James A. FitzPatrick
Nuclear Power Plant
268 Lake Road
P.O. Box 41
Lycoming, New York 13093

315-342-3840

NewYork Power Authority

**Michael J. Colomb**
Site Executive Officer

November 29, 1999
JAFP-99-0313

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

Subject: **Docket No. 50-333**
**LICENSEE EVENT REPORT: LER-99-011 (DER-99-02325)**

**High Pressure Coolant Injection System Inoperable Due to Higher Than Normal Turbine Speed**

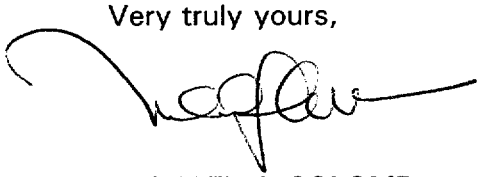
Dear Sir:

This report is submitted in accordance with 10 CFR 50.73 (a) (2) (v) (D), "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident."

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Richard Plasse, Jr. at (315) 349-6793 .

Very truly yours,



MICHAEL J. COLOMB

MJC:RAP:las
Enclosure

cc: USNRC, Region 1
USNRC, Project Directorate
USNRC Resident Inspector
INPO Records Center

IE22

PDR ADOCK 05000333

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

# LICENSEE EVENT REPORT (LER)

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



| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| James A. FitzPatrick Nuclear Power Plant | 05000333 | 1 OF 5 |

TITLE (4)

**High Pressure Coolant Injection System Inoperable Due to Higher Than Normal Turbine Speed**

| 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 |
| | | | | | | | | | N/A | 05000 |
| 10 | 27 | 99 | 99 | 011 | 00 | 11 | 29 | 99 | FACILITY NAME: N/A | DOCKET NUMBER: 05000 |

| OPERATING MODE (9) | N |
|---|---|
| POWER LEVEL (10) | 40 |

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 20.2201(b) | | 20.2203(a)(2)(v) | | 50.73(a)(2)(i) | | 50.73(a)(2)(viii) |
| | 20.2203(a)(1) | | 20.2203(a)(3)(i) | | 50.73(a)(2)(ii) | | 50.73(a)(2)(x) |
| | 20.2203(a)(2)(i) | | 20.2203(a)(3)(ii) | | 50.73(a)(2)(iii) | | 73.71 |
| | 20.2203(a)(2)(ii) | | 20.2203(a)(4) | | 50.73(a)(2)(iv) | | OTHER |
| | 20.2203(a)(2)(iii) | | 50.36(c)(1) | X | 50.73(a)(2)(v) | | Specify in Abstract below or in NRC Form 366A |
| | 20.2203(a)(2)(iv) | | 50.36(c)(2) | | 50.73(a)(2)(vii) | | |

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER (Include Area Code) |
|---|---|
| Richard Plasse, Sr. Licensing Engineer | 315-349-6793 |

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
|---|---|---|---|---|---|---|---|---|---|---|
| X | BG | | | | | | | | | |
| | | | | | | | | | | |

| SUPPLEMENTAL REPORT EXPECTED (14) | | | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|---|---|---|---|---|---|
| X | YES (If yes, complete EXPECTED SUBMISSION DATE). | | NO | | 03 | 31 | 2000 |

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 27, 1999 the plant was operating at approximately 40% power, during power ascension. AT 1750 hours, the High Pressure Coolant Injection (HPCI) system was declared inoperable due to an unexplained HPCI turbine speed increase during the previous surveillance test. System engineering and maintenance personnel review of available data determined that a HPCI turbine speed of approximately 4833 RPM was reached. Maximum turbine speed during a normal HPCI startup is expected to be approximately 4300 RPM.

Troubleshooting activities of the unexpected HPCI turbine speed increase identified several likely contributors to the anomalous control system response. Several recommendations and repairs were completed to the HPCI control system.

The cause of the unexpected HPCI turbine speed increase has not been conclusively determined. An Equipment Failure Evaluation is ongoing. Engineering is currently doing a review of all the available test data. HPCI system has been placed on increase frequency surveillance testing to allow additional test data collection. The root cause may be identified from the additional test and inspection activities.

EIIS Codes in [ ]

**Event Description**

On October 14, 1999, an automatic Main Turbine [TA] trip occurred followed by a Reactor Scram. During the event, the High Pressure Coolant Injection (HPCI) turbine [BJ] tripped on overspeed. During subsequent troubleshooting the most likely cause of the overspeed trip was determined to be the Remote Servo, which was replaced (See LER-99-010 for details). To verify this was the root cause of the overspeed trip, a post-maintenance test plan was developed. The test plan required testing the HPCI turbine at both low and high pressure conditions, which was required by Technical Specifications, during the subsequent plant startup.

On October 25, 1999, at 0242 hours, HPCI was declared operable. This declaration was based on satisfactory results during the low pressure test conducted in the "startup" mode at approximately 150 psig. Based on the satisfactory results, operators continued with a normal plant power ascension into the "run" mode.

A subsequent test of the HPCI system was performed at full operating pressure in the "run" mode. Based on this test, on October 27, 1999, at 0130 hours, the HPCI system was declared operable. The operating crew declared the HPCI system operable based on the HPCI system providing the required system flow at the required pressure with all the surveillance test acceptance criteria being met.

