



Entergy Nuclear Northeast  
Entergy Nuclear Operations, Inc.  
James A. Fitzpatrick NPP  
P.O. Box 110  
Lycoming, NY 13093  
Tel 315 349 6024 Fax 315 349 6480

October 16, 2003  
JAFP-03-0142

T.A. Sullivan  
Site Vice President - JAF

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-03-002 (CR-JAF-2003-04321)**

**Safety Relief Valve Setpoints Outside of Allowable Tolerances**

Dear Sir:

This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications..."

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Darren Deretz at (315) 349-6851.

Very truly yours,

*Art Zarembo per telecon*  
T. A. Sullivan *hs chdy*

TAS:DD:dd  
Enclosure

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

*IE22*

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 information collection does not display a currently valid OMB control

**LICENSEE EVENT REPORT (LER)**

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

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

4. TITLE  
Safety Relief Valve Setpoints Outside of Allowable Tolerances

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	19	03	03	- 02 -	00	10	16	03	N/A	05000
									N/A	05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR'S: (Check all that apply)					
	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
10. POWER LEVEL 100	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)	50.73(a)(2)(x)
	20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)	73.71(a)(4)
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)	73.71(a)(5)
	20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)	OTHER
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)	
	20.2203(a)(2)(v)	X	50.73(a)(2)(i)(B)		50.73(a)(2)(vii)	
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)	
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME Mr. Darren Deretz, Sr. Licensing Specialist	TELEPHONE NUMBER (Include Area Code) (315) 349-6851
---	--

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
B	SB	RV	T020	Y					

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

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

Review of the as-found setpoints for 11 Safety Relief Valve (SRV) [SB] pilot assemblies, removed at the end of Cycle 15, determined that 3 SRVs were outside the allowable as-found tolerance of 1145 psig +/- 34.3 psig (+/- 3%) required by Technical Specifications (TS) Surveillance Requirement (SR) 3.4.3.1. This report documents the failure to meet this SR for 3 of the 11 SRVs.

The effect of 3 SRVs being out of tolerance during Cycle 15 is analyzed in this report. The results of this analysis show that Reactor Pressure Vessel (RPV) overpressure protection and nuclear plant safety were not adversely affected. The cause of the two high out of tolerance SRV setpoints was determined to be corrosion bonding between the SRV pilot disc and seat, a recognized industry generic problem.

The cause of the low out of tolerance SRV pilot test failure was determined to be sticking of the air operator following the pilot diagnostic test. This SRV pilot tested satisfactorily on 3 subsequent test lifts.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2	OF 5
James A. FitzPatrick Nuclear Power Plant	05000333	03	002	00		

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

EIS Codes in [ ]

**Event Description:**

On August 19, 2003, while the plant was operating at 100 percent power, FitzPatrick was notified that three Safety Relief Valve (SRV) [SB] pilot assemblies removed at the end of Cycle 15 had as-found setpoints outside the allowable tolerance of 1145 psig +/- 34.3 psig (+/- 3%).

This allowable tolerance (1110.7 to 1179.3 psig) is required per Technical Specifications (TS) Surveillance Requirement (SR) 3.4.3.1. Two SRVs exceeded the high limit of 1179.3 psig and one SRV exceeded the low limit of 1110.7 psig.

The removed SRV pilots were tested at Wyle Laboratories during the period July 29 through August 5, 2003. The results from these tests were reported to FitzPatrick by Wyle Laboratories on August 19, 2003.

**Test Results:**

Pilot Serial Number	Plant Valve Number	As-Found Setpoint	Pass/Fail (pass unless otherwise noted)
1053	02RV-71B	1140	
1236	02RV-71H	1197	Fail
1191	02RV-71E	1142	
1087	02RV-71J	1168	
1111	02RV-71D	1134	
1239	02RV-71K	1158	
1045	02RV-71A	1222	Fail
1013	02RV-71C	1104	Fail
1235	02RV-71G	1146	
1051	02RV-71F	1143	
1110	02RV-71L	1139	

TS LCO 3.4.3 requires nine operable SRVs when in Modes 1, 2 or 3. Specifically, the TS states:

*The safety function of 9 SRVs shall be OPERABLE.*

Since three pilot valves exceeded the allowable setpoint range, this report is being made under 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications..."

**Cause of Event:**

The cause of the two high out of tolerance pilot setpoints was determined to be corrosion bonding between the SRV pilot disc and seat [Cause Code B]. With a bond forming between the pilot disc and seat, more pressure is needed to raise the pilot disc off the seat. Since the normal balance of pilot assembly spring force and steam pressure force necessary to lift the pilot disc corresponds to the nominal setpoint of the SRV, the pilot disc to seat bond results in a higher pilot setpoint.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3	OF 5
James A. FitzPatrick Nuclear Power Plant	05000333	03	002	00		

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

**Cause of Event: (continued)**

An oxygen rich environment in the pilot assembly, due to the radiolytic breakdown of water to hydrogen and oxygen, causes the corrosion bonding. Oxygen accumulates in the area of the pilot disc because the pilot assembly is a high point on the main steam [SB] line.

