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August 17, 2001
JAFP-01-0195

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-01-005

Safety Relief Valve Setpoint Drift

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. John Hoddy at (315) 349-6538.

Very truly yours,

T. A. SULLIVAN

TAS:JH:jrh
Enclosure

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

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

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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)
Safety Relief Valve Setpoint Drift

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
06	19	01	01	005	0	08	17	2001	FACILITY NAME	DOCKET NUMBER
									N/A	05000

OPERATING MODE (9)	N
POWER LEVEL (10)	100

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

	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)

	50.73(a)(2)(viii)
	50.73(a)(2)(x)
	73.71
	OTHER
	Specify in Abstract below or in NRC Form 366A

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Mr. John R. Hoddy, Sr. Licensing Engineer	(315) 349-6538

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	AD	RV	T020	Y					

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

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

Review of the as-found setpoints for 11 Safety Relief Valve (SRV) [SB] pilot assemblies, removed during Cycle 14, determined that 2 SRVs were outside the allowable as-found tolerance of 1145 psig +/- 3 percent required by Technical Specification (TS) requirement 4.6.E. TS 3.6.E requires a minimum of 9 SRVs to be operable; therefore the requirements of TS 3.6.E were satisfied. Additional requirements pertaining to the Anticipated Transient Without Scram (ATWS) High Pressure actuation setpoint (TS Table 3.2-7, Note 3) were not satisfied, however. This report documents this Technical Specification non-compliance.

The effect of 2 SRVs being out of tolerance during Cycle 14 is also analyzed in this report. The results of this analysis shows that Reactor Pressure Vessel (RPV) overpressure protection and nuclear plant safety were not adversely affected. The cause of the out of tolerance SRV setpoints was determined to be corrosion bonding between the SRV pilot disc and seat, a recognized industry generic problem. Modifications consistent with BWR Owner's Group SRV Committee corrective action recommendations were installed during Refueling Outage (RO) 14. These modifications provide pressure switch SRV actuation as a second means of SRV actuation that is not susceptible to pilot disc-seat bonding.

EIIS Codes in [ ]

Event Description:

On June 19, 2001, while the plant was operating at 100 percent power, Engineering determined that two Safety Relief Valve (SRV) [SB] pilots removed during Cycle 14 had as-found setpoints in excess of the 1145 psig +/- 3 percent (i.e., 1111 to 1179 psig). The as-found allowed tolerance of 1145 psig +/- 3 percent is required per Technical Specification (TS) 4.6.E. Both SRVs exceeded the high limit of 1179 psig. One of the eleven pilots (serial 1047) was removed during Forced Outage (FO)145 in August 2000. The remaining ten were removed during RO14. The removed SRV pilots were tested at Wyle laboratories during June 6 through June 12, 2001. The results from these tests were reported to FitzPatrick by Wyle Laboratories on June 19, 2001.

Test Results:

Pilot Serial Number	Plant Valve Number	As-Found Setpoint	Pass/Fail (pass unless otherwise noted)
1062	02RV-71A	1147	
1088	02RV-71B	1268	Fail
1192	02RV-71C	1155	
1218	02RV-71D	1150	
1056	02RV-71E	1157	
1047	02RV-71F	1164	
1050	02RV-71G	1127	
1193	02RV-71H	1157	
1217	02RV-71J	1251	Fail
1194	02RV-71K	1152	
1196	02RV-71L	1161	

Technical Specification 3.6.E.1 only requires nine operable SRVs. The Specification states in part:

> *During reactor power operating conditions and prior to startup from a cold condition, or whenever reactor coolant pressure is greater than atmosphere and temperature greater than 212°F, the safety mode of at least 9 of 11 safety/relief valves shall be operable.*

Since only two pilot valves exceeded the allowable tolerance, the safety/relief mode of nine valves remained operable, satisfying this specification and assuring adequate overpressure protection in all cases.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
James A. FitzPatrick Nuclear Power Plant	05000333	01	05	00	3 OF 5

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

Event Description (continued):

Technical Specification Table 3.2-7, however, requires a reduction in the ATWS High Pressure setpoint trip from </= 1155 psig to </= 1120 psig with more than one SRV out of service (further discussed in Analysis, below). This setpoint remained at </= 1155 psig throughout the cycle, since the setpoint out-of-tolerance was not known until setpoint testing was performed. This report is therefore being made under 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications," due to the higher than allowable ATWS High Pressure setpoint trip given the number of inoperable SRVs.

Cause:

SRV setpoint drift is caused by 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. As 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.

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.

