REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8711100366 DOC. DATE: 87/11/06 NOTARIZED: NO DOCKET #
FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
AUTH. NAME AUTHOR AFFILIATION
WOODY, C. O. Florida Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-014-00: on 871008, unidentified RCS leakage greater than Tech Spec limit discovered. Caused by weld joint failure due to previous misalignment of listed flanges. Reactor shut down & required repairs performed. W/871106 ltr.

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

NOTES:

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	PD2-2 LA	1	1	PD2-2 PD	1	1
	TOURIGNY, E	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/DRIS/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

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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)
St. Lucie Unit 1	0 5 0 0 0 3 3 5	1 OF 0 4

TITLE (4) UNIDENTIFIED REACTOR COOLANT SYSTEM LEAKAGE GREATER THAN TECHNICAL SPECIFICATION LIMIT RESULTS IN REACTOR SHUTDOWN

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	0 8	8 7	8 7	— 0 1 4	— 0 0	1 1	0 6	8 7	NA	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	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)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	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
V. N. Mendoza, Shift Technical Advisor	AREA CODE 3 0 5 — 4 6 5 — 3 5 5 0

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	A B	S E A L	B 5 8 0	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On October 8, 1987, St. Lucie Unit 1 was at Mode 1, 100% power and at steady state conditions. While performing a routine 2-hour leak rate surveillance, it was discovered that there was an unidentified reactor coolant system (RCS) leakage greater than one gallon per minute (GPM) (1.09 GPM). At 0529, the Nuclear Plant Supervisor (NPS) declared an Unusual Event. Operations personnel made a containment entry to investigate the source of leakage. At 0612 hours, a controlled reactor shutdown was started so further investigations could be performed. During this investigation, the sources of the leakage were identified and determined to be less than the 10 GPM allowed by the Technical Specifications. The Unusual Event was terminated at 1405 on October 8, 1987.

Cause of the event was due to leaking check valve bonnet and a cracked pipe in the heat affected zone on the 1A1 reactor coolant pump (RCP) lower cavity seal nozzle weld. The root cause of the weld joint failure was due to the previous misalignment of the seal injection piping flange and the RCP lower cavity seal nozzle flange.

For corrective actions, the unit was shutdown and required repairs were performed and completed. The remaining reactor coolant pumps, 1A2, 1B1, and 1B2 were inspected for proper alignment of the seal injection and lower cavity seal nozzle flanges. Inspection revealed satisfactory alignment.

This event is reportable under 10 CFR 50.73 (a) (2) (i) (A), the completion of any nuclear plant shutdown required by the plant's Technical Specifications.

IE22

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
St. Lucie Unit 1	0 5 0 0 0 3 3 5	8 7	— 0 1 4	— 0 0	0 2 OF 0 4

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

DESCRIPTION OF EVENT

On October 8, 1987, Unit 1 was at Mode 1, 100% power and at steady state conditions. All controls were in their normal steady state condition lineup. While performing a routine 2-hour leak rate surveillance, it was discovered that there was Reactor Coolant System (RCS) (EIIS:AB) unidentified leakage greater than one gallon per minute (GPM) (1.09 GPM). At 0529, the Nuclear Plant Supervisor (NPS) declared an Unusual Event. State and local agencies along with the Nuclear Regulatory Commission (NRC) and plant management were notified. Operations personnel made a containment entry at 0530 to investigate and possibly identify the source of leakage. Another RCS leak rate calculation was performed to verify the leak rate. Also, operations personnel investigated other possible sources of leakage outside of containment. A report from the team of operators who made the containment entry verified a leak in the area of the reactor coolant pumps (RCP). At 0612, a controlled reactor shutdown was started so further investigations could be performed. At 0930, another containment entry was made by a team of operations and maintenance personnel to re-assess the leak. From this investigation, it was discovered that the 1A1 RCP vapor seal was spraying a mist of water, the 1A2 vapor seal was showing possible signs of leakage, the 1B1 charging system (EIIS:CB) header to the 1B1 loop was leaking, and the safety injection (EIIS:BQ) line to the 1B2 loop was suspected to be leaking. Because the exact sources of the leakage could not be identified, it was determined to remain in the unusual event. The shutdown to Mode 3 (Hot Standby) was continued. At 0913, the turbine was removed from the grid. At 1205, the reactor was shutdown and in Mode 3. A task team was formed and assigned to evaluate the situation and prepare a plan to positively identify the leakage sources and arrange for the required repairs. The team decided to stop the 1A1 RCP so that a closer investigation could be performed on the RCP area leaks. Also, arrangements were made to remove the insulation off the lines where leakage was suspected in order to positively identify the leakage sources.

The following sources of leakage were identified:

1) The 1A1 RCP leak was from a cracked weld joint on the RCP lower cavity seal nozzle connection. This was determined as a minor source of the leakage.
2) The 2-inch charging line to the 1B1 loop check valve V-2432 was leaking around the cover plate gasket. This was determined as the major source of the leakage.

