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June 28, 2002

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Operating License DPR-58
Docket No. 50-315

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

LER 315/2002-003-00: "Main Steam Safety Valves Exceeded Allowable Lift Setpoints"

No new commitments are identified in this submittal.

Should you have any questions regarding this correspondence, please contact Mr. Gordon P. Arent, Manager, Regulatory Affairs, at (616) 697-5553.

Sincerely,

A handwritten signature in black ink that reads "Joseph E. Pollock". The signature is written in a cursive style with a large initial "J".

Joseph E. Pollock
Site Vice President

INJ/pae

Attachment

c: G. P. Arent
A. C. Bakken
L. Brandon
K. D. Curry
J. E. Dyer, Region III
R. W. Gaston
S. A. Greenlee
T. P. Noonan
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NRC Resident Inspector
Records Center, INPO

IE22

LICENSEE EVENT REPORT (LER)

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

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 number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE
Main Steam Safety Valves Exceed Allowable Lift Setpoints

5. EVENT DATE			6. LER NUMBER				7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
05	03	2002	2002	-- 003 --	00	06	28	2002	FACILITY NAME	DOCKET NUMBER	

9. OPERATING MODE	1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)								
10. POWER LEVEL	52	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)					
		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 Specify in Abstract below or in NRC Form 366A					
		20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)						
		20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)						
		20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	X 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 I. N. Jackiw, Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) (616) 465-5901, x 1602
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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	Dresser	N					

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)

On May 2-3, 2002, with the unit at approximately 52% power, seven of twenty Main Steam Safety Valves (MSSVs) (EIS:SB,RV) failed to meet Technical Specifications (TS) required lift settings specified in TS 4.7.1.1, Table 4.7-1. TS 4.7.1.1 allows a +/- 3% tolerance on the as-found lift setting and requires all tested valves to be set to a +/- 1% as-left tolerance. Operations personnel entered the applicable TS Action Statement until each valve was adjusted and tested satisfactorily. In accordance with 10 CFR 50.73(a)(2)(i)(B), this condition is being reported as a condition prohibited by TS.

The cause of the test failures was attributed to metallic bonding between the valve disc and the nozzle. Adjustments were made and all of the "as-left" lift settings were within the +/- 1% acceptable range. No component was left outside of its acceptable range.

The MSSVs ensure that the secondary system pressure will be limited to within 110% of 1085 psig during the most severe anticipated system operational transient. The as-found test results of the seven valves discussed in this LER were still well below the 110% design pressure value. Thus, there is reasonable assurance that the valves were capable of performing their primary safety function as well as maintaining an adequate heat sink for the primary side. Therefore, this event is not considered safety significant since the valves in question would have performed their function.

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

Conditions Prior to Event

Unit 1 in Mode 1 at 52% power.

Description of Event

On May 2-3, 2002, with the unit at approximately 52% power, 7 of 20 Main Steam Safety Valves (MSSVs) failed to meet Technical Specification (TS) required lift setpoints specified in TS 4.7.1.1, Table 4.7-1. TS 4.7.1.1 allows a +/- 3% tolerance on the as-found lift setting and requires all valves be tested and be set to a +/- 1% as left tolerance. Operations personnel entered the applicable TS Action Statement until each valve was adjusted and tested satisfactorily. In accordance with 10 CFR 50.73(a)(2)(i)(B), this condition is being reported as a condition prohibited by TS.

The cause of the failures is attributed to metallic bonding between the valve disc and the nozzle. Industry experience has shown that oxide bonding between the disc and the nozzle can result in an increase in the lift setpoint.

Adjustments were made and all of the "as-left" lift settings were within the +/- 1% acceptable range. No component was left outside of its acceptable range.

Cause of Event

The cause of the MSSV failures was found to be oxide bonding between the stainless steel disc and the nozzle resulting in an increase in the valve's lift setpoint. All seven MSSV failures were characterized by a high initial lift setting followed by a much lower subsequent lift.

Analysis of Event

The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. These valves also provide protection against over-pressurizing the reactor coolant pressure boundary by providing a heat sink for the removal of energy from the reactor coolant if the preferred heat sink that is provided by the condenser (EHS:SD) is not available. The operability of the MSSVs ensures that the secondary system pressure will be limited to within 110% of its design pressure of 1085 psig during the most severe anticipated system operation transient.

