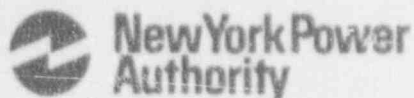


James A. FitzPatrick
Nuclear Power Plant
P.O. Box 41
Lycoming, New York 13093
315 342-3840



Harry P. Salmon, Jr.
Resident Manager

April 22, 1992
JAFF-92-0336

United States Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

SUBJECT: DOCKET NO. 50-333
LICENSEE EVENT REPORT: 91-019-01 - HPCI Declared
Inoperable Due to Instrument
Line Failure

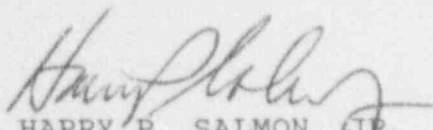
Dear Sir:

Enclosed is supplement 1 to the Licensee Event Report which was submitted in accordance with 10 CFR 50.73(a)(2)(v) on October 17, 1991.

This supplement provides the results of a detailed metallurgical analysis on a small bore pipe failure.

If there are any questions concerning this report, please contact Mr. Douglas Murphy at (315) 349-6519.

Very truly yours,


HARRY P. SALMON, JR.
RESIDENT MANAGER

HPS:DM:llm

Enclosure

cc: USNRC, Region I
USNRC Resident Inspector
INPO Records Center
JAFF File
RMS - JAF

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) JAMES A. FITZPATRICK NUCLEAR POWER PLANT	DOCKET NUMBER (2) 0 5 0 0 0 1 3 3 3 1	PAGE (3) 1 OF 0 4
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TITLE (4)
HIGH PRESSURE COOLANT INJECTION INSTRUMENT LINE FAILURE

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)
0 9	1 7	9 1	9 1	0 1	9	0 1	0 4	1 5			0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (8) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 1. CFR § (Check one or more of the following) (11)									
POWER LEVEL (10)	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(i)	<input type="checkbox"/> 50.73(a)(2)(ix)	<input type="checkbox"/> 73.71(h)						
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.38(a)(1)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(i)						
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.38(a)(2)	<input type="checkbox"/> 50.73(a)(2)(v)	OTHER (Specify in Abstract below and in Text, NRC Form 356A)						
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	<input type="checkbox"/> 50.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER
NAME DOUGLAS MURPHY	AREA CODE 3 1 5	3 1 4 9 1 - 6 5 1 9

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
B	BJ	PSF	B 3 4 5	Y					

SUPPLEMENTAL REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (1) yes, complete EXPECTED SUBMISSION DATE: <input checked="" type="checkbox"/> NO				

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

UPDATE REPORT - PREVIOUS REPORT DATE 10/17/91

ABSTRACT

EIIS Codes are in []

During normal operation at 100 percent rated power, the quarterly flow rate surveillance of the High Pressure Coolant Injection System (HPCI) [BJ] was performed on 09/17/91 in accordance with Technical Specification 4.5.C.1. The Local Leak Rate Test (LLRT) line on the HPCI turbine exhaust line check valve (23HPI-65) failed at a socket weld. Manual valve 23HPI-11 was shut in order to isolate the exhaust line from the primary containment [NH] torus. HPCI was declared inoperable initiating a 7-day Limiting Condition for Operation (LCO). Root cause evaluation of this failure indicated poor weld quality as a result of paint contamination during installation. Corrective actions included modification of the piping to reduce the bending moment of the LLRT connection. HPCI was declared operable on 9/19/91. HPCI was inoperable for 64.3 hours.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) JAMES A. FITZPATRICK NUCLEAR POWER PLANT	DOCKET NUMBER (2) 0 5 0 0 0 3 3 3	LER NUMBER (6)			PAGE (3)	
		YEAR 9 1	SEQUENTIAL NUMBER - 0 1 9	REVISION NUMBER - 0 1 1	0 2	OF 0 4

TEXT (If more space is required, use additional NRC Form 365A's) (17)

UPDATE REPORT - PREVIOUS REPORT DATE 10/17/91

EIIIS Codes are in []

DESCRIPTION

During normal plant operation at 100 percent rated power, the quarterly Surveillance Test, ST-4N, "HPCI Flow Rate and Inservice Injection (IST)", was performed on September 17, 1991 at approximately 5:07 A.M. to verify proper High Pressure Coolant Injection (HPCI) [BJ] system operation in accordance with Technical Specification 4.5.C.1. During performance of the test, the Local Leak Rate Test (LLRT) line on the HPCI turbine exhaust check valve (23HPI-65) failed at a socket weld. The line was isolated from the primary containment [NH] torus by shutting manual isolation valve 23HPI-11. The HPCI system was declared inoperable due to isolation of the turbine exhaust line.

