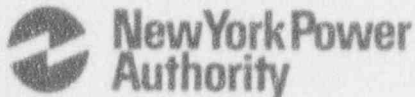


James A. FitzPatrick
Nuclear Power Plant
P.O. Box 41
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315 342-3840



Harry P. Salmon, Jr.
Resident Manager

April 6, 1994
JAFF-94-0193

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

SUBJECT: DOCKET NO. 50-333
LICENSEE EVENT REPORT: LER-94-001-01:

High Pressure Coolant Injection System Declared
Inoperable Due to Turbine Shaft Seal Leakage

Dear Sir:

This updated report is submitted in accordance with 10CFR50.73(a)(v). This update deletes Corrective Action #5, which was to balance the HPCI gland exhaust system. In preparation for performing this action, it was determined to be unnecessary based upon other actions completed which have minimized deterioration of the gland seal casing and shaft seal area. In addition, vendor system experts no longer recommend balancing of the system.

Questions concerning this report may be addressed to Mr. Donald Simpson at (315) 349-6361.

Very truly yours,

HARRY P. SALMON, JR.

HPS:DFS:tlc

Enclosure

cc: USNRC, Region I
USNRC Resident Inspector
INPO Records Center

9404120247 940406
PDR ADOCK 03000333
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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) James A. FitzPatrick Nuclear Power Plant DOCKET NUMBER (2) 05000333 PAGE (3) 01 OF 04

TITLE (4) High Pressure Coolant Injection System Declared Inoperable Due to Turbine Shaft Seal Leakage

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 NAME	DOCKET NUMBER
02	24	94	94	001	01	04	06	94	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)	100	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)	50.73(a)(2)(vii)	OTHER					
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)					
		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: Mr. Donald Simpson, Senior Licensing Engineer
TELEPHONE NUMBER (Include Area Code): (315) 349-6361

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)
The plant was operating at 100 percent power on 2/24/94 with the reactor mode switch in Run. The High Pressure Coolant Injection (HPCI) system had been declared inoperable in order to perform scheduled surveillance testing. During initial roll of the turbine, operators observed an approximate 3 to 4 foot plume of steam from the inboard shaft seal which did not diminish as the turbine came up to speed. The turbine was tripped and the limiting condition for operation for HPCI system inoperability continued.
The shaft seal was replaced and the HPCI system declared operable on 2/26/94. The steam seal leakage was caused by minor corrosion on gland seal surfaces and shaft sealing surfaces due to moisture within the turbine casing. Increased monitoring for leakage past the HPCI steam supply valve during standby conditions and corrective maintenance on the gland seal casings will improve turbine steam seal performance.
LER-89-014 describes a similar event where the HPCI system was declared inoperable due to moisture intrusion in the lubricating oil system.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	
James A. FitzPatrick Nuclear Power Plant	05000333	94	001	01

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

EIIS Codes are in []

Event Description

On February 24, 1994, the plant was operating at 100 percent power with the reactor mode switch in Run. Preparations had been completed for performing a quick start transient monitoring test on the High Pressure Coolant Injection (HPCI) [BJ] system turbine. A Limiting Condition for Operation (LCO) was entered in accordance with Technical Specification 3.5.C.1. At 0833 hours, the turbine was rolled with steam. Operators stationed at the turbine to observe the HPCI response observed a 3 to 4 foot plume of steam from the inboard turbine shaft seal. As the turbine came up to speed the leak did not diminish. The turbine was immediately tripped and the HPCI system declared inoperable. The limiting condition for operation was continued. ENS notification was completed at 0958 hours in accordance with 10CFR50.72.

The steam seal was replaced and the turbine shaft inspected for damage. The maintenance turbine engineer concluded based upon equipment failure evaluation that the installed seal had not failed, that the leakage observed was minor and would have had no significant effect on HPCI performance. Post maintenance testing on the HPCI turbine was performed and HPCI declared operational at 0056 hours on 2/26/94. The HPCI system was inoperable for approximately 40 hours.

Cause

The HPCI system seal leakage was caused by minor corrosion of the gland seal casing and pitting of the turbine shaft in the seal area. The gradual degradation of these components was due to exposure to a damp environment over an extended period of time because of past seat leakage of the HPCI steam supply isolation valve (Cause Code X). Frequent periodic testing and previous ineffectiveness of the gland exhaust system contributed to the observed degradation. Because the HPCI system is normally in a standby condition, the wetted environment permitted accelerated corrosion of the gland seal casing which prevented the carbon ring seals from providing an adequate (radial) seal when steam is admitted to the turbine. Tapered dowels, which align the upper and lower gland casing, were found to be worn and could also have contributed to the observed leakage. Minor pitting of the turbine shaft in the seal area had cut groves into the two inboard seal rings, thereby providing a second (axial) path for steam leakage.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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TEXT (if more space is required, use additional copies of NRC Form 366A) (17)

Analysis

The HPCI system is an engineered safety feature designed to provide a highly reliable source of water to the reactor vessel at sufficient pressure and volume to maintain reactor core coverage through a broad spectrum of postulated accident conditions. If this system is not available, core coverage is still assured by the Automatic Depressurization [SB] System together with other low pressure emergency core cooling systems including the two redundant trains of Core Spray [BM] and the two redundant trains of Low Pressure Coolant Injection (LPCI) [BO].

Because the HPCI system was conservatively declared inoperable upon the observation of steam seal leakage this event is reportable under 10CFR50.73(a)(2)(v) as a condition that could have prevented the fulfillment of the safety function of a system needed to remove residual heat or mitigate the consequences of an accident. The safety significance of this occurrence is low because subsequent inspection showed the seals were in good condition and that the minor leakage was due to gradual degradation of the gland casing and shaft pitting. Turbine shaft pitting had not degraded appreciably since a March, 1992 inspection in part due to implementation of vendor recommendations regarding the gland seal and exhaust system, which have minimized further degradation.

Based upon observed leakage during the test performance and subsequent inspection findings, there is reasonable assurance that the HPCI system could have performed its intended function. The leakage observed was minor and not of sufficient magnitude as to result in a system isolation due to steam leak detection or high ambient temperature.

Corrective Actions

1. New turbine shaft seals were installed on 2/25/94.
2. The HPCI steam supply isolation valve is not leaking past the seat at this time. The most recent apparent leakage occurred in February, 1993. Plant operators have initiated periodic monitoring of the HPCI turbine casing temperature during standby conditions to provide early identification of steam supply isolation valve leakage.
3. The HPCI turbine gland seal casing will be replaced or refurbished during the 1994 refuel outage.
4. The HPCI turbine shaft pitting condition will be evaluated and an action plan developed by June 30, 1994.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

Additional Information

Failed Component Identification: None

Previous Similar Events: LER-89-014, Reported the HPCI system declared inoperable due in part to steam supply isolation valve leakage which resulted in water contamination of the lubricating oil system.