A study was completed through a Tailored Collaboration effort between EPRI, Altran, South Texas Project, and several other plants experiencing similar high setpoint test failures with these valves (Dresser Model Number: 3707R). The resultant report reflects a culmination of a full one-year study (EPRI Report TR 113560). The study concluded that the valves stick due to metallic bonding between the disc and the nozzle resulting in an increase in the valve's setpoint. This phenomenon is characterized by MSSVs experiencing a high initial lift setting followed by satisfactory subsequent lift setting. The study further concluded that the use of pre-oxidized Inconel X-750 (X-750) discs is an effective way to reduce the sticking problem. The seven failures were:

- 1-SV-1A-4 failed at 1109 psig. The required setpoint is 1065 psig with an acceptable range of +/- 3% (1034 - 1096 psig);
- 1-SV-2B-4 failed at 1155 psig. The required setpoint is 1075 psig with an acceptable range of +/- 3% (1043 - 1107 psig);
- 1-SV-1B-4 failed at 1124 psig. The required setpoint is 1065 psig with an acceptable range of +/- 3% (1034 - 1096 psig);
- 1-SV-2A-2 failed at 1122 psig. The required setpoint is 1075 psig with an acceptable range of +/- 3% (1043 - 1107 psig);
- 1-SV-1B-3 failed at 1103 psig. The required setpoint is 1065 psig with an acceptable range of +/- 3% (1034 - 1096 psig);
- 1-SV-2B-1 failed at 1158 psig. The required setpoint is 1075 psig with an acceptable range of +/- 3% (1043 - 1107 psig);

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

1-SV-1B-1 failed at 1100 psig. The required setpoint is 1065 psig with an acceptable range of +/- 3% (1034 - 1096 psig).

The MSSVs ensure that the secondary system pressure will be limited to within 110% of 1085 psig during the most severe anticipated system operational transient. The as-found test results of the seven valves discussed in this LER were still well below the 110% design pressure value. Thus, there is reasonable assurance that the valves were capable of performing their primary safety function as well as maintaining an adequate heat sink for the primary side. Therefore, this event is not considered safety significant since the valves in question would have performed their function.

Corrective Actions

The seven failures discussed in this LER were apparently caused by metallic bonding between the stainless steel disc and the nozzle. Adjustments were made and all of the "as-left" lift settings were within the +/- 1% acceptable range. No component was left outside of its acceptable range. An on-going MSSV performance improvement program is in progress at D. C. Cook Nuclear Plant (CNP) which includes replacement of the original discs with pre-oxidized X-750 Inconel discs over a five-year period. Five of the seven valves which failed had their discs replaced with X-750 Inconel during the subsequent Unit 1 (U1C18) refueling outage. The remaining six valves on Unit 1 and twelve valves on Unit 2 will have their discs replaced during future refueling outages. This is being tracked as a NRC commitment. A review of previous metallic bonding events at CNP provides reasonable assurance that the valves will open within their safety function required range (110% design), thus allowing CNP to continue on its current five-year plan for replacement of all discs.

Previous Similar Events

As noted in the Analysis of Event section of this LER, numerous MSSV high setpoint test failure industry events were identified in a study completed through a Tailored Collaboration effort between EPRI, Altran, South Texas Project, and several other plants experiencing similar test failures with these valves (EPRI Report TR 113560). CNP has experienced numerous similar failures that may be attributed to metallic bonding.

LER 315/1997-004: MSSV was found to have exceeded its allowable setpoint.

LER 315/1995-002: MSSVs had lift setpoints above the TS allowed values.

LER 315/1994-001: Failure of MSSVs to meet TS lift setpoint requirements

LER 316/1994-003: Failure of MSSVs to meet TS lift setpoint requirements.

LER 315/1992-006: Failure of MSSVs to meet TS lift setpoint requirements.

LER 316/1992-003: Failure of MSSVs to meet TS lift setpoint requirements.

The as-found lift settings for these failures were well below the 110% design pressure value.