The above leakage paths were estimated to be 0.5 GPM total.

At 1405, the Unusual Event was terminated because the leakage sources were identified and the leakage rate was determined to be less than 10 GPM of identified leakage as allowed by the plant's Technical Specifications. The unit was brought to Mode 5 (cold shutdown) at 1000 hours on October 9, 1987 to perform the required repairs.

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

CAUSE OF THE EVENT:

The cause of the event was the leakage on the check valve bonnet and the leakage from the cracked weld joint on the RCP lower cavity seal nozzle flange. The root cause of the cracked weld joint was due to the previous misalignment of the RCP lower cavity seal nozzle flange and the RCP lower cavity seal injection line flange. Due to this misalignment, the weld joint was stressed until the weld joint failed. The contributing factor for the weld joint failure could be attributed to the inherent vibration of the RCP. The root cause of the leakage on the check valve bonnet was due to the slight loosening of some of the bonnet bolts, which resulted in insufficient compression of the bonnet gaskets.

ANALYSIS OF THE EVENT:

Technical Specifications 3.4.6.2.b and 3.4.6.2.d, require that the reactor coolant system leakage shall be limited to: 1 GPM unidentified leakage, and 10 GPM identified leakage from the Reactor Coolant System, while plant is at Modes 1, 2, 3, & 4. Since the plant was at Mode 1, this report is being submitted under 10 CFR 50.73 (a)(2)(i)(A), the completion of any nuclear plant shutdown required by the plant's Technical Specifications. Immediately upon the discovery of the excess RCS leakage, operations personnel investigated the situation and proceeded to perform a controlled reactor shutdown within 1 hour and 22 minutes from the time of discovery in order to correctly identify and determine the amount of leakage. This was a conservative measure taken by operations personnel to ensure that the health and safety of the general public was not affected. Engineering evaluated the 1A1 RCP flange misalignment and provided the resolution to correct the problem. The remaining reactor coolant pumps 1A2, 1B1, and 1B2 were inspected for proper seal flange alignment and were found to be properly aligned.

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

CORRECTIVE ACTIONS:

1) Containment entry was made by operations and maintenance personnel to investigate and assess the situation to determine sources of leakage.
2) Once leakage sources were identified, repairs were performed on the identified leaking check valves. New gaskets were installed and valve bonnet bolts were properly torqued.
3) The 1A1 RCP seal assembly was replaced, and the RCP lower cavity seal nozzle and the RCP lower cavity seal injection line flange were re-aligned to achieve a proper flange face matchup.
4) The RCP lower cavity seal flange and seal injection flange of the three remaining RCP were inspected for proper flange alignment and all were found to be properly aligned.
5) The 1A1 and 1A2 RCP vapor seal drain lines were flushed and were found to be free of blockage.
6) All the RCP areas were inspected for signs of boric acid build-up as a preventive measure.
7) The other 2-inch charging line check valve, V-2433 was inspected as a preventive measure. The valve bonnet bolts were re-torqued.
8) The pressurizer Power Operated Relief Valve (PORV) V-1402 flange gasket was replaced and flange bolts were torqued. As a preventive measure, the other PORV, V-1404 was inspected and the inlet flange bolts were re-torqued.
9) As an additional preventive measure, the following were inspected for signs of boric acid build-up:
   a) The 12-inch safety injection line to the 1B2 loop check valve V-3247 and was found to have sign of slight boric acid at the hinge pin gasket. The gasket was replaced.
   b) The 2-inch pressurizer auxiliary spray line check valve V-2431 was found to have signs of slight boric acid build-up around the bonnet gasket. The gasket was replaced and bonnet bolts were torqued.
   c) The 3-inch 1B1 loop pressurizer main spray line check valve V-1249 was found to have signs of slight boric acid build-up around the bonnet gasket. The gasket was replaced and the bonnet bolts were torqued.
   d) Valve V-3815 had a very minor packing leak. The valve packing gland was tightened to correct the leak.

ADDITIONAL INFORMATION:

FAILED COMPONENT IDENTIFICATION:

COMPONENT: RCP Seal Assembly
MODEL NO./ Serial No.: 681-N-0448
MANUFACTURER: Byron Jackson

PREVIOUS SIMILAR EVENT:
The most recent similar event on Unit 1 was an RCS leakage greater than 1 GPM submitted under LER #335-82-014.

P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

NOVEMBER 0 6 1987

L-87-456
10 CFR 50.73

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

Gentlemen:

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 87-14
Date of Event: October 8, 1987
Unidentified Reactor Coolant System Leakage Greater Than Technical Specification Limit Results in Reactor Shutdown

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,

for C. O. Woody
Group Vice President
Nuclear Energy

COW/GRM/gp

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

Attachment

IE22
1/1