During a subsequent engineering review of the turbine speed data, taken during the full operating pressure surveillance test, the system engineer identified an unexplained HPCI turbine speed of approximately 4833 RPM. Maximum turbine speed during a normal HPCI startup is expected to be approximately 4300 RPM. The HPCI overspeed trip setpoint is set at approximately 5100 RPM.

On October 27, 1999, at 1750 hours, with the plant operating in the "run" mode at approximately 40 percent power, the HPCI system was declared inoperable. The Operations crew, based on engineering input, concluded that it would be prudent to declare the HPCI system inoperable until the unexpected HPCI turbine speed could be evaluated and resolved. The NRC Operations Center was informed via the Emergency Notification System at 1953 on October 27, 1999.

| FACILITY NAME (1) | DOCKET (2) | LER NUMBER (6) | | | PAGE (3) |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| James A. FitzPatrick Nuclear Power Plant | 05000333 | 99 | 011 | 00 | 3 OF 5 |

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

**Event Description** (cont'd.)

The 7 day limiting condition of operation (LCO) was entered in accordance with TS 3.5.C.1.a based on the time of the completion of initial full operating pressure test (i.e. 0130 on October 27, 1999). The anomalous response did not occur during the low pressure (150 psig) test.

A troubleshooting plan was developed including a temporary surveillance test, TST-101, to obtain data for HPCI turbine control loop troubleshooting. Between October 29 and November 1, 1999, five HPCI runs were completed with TST-101. Review of transient data logs from the TST-101 runs for HPCI pressure, flow, and turbine speed, showed that there was no repeat of the unexpected speed response identified in the October 27, 1999 high pressure test.

Troubleshooting activities of the unexpected HPCI turbine speed increase identified several likely contributors to the anomalous control system response. Several recommendations and repairs were completed to the HPCI controls which included: (a) the EG-R governor was replaced; (b) HPCI flow controller was adjusted; (c) HPCI lube oil supply isolation valve 23HPI-316 was repositioned from a partially open to a full close position; (d) turbine speed magnetic pickup was replaced; (e) several pressure instruments were recalibrated;(f) HPCI turbine hydraulic control fluid bypass check valve 23HPI-124 was replaced; (g) balance chamber adjustments to the turbine stop valve 23HOV-1 were made; and(h) linkages on the turbine control valve 23HOV-2 were inspected for freedom of movement.

The quarterly full operating pressure HPCI test was repeated with satisfactory results and HPCI was restored to an operable status at 0423 hours on November 2, 1999. HPCI had been inoperable for a total of approximately 6 days and 2 hours.

**Cause of Event**

Although the ongoing EFE has identified several likely contributors, the cause of the unexpected HPCI turbine speed increase has not been conclusively determined (Cause Code X). An engineering and maintenance team has evaluated the information from the troubleshooting efforts, including the repairs and test data. The only conclusion the team has reached after having evaluated all the available evidence is that the repairs completed to the HPCI control system have improved performance and prevented recurrence of the overspeed events experienced on October 14, 1999 and October 27, 1999. The team recommends increased frequency (monthly) HPCI surveillance testing for at least 3 months to allow collection of additional test data for further analysis.

| FACILITY NAME (1) | DOCKET (2) | LER NUMBER (6) | | | PAGE (3) |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| James A. FitzPatrick Nuclear Power Plant | 05000333 | 99 | 011 | 00 | 4 OF 5 |

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

**Cause of Event** (cont'd.)

The root cause may be identified from information obtained from the additional test and inspection activities. This LER will be supplemented to include additional information that is identified and/or additional corrective actions that are recommended.

**Event Analysis**

The safety significance of this condition was minimal because HPCI was available and achieved the required flow rate in the required time as demonstrated on October 27, 1999. HPCI system operation at a higher than normal turbine speed may constitute a safety system functional failure as defined by NEI 99-02, Draft D. Engineering continues to evaluate HPCI's capability to function.

The Automatic Depressurization System (ADS) [SB], Residual Heat Removal (RHR) [BO], and Core Spray (CS) [BM] systems were available as redundant emergency core cooling systems during the duration of the troubleshooting period. The Reactor Core Isolation Cooling (RCIC) [BN] system was available as a source of high pressure injection.

**Corrective Actions**

1. HPCI system troubleshooting and repairs were completed. The root cause of the overspeed events has not been conclusively identified. Test data indicates that repairs have improved performance and prevented recurrence of the overspeed events. HPCI was declared operable. **(Completed)**

2. Increase HPCI system testing frequency from quarterly to monthly using additional instrumentation for the next 3 months to assist in further data collection to aid in root cause determination. **(Scheduled Completion: 01/31/2000)**

3. Perform an equipment failure evaluation. **(Scheduled Completion: 02/28/2000)**

| FACILITY NAME (1) | DOCKET (2) | LER NUMBER (6) | | | PAGE (3) |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| James A. FitzPatrick Nuclear Power Plant | 05000333 | 99 | 011 | 00 | 5 OF 5 |

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

## Additional Information

Previous Similar Events: Will be determined based on EFE results. LER-95-008 was a previous event where HPCI experienced an overspeed condition due to system flow control deficiencies.

Extent of Condition: Will be determined based on EFE results.