The cause of the SRV testing low out of tolerance was determined to be sticking of the air operator stem in conjunction with the pilot diagnostic test that preceded the SRV test failure. The diagnostic test is performed to determine the presence of pilot disc-seat corrosion bonding. During subsequent troubleshooting, abnormal air actuator stem movement was observed, which indicated increased friction or "stickiness". This initial pre-test cycling of the operator pilot set spring, combined with the observed friction, prevented the pilot set spring from fully extending, creating a "preloaded" condition. This preloaded condition reduced the overall steam pressure required for lifting the pilot disc, thereby causing the SRV to lift at a lower pressure. [Cause Code B]

On 3 subsequent tests of this SRV pilot, it lifted at 1142 psig, 1138 psig and 1142 psig, respectively. No pilot diagnostic test was performed immediately prior to these subsequent tests, which precluded the potential for a pilot set spring preloaded condition. Consequently, this performance is likely most representative of the setpoint during the operating cycle, because the potential for spring preloading would be precluded by the environmental vibration conditions.

**Event Analysis:**

The SRVs provide overpressure protection for the Reactor Coolant Pressure Boundary (RCPB) as required by the ASME Boiler and Pressure Vessel Code. SRV pilots actuating at pressures higher than the required setpoint may be significant if adequate overpressure protection is not available.

Two analyses are used in determining the adequacy of overpressure protection; the RCPB Overpressure Analysis and the Anticipated Transient Without Scram (ATWS) analysis. The RCPB Overpressure Analysis is performed each fuel cycle based on the worst case anticipated transient with nine SRVs opening at an analyzed Upper Limit pressure of 1195 psig, and two SRVs out of service. Additionally, the current ATWS analysis was performed using the worst case ATWS with two SRVs out of service and the other nine opening at setpoints derived from Cycle 13 as-found test results. Review of the Cycle 15 test results has determined that the associated worst case setpoints are bounded by both of the above analyses.

The out-of-tolerance condition reported by this LER did not compromise overpressure protection for either analyzed event. Thus, the current analysis demonstrates satisfactory results with two SRVs failing above the setpoint range and one SRV failing below the setpoint range.

The safety significance of this event is therefore minimal because the system safety function would have been achieved in accordance with the assumptions made in the design basis safety analysis.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)	
James A. FitzPatrick Nuclear Power Plant	05000333	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4	OF 5
		03	002	00		

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

**Extent of Condition:**

All of the SRVs are susceptible to setpoint drift due to pilot disc to seat bonding. This is an industry issue that has been the subject of both NRC and BWROG generic assessment. In general, FitzPatrick SRV pilot performance has improved over the past few cycles, as indicated by a reduced number of out of tolerance high pilot test failures from each group of pilot assembly tests. However, failures due to the generic industry issue continue to occur.

The BWROG recommended modification to provide pressure switch actuation of the SRVs was operational during Cycle 15. This modification provides an electric actuation of SRV pilot valves based upon a pressure switch setpoint. This provides a diverse, redundant method of SRV actuation, which overcomes the pilot disc-seat bonding effect. As such, this modification will mitigate and limit the extent of condition to one part of a diverse SRV actuation methodology.

The SRV pilot that tested low out of tolerance due to sticking of the air operator stem is considered a unique case, as there is no industry evidence of a previous occurrence of an air operator stem sticking.

**Corrective Actions:**

*Corrective Actions Completed Prior to this Report:*

1. All SRV Pilots were removed from the plant during Refuel Outage 15 (October 2002) and replaced with newly refurbished and test certified pilots for Cycle 16.
2. The BWROG recommended modification to provide pressure switch actuation of the SRVs was operational during Cycle 15 when these valves were in service.
3. All SRV pilot assemblies are tested and replaced each operating cycle.

*Corrective Actions for this Event:*

1. Ensure Pilot #1013 air actuator is refurbished, and the affected air operator stem and body are replaced, as part of the pilot rebuild prior to certification testing. This action will be completed prior to Refuel Outage 16 (October 2004). (JAF CR-2003-04321-CA-05)  
*(Scheduled Completion Date 07/15/2004)*
2. Discontinue performance of the pilot diagnostic test as part of as-found setpoint testing. This test no longer provides useful information and has the potential to bias pilot lift test results. This action will be completed prior to the next SRV pilot assembly tests. (JAF CR-2003-04321-CA-06)  
*(Scheduled Completion Date 06/15/2004)*

**Safety System Functional Failure Review:**

This event did not result in a safety system functional failure as defined by NEI 99-02, Revision 2.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5	OF 5
James A. FitzPatrick Nuclear Power Plant	05000333	03	002	00		

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

**Similar Events:**

1. JAF LER-01-005 "Safety Relief Valve Setpoint Drift," August 17, 2001.
2. JAF LER-99-003 "Safety Relief Valve Setpoint Drift," March 16, 1999.
3. JAF LER-98-002 "Safety Relief Valve Setpoint Drift," April 9, 1998.

**Failed Component Identification:**

Manufacturer: Target Rock Corporation  
 Model Number: 7567F-10  
 NPRDS Manufacturer Code: T020  
 NPRDS Component Code: Valve  
 FitzPatrick Component ID: 02RV-071A, C & H

**References:**

1. JAF Condition Report CR-JAF-2003-04321, associated cause analyses and Wyle Laboratories Notice of Anomalies Number 1 for Entergy Purchase Order 4500524037.
2. GE-NE-A42-00137-2-01 rev 1, 'ATWS Overpressure Analysis for FitzPatrick,' dated July, 2003.