The original LLRT piping configuration consisted of two isolation valves and a pressure gauge. The pressure gauge and one of the isolation valves are no longer used and were removed. The socket weld was repaired and the modified piping configuration was installed. This action was taken as a conservative measure to reduce the cantilevered weight on the LLRT piping.

ST-4N was performed successfully on September 19, 1991 demonstrating operability. The HPCI system was inoperable for 64.3 hours.

CAUSE

A comprehensive root cause analysis of the fractured pipe was performed. The failure mode was determined to be fatigue fracture, assisted by liquid metal embrittlement of the weld material. Zinc contamination was found in the weld area. The zinc contamination resulted in liquid metal embrittlement of the weld material. Small undersurface cracks might have been initiated at the time of welding. The subsequent small amplitude vibration induced by turbulence during HPCI system operation propagated the cracks to the point of initiating a through-wall leak. The root cause of the failure was the presence of paint on the surface of the pipe during welding.

A calculation using the original piping configuration was performed which verified the piping stress at the failed joint was below the material endurance limit for that piping class. The modified piping configuration was also evaluated for its susceptibility to the same failure mode. The evaluation shows that the new design will not experience fatigue failure.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) JAMES A. FITZPATRICK NUCLEAR POWER PLANT	DOCKET NUMBER (2) 0 6 0 0 0 3 3 3	LER NUMBER (6)			PAGE (3)	
		YEAR 9 1	SEQUENTIAL NUMBER - 0 1 9	REVISION NUMBER - 0 1	OF	

TEXT (If more space is required, use additional NRC Form 388A's) (17)

In conjunction with the root cause evaluation of the 23HPI-65 LLRT line failure, a review of previous small bore failures at JAF was performed. Results of the evaluation indicate that the failures fall into two basic categories:

1. Failures at welded connections due to poor weld quality.
2. Failures caused by vibration induced fatigue of piping.

Based on this review, a review and analysis of small bore piping attachments will be performed to establish installation guidance and inspection criteria. The installation guidance will be used to evaluate proposed small bore piping attachments. The inspection criteria will be used to evaluate existing piping to determine if the piping is likely to experience fatigue failure.

ANALYSIS

Because the HPCI system was inoperable due to failure of an LLRT line on the turbine exhaust line, it qualifies as an event reportable under 10 CFR 50.73 (a)(2)(v) as an event or condition that alone could have prevented the fulfillment of the safety function of a system needed to remove residual heat or mitigate the consequences of an accident.

Surveillance tests verified that the backup emergency core cooling system were operable. When HPCI was not available, core coverage was assured by the Automatic Depressurization System [AD], together with the Low Pressure Emergency Core Injection Systems (Low Pressure Core Spray [BM] and Residual Heat Removal/Low Pressure Coolant Injection [RO]).

CORRECTIVE ACTION

1. The socket weld was repaired and a modified piping configuration was installed. This action was taken as a conservative measure to reduce the cantilevered weight on the LLRT piping. Completed on October 19, 1991 under plant modification M1-91-251.
2. A comprehensive root cause analysis was performed on the fractured pipe. Completed on 12/16/91. Documented in JSEM-91-072.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) JAMES A. FITZPATRICK NUCLEAR POWER PLANT	DOCKET NUMBER (2) 0 5 0 0 0 3 3 3	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9 1	- 0 1 9	- 0 1	0 4	OF 0 4

TEXT (If more space is required, use additional NRC Form 365A's) (17)

3. A review and analysis of small bore piping attachments will be performed to establish installation guidance and inspection criteria. The installation guidance will be used to evaluate proposed small bore piping attachments. The inspection criteria will be used on existing piping to determine what lines are likely to experience fatigue failure. Due date 11/1/92, ACTS item number 3437. In addition, a pilot plan for evaluating piping branch lines will be performed during the 1992 Refuel Outage. Approximately 30-40 branch lines in systems that have experienced either a failure or high vibration will be inspected and evaluated for failure potential. Documented in WPO-SED-92-0141.
4. Operator training will incorporate guidance to identify piping which appears to experience excessive vibration. Operator round sheets will provide space to document these conditions. This information will be forwarded to site engineering for resolution. Due date 12/1/92, ACTS item number 3439.
5. General Welding Procedure GWP-1, "ASME/ANSI Code Welding" provides specific instruction that weld surfaces be free of paint and other deleterious material. Evaluation of the failed joint indicates weld contamination from paint had occurred. The lesson learned from this failure will be incorporated into welder training. Due date 6/30/92, ACTS item number 3440.

ADDITIONAL INFORMATION

The updated report incorporates the results of the weld failure analysis and additional corrective action to reduce the probability of recurrence.