured the operator would be at the appropriate procedural step in less than the 10.4 minutes. However, even though this condition was found to exist, the health and safety of the public was not affected and it is judged that this condition was not a significant safety hazard based on the following:

- 1) The condition as discovered was not a problem in the design basis or large break loss-of-coolant accident (LOCA) because both RHR pumps, if running, would be delivering flow to the reactor in less than 10.4 minutes.
- 2) The condition as discovered is not a problem if any plant single failure would have resulted in one RHR pump not operating on demand.
- 3) Plant historical data indicates that for actual inadvertent SI signal actuation, the operator typically had reached the procedural step to secure RHR in less than 10.4 minutes. If the operator had not and one RHR pump had been damaged due to overheating, sufficient time would be available to restore one RHR pump prior to proceeding to a cold shutdown condition.
- 4) For a small break LOCA or other SI system actuation for which the RCS pressure remains above the RHR pump shutoff head pressure, the RHR pumps are not required on the short term.

CORRECTIVE ACTIONS:

- 1) Plant change/modifications (PC/Ms) have been developed for each unit to install independent recirculation line for each RHR pump. The lines will be designed to allow operation of the RHR pumps for at least 30 minutes without affecting pump operability or current FSAR accident analysis. These PC/Ms will be installed prior to each unit entering mode 4.
- 2) The following plant procedures have been revised to reflect implementation of the PC/Ms:
 - a) 3(4)-EOP-E-0 Reactor Trip or Safety Injection
 - b) 3(4)-EOP-ES-1.4 Transfer to Hot Leg Recirculation
 - c) 3(4)-GOP-503 Cold Shutdown to Hot Standby
 - d) 3(4)-OSP-050.2 Residual Heat Removal Pump Inservice Test
 - e) 3(4)-OP-050 Residual Heat Removal System
 - f) 0-ADM-205 Administrative Control of Valves, Locks, and Switches

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- 3) Training Brief number 213 was issued on November 12, 1987, describing the condition, the proposed modifications, and the procedures affected by the modifications.
- 4) As a part of the confirmatory order associated with EA 86-20 issued August 12, 1986, Turkey Point is currently performing a Selected Safety System review to assure that the Turkey Point Plant as built condition is consistent with the current licensing basis and has the capability within the systems to mitigate any of the design basis accidents and/or shutdown the plant.

ADDITIONAL DETAILS:

The RHR pumps are single stage centrifugal pumps manufactured by Ingersoll-Rand.

Similar Occurrences: None

FPL

NOVEMBER 23 1987

L-87-483
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: 87-30
Date of Event: October 27, 1987
Design Basis Reconstitution Discovers Residual Heat Removal Recirculation
Line Not Designed to Assure Adequate Flow for Each Pump

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
For

Executive Vice President

COW/SDF/gp

Attachment

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

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