



**Entergy**

**Entergy Nuclear Northeast  
Entergy Nuclear Operations, Inc.**

James A. FitzPatrick NPP  
P.O. Box 110  
Lycoming, NY 13093

**Pete Dietrich**  
Site Vice President - JAF

JAFP-10-0026  
February 17, 2010

United States Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555

**SUBJECT:** LER: 2009-008-00, High Pressure Coolant Injection System Inoperable  
Longer Than Allowed By Technical Specifications  
James A. FitzPatrick Nuclear Power Plant, Unit No. 1  
Docket No. 50-333  
License No. DPR-59

**REFERENCE:** Entergy Letter, JAFP-10-0002, LER: 2010-001-00, High Pressure  
Coolant Injection System Inoperable Longer Than Allowed By Technical  
Specifications, dated January 11, 2010

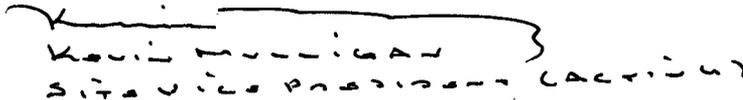
Dear Sir or Madam:

On January 11, 2010 Entergy Nuclear Operations, Inc. (ENO), submitted LER: 2010-001-00  
in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited  
by the plant's Technical Specifications...". It was later determined that the LER was numbered  
incorrectly. This letter resubmits the LER with number corrected, replacing the earlier submittal  
in its entirety.

There is no commitment contained in this report.

Questions concerning this report may be addressed to Mr. Joseph Pechacek, Licensing  
Manager, at (315) 349-6766.

Sincerely,



Pete Dietrich  
Site Vice President - JAF

PD/JP/ed

**Enclosure:** 1. JAF LER: 2009-008-00, High Pressure Coolant Injection System Inoperable  
Longer Than Allowed By Technical Specifications

JE 22  
NRR

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

**LICENSEE EVENT REPORT (LER)**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**1. FACILITY NAME**

**James A. FitzPatrick Nuclear Power Plant (JAF)**

**2. DOCKET NUMBER**

**05000333**

**3. PAGE**

**1 OF 4**

**4. TITLE**

**High Pressure Coolant Injection System Inoperable Longer Than Allowed By Technical Specifications**

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	17	2009	2009	008	00	01	11	2010	N/A	
									N/A	

**9. OPERATING MODE**

**01**

**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)**

- |   |   |   |   |
|---|---|---|---|
| <input type="checkbox"/> 20.2201(b)         | <input type="checkbox"/> 20.2203(a)(3)(i)             | <input type="checkbox"/> 50.73(a)(2)(i)(C)  | <input type="checkbox"/> 50.73(a)(2)(vii)     |
| <input type="checkbox"/> 20.2201(d)         | <input type="checkbox"/> 20.2203(a)(3)(ii)            | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1)      | <input type="checkbox"/> 20.2203(a)(4)                | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i)   | <input type="checkbox"/> 50.36(c)(1)(i)(A)            | <input type="checkbox"/> 50.73(a)(2)(iii)   | <input type="checkbox"/> 50.73(a)(2)(ix)(A)   |
| <input type="checkbox"/> 20.2203(a)(2)(ii)  | <input type="checkbox"/> 50.36(c)(1)(ii)(A)           | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x)       |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2)                  | <input type="checkbox"/> 50.73(a)(2)(v)(A)  | <input type="checkbox"/> 73.71(a)(4)          |
| <input type="checkbox"/> 20.2203(a)(2)(iv)  | <input type="checkbox"/> 50.46(a)(3)(ii)              | <input type="checkbox"/> 50.73(a)(2)(v)(B)  | <input type="checkbox"/> 73.71(a)(5)          |
| <input type="checkbox"/> 20.2203(a)(2)(v)   | <input type="checkbox"/> 50.73(a)(2)(i)(A)            | <input type="checkbox"/> 50.73(a)(2)(v)(C)  | <input type="checkbox"/> OTHER                |
| <input type="checkbox"/> 20.2203(a)(2)(vi)  | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) | <input type="checkbox"/> 50.73(a)(2)(v)(D)  | Specify in Abstract below or in NRC Form 366A |

**10. POWER LEVEL**

**100**

**12. LICENSEE CONTACT FOR THIS LER**

**FACILITY NAME**

Mr. Joseph Pechacek, Licensing Manager

**TELEPHONE NUMBER (Include Area Code)**

(315) 349-6766

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
—	—	—	—	—	—	—	—	—	—

**14. SUPPLEMENTAL REPORT EXPECTED**

Yes (If yes, complete 15. EXPECTED SUBMISSION DATE)  NO

**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR
—	—	—

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

On September 17, 2009, a root cause analysis of the High Pressure Coolant Injection (HPCI) TURBINE STEAM SUPPLY STOP VALVE (23HOV-1) failure in January 2009 discovered that a previous change to the In-service Testing (IST) opening stroke time reference value had been incorrectly raised from 19.45 seconds to 22.12 seconds. The change, which was made on August 10, 2005, was not properly evaluated and did not contain adequate technical justification in accordance with the ASME OM Code. The cause of this event is attributed to personnel error in the implementation of the IST Program. Specifically, the opening stroke time reference value was revised without the appropriate technical justification. The change masked a degrading trend in the 23HOV-1 opening stroke time and resulted in the inoperability of the HPCI system.