Analysis:

Two events are analyzed in determining the adequacy of overpressure protection; the limiting anticipated transient, MSIV Closure with Flux Scram; and the limiting unanticipated transient, the Pressure Regulator Failure Open (PRFO) with failure to scram (ATWS). The out-of-tolerance condition reported by this LER did not compromise overpressure protection for either analyzed event. The reported condition therefore is of minor safety significance.

The limiting anticipated transient, the MSIV Closure with Flux Scram, is analyzed as part of the Cycle Reload Analysis using conservative assumptions and setpoints. The SRV setpoints used for the Cycle 14 Reload Analysis were nine SRVs opening at 1195 psig, with two valves out of service. The as-found setpoints given above are less than those assumed (that is, nine SRVs opened at <1195 psig and the other two were not entirely out of service); therefore, the Cycle 14 Reload Analysis is bounding and further evaluation of the MSIV Closure with Flux Scram is not required. Further, the as found condition satisfies the Technical Specification 2.2.1.B Limiting Safety System setting requirements for SRVs, which are:

> *At least 9 of the 11 reactor coolant system safety/relief valves shall have a nominal setting of 1145 psig with an allowable setpoint error of +/-3 percent.*

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
James A. FitzPatrick Nuclear Power Plant	05000333	01	05	00	4 OF 5

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

Analysis (continued):

The limiting unanticipated transient, the Pressure Regulator Failure Open (PRFO) with failure to scram (ATWS), was analyzed in conjunction with the ELLLA (Extended Load Line Limit Analysis) project in GE-NE-A42-00137-2-01, ATWS Overpressure Analysis for FitzPatrick, dated March 2000. The ATWS analysis uses more nominal assumptions and setpoints, because the ATWS is not part of the plant design basis. The ELLLA analysis report lists eleven specific SRV setpoints used in the analysis. It also states that SRV out of service cases were analyzed by assuming the lowest setpoints from the list did not open. Using this methodology, satisfactory analytical results were obtained for limiting cases with two SRVs out of service and the ATWS High Pressure actuation setpoint at </= 1155 psig. The as-found setpoints given above are less than those assumed in the analysis; that is, the nine satisfactory SRV setpoints were all less than the third lowest setpoint used in the analysis (1170 psig), and the two out of tolerance SRVs were not entirely out of service. Therefore, the ELLLA ATWS Analysis is bounding and further evaluation of the PRFO ATWS is not required.

The above notwithstanding, Technical Specifications have not been revised consistent with this latest analysis. Thus, although current analysis demonstrates satisfactory results with zero, one, or two SRVs out of service and the ATWS High Pressure actuation setpoint at </= 1155 psig, Technical Specifications Table 3.2-7, Note 3 still states the following:

> *The ATWS Reactor Pressure High Recirculation Pump Trip setpoint shall be </= 1155 psig when either zero or one SRVs are out of service. The setpoint shall be </= 1120 psig when two or more SRVs are out of service.*

The failure of two SRVs therefore constitutes an "operation or condition which was prohibited by the plant's Technical Specifications."

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.

A BWROG recommended modification to provide pressure switch actuation of the SRVs was installed during RO14. 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 is not susceptible to pilot disc-seat bonding. As such, this modification will mitigate and limit the extent of condition to one part of a diverse SRV actuation methodology.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
James A. FitzPatrick Nuclear Power Plant	05000333	01	05	00	5 OF 5

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

Corrective Actions Ongoing Prior to this Report:

1. All 11 pilot assemblies were removed and replaced with steam certified assemblies.

2. All SRV pilot assemblies will continue to be tested and replaced each operating cycle.

3. A BWROG recommended modification to provide pressure switch actuation of the SRVs was installed during RO14.

Corrective Actions for this Event:

1. A Technical Specification change will be requested to incorporate the most current analysis into the Table 3.2-7 requirements for the ATWS Reactor Pressure High Recirculation Pump Trip setpoint.
   (Scheduled Completion Date: 09/30/01)

Safety System Functional Failure Review

This event did not result in a safety system functional failure in accordance with NEI 99-02, Revision 1.

Similar Events:

LERs 99-003, 98-002, 95-006 Revision 1, 95-001, 94-005, 94-002, 92-016, 90-018, 89-026, 88-010, 88-004, 87-004, 85-013, 85-009

Failed Component Identification:

Manufacturer:	Target Rock Corporation
Model Number:	7567F-10
NPRDS Manufacturer Code:	T020
NPRDS Component Code:	Valve

Reference:

1. GE-NE-A42-00137-2-01, "ATWS Overpressure Analysis for FitzPatrick," dated March, 2000