The condition is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications..." because during the time period described, the HPCI system was inoperable longer than allowed by the TS completion times. Although the HPCI system was technically inoperable prior to the maintenance activity, the HPCI system would have started and injected to the core, if required, within the required system initiation time of 60 seconds, and would have been able to perform its safety function during the eight hour mission time assumed in the JAF accident analyses.

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NARRATIVE

**BACKGROUND**

The High Pressure Coolant Injection (HPCI) System [EIS System Identifier: BJ] is comprised of various components which include pumps, valves, piping, and instrumentation. The function of the HPCI system is to ensure that the reactor is adequately cooled to limit fuel clad temperature in the event of a small break loss of coolant accident (LOCA) which does not result in rapid depressurization of the reactor vessel. The HPCI system permits the plant to be shutdown while maintaining sufficient reactor vessel water inventory until the reactor vessel pressure is low enough to allow the Low Pressure Coolant Injection (LPCI) System [EIS System Identifier: BO] or Core Spray (CS) System [EIS System Identifier: BM] to maintain core cooling.

The HPCI TURBINE STEAM SUPPLY STOP VALVE (23HOV-1) [EIS Component Identifier: V] is a hydraulically operated valve that is either fully closed (following turbine trip and in the standby condition) or full open (during turbine operation). Its safety function is to open once sufficient hydraulic pressure is developed, thus allowing steam to supply the HPCI turbine. 23HOV-1 is also designed to close automatically and trip the HPCI turbine in the event of a turbine overspeed, high turbine exhaust pressure, low pump suction pressure, or low steam supply pressure.

**EVENT DESCRIPTION**

On September 17, 2009, a root cause analysis (RCA) was performed as a result of the 23HOV-1 failure to meet the In-service Testing (IST) opening stroke time during a maintenance activity performed earlier in the year in January. The RCA discovered that a change performed on August 10, 2005, raised the opening stroke time reference value from 19.45 seconds to 22.12 seconds. This resulted in the upper time limit being increased from 24.3 seconds to 27.6 seconds. In order to change reference values, the ASME OM code requires that the cause of the deviation be understood and documented. In this case, the change did not contain the technical justification that is required in accordance with the ASME OM Code. As such, subsequent testing of 23HOV-1 stroke times that were within the new (incorrect) values, but outside the old (correct) values was not identified as causing 23HOV-1 and the HPCI System inoperable.

The first HPCI surveillance test using the new stroke time acceptance criteria was performed in November, 2005. From November 1, 2005, until January 31, 2009, the Turbine Steam Supply Stop Valve stroke times were tested fourteen times. In four of those tests, the opening stroke time was above the original upper time limit. The failure of 23HOV-1 to meet the IST acceptance criteria should have resulted in declaring the HPCI system inoperable as required by ASME OM code. JAF Technical Specifications (TS) require the plant to be in MODE 3 within 14.5 days if HPCI is inoperable as long as the low pressure Emergency Core Cooling (ECCS) injection/spray system is operable or within 84 hours if one subsystem of ECCS injection/spray is also inoperable. The failure to meet ASME code acceptance criteria for the stroke time was not previously identified since the valve met the revised IST acceptance criteria and it had not yet been discovered that the change was performed in error.

The event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications..." because during the time period described, the HPCI system was inoperable longer than allowed by the TS completion times.

**EVENT ANALYSIS**

Following a scheduled HPCI outage during the month of January 2009, post maintenance testing was being performed to ensure that the HPCI system was operable prior to returning it to service. To verify operability, Operations personnel performed the HPCI Quick Start Procedure (ST-4N) which requires stroking of 23HOV-1 and verifying the stroke times meet acceptance criteria as established by the IST program. The first attempt at performing this procedure on January 23, 2009, was unsuccessful. As a result, personnel began troubleshooting the HPCI system for likely causes. Troubleshooting and repair lasted several days until January 31, 2009, when testing was able to verify that the HPCI system was repaired. On January 31, 2009, at approximately 12:40 pm, the HPCI system was returned to service.

As a result of the failure to stroke within the required time, an RCA focusing on the mechanistic failure of the turbine stop valve was performed. The analysis discovered that the IST opening stroke time had been incorrectly changed on August 10, 2005. The reference value change (IST-2005-001) documented that the change to the opening stroke time reference value was performed in accordance with AMSE OM-10, Section 4.2.1.8 (Paragraph 3.5). Paragraph 3.5 is intended to allow the owner to establish an additional set of reference values when a particular test can have different sets of test conditions. Paragraph 3.5 was misapplied to the reference value change because an additional set of reference values was not being established. Instead, the existing reference value was improperly raised from 19.45 seconds to 22.12 seconds based on trend data that showed the stroke time was trending towards the upper Code acceptance limit. The change in reference value corresponded to a change in the opening stroke time upper limit from 24.3 seconds to 27.6 seconds.

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The HPCI Turbine Stop Valve opening stroke time exceeded the pre-2005 Code acceptance criterion on four occasions between the date IST-2005-001 was implemented and January 2009. Per ASME OM Code Article ISTC-5143(a) "If a valve fails to exhibit the required change of obturator position or exceeds the limiting values of full stroke time [see ISTC-5141(b)], the valve shall be immediately declared inoperable."

The ASME OM Code allows for establishing Limiting Values that are greater than acceptance criteria, however, in the case of 23HOV-1 no such values were previously established. When no Limiting Values are established, the stroke time becomes the Limiting Value for the purposes of OM Code Compliance. Since the stroke times measured between 2005 and 2009 exceeded the pre-change upper time limit, the valve should have been declared inoperable.

Between February 2009 and November 2009, additional review of the IST stroke time change was performed to include consultation with an industry subject matter expert on the IST program. It was originally believed that the TS start time of 60 seconds could be considered the limiting time for IST purposes. This conclusion was determined to be in error and it was subsequently determined this condition was reportable per 10 CFR 50.73.

**CAUSE OF EVENT**

The cause of this event is attributed to personnel error in the implementation of the IST program. Specifically, a section of the ASME OM code which allows establishing a new set of reference values under a different set of test conditions was mis-applied to allow changing an existing reference value.

The reference value change masked an overall degrading trend in the valve opening stroke time because it adjusted the reference opening time to account for valve stroke within the previous 2-1/2 years without determining the cause of the increasing stroke time trend. This change was technically inaccurate in that it was performed as a re-baseline without determining the reason for the change in stroke time as required by the ASME OM code.

**EXTENT OF CONDITION**

An extent of condition review was performed by the Engineering department to identify any other potentially degrading components that acceptance criteria had been changed in order to accept a degrading trend. This review did not find any other instances of improper changes to IST acceptance criteria.

**FAILED COMPONENT IDENTIFICATION**

Manufacturer: AMETEK  
 Model No.: M67-05774-V  
 NPRDS Manufacturer Code: A365  
 NPRDS Component Code: V  
 FitzPatrick Component Id: 23HOV-1

**CORRECTIVE ACTIONS (All Complete)**

1. An extent of condition review was performed to identify any other potential degrading components within the purview of the IST program. See Extent of Condition section.
2. The IST program supervisor and program owner have been coached and understand the nature of the cause of this event.
3. A technical basis for 23HOV-1 was developed to include adequate stroke time limitations. This was accomplished by engineering evaluation IST-2009-017 which established Limiting Values for 23HOV-1.

**ASSESSMENT OF SAFETY CONSEQUENCES**

Actual Consequences

There were no actual industrial, radiological, or nuclear safety consequences during or as a result of the described period of HPCI inoperability. However, the improper changes to the IST reference stroke time masked a degrading trend in opening stroke times that eventually resulted in the failure of 23HOV-1 to open during testing.

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Potential Consequences

During the period between 2005 and 2009, the HPCI System was routinely tested under the Surveillance Test Program to confirm its OPERABILITY. Those tests were completed satisfactory or the system was declared INOPERABLE and the deficiency was corrected. The surveillance tests demonstrated that the HPCI system was capable of starting on demand, supplying cooling water to the core at rated pressure and flow rates, and was capable of stopping and restarting. Based on that information, Engineering has determined, that prior to the maintenance activities conducted in January 2009, the HPCI system would have started and injected to the core, if required, within the required system initiation time of 60 seconds and would have been able to perform its safety function during the eight hour mission time assumed in the JAF accident analyses. Therefore, this condition did not constitute a safety system functional failure.

**SIMILAR EVENTS**

A review of operating experience at JAF was performed to identify any similar events involving personnel errors in the implementation or interpretation of the ASME OM code. While there have been human performance errors, there have been no other instances of inappropriate changes based on misunderstanding the ASME OM Code.

**REFERENCES**

1. JAF Condition Reports: CR-JAF-2009-00350, CR-JAF-2009-03964, CR-JAF-2009-00284, CR-JAF-2009-00286
2. Root Cause Analysis Report: 23HOV-1 Failed To Open (CR-JAF-2009-00350)
3. JAF Updated Final Safety Analysis Report: Section 6.4.1, High Pressure Coolant Injection System
4. JAF Technical Specifications 3.5.1, Emergency Core Cooling Systems – Operating
5. JAF Procedure: SEP-IST-007, Pump and Valve In-service Testing Program
6. JAF Procedure: ST-4N, HPCI QUICK-START, INSERVICE, AND TRANSIENT MONITORING TEST (IST)