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10 CFR 50.73

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Calvert Cliffs Nuclear Power Plant
Facility Operating License No. DPR-53
Docket No. 50-317

Subject: Licensee Event Report 2014-003, Revision 00
Pressurizer Safety Valves As-Found Settings Outside Technical Specification Limits

The attached report is being sent to you as required by 10 CFR 50.73.

There are no regulatory commitments contained in this correspondence.

Should you have questions regarding this report, please contact Mr. Douglas E. Lauver at (410) 495-5219.

Respectfully,

Mark D. Flaherty
Plant General Manager

MDF/TJU/bjd

Attachment: Licensee Event Report 317/2014-003, Pressurizer Safety Valves As-Found Settings (Low) Outside Technical Specification Limits

cc: NRC Project Manager, Calvert Cliffs
NRC Regional Administrator, Region I
NRC Resident Inspector, Calvert Cliffs
S. Gray, MD-DNR

IE22
NRR

NRC FORM 366 (01-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Calvert Cliffs Nuclear Power Plant, Unit 1	05000 317	1 OF 6

4. TITLE

Pressurizer Safety Valves As-Found Settings (Low) Outside Technical Specification Limits Due To Inadequate Lift Spring Performance

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
02	28	2014	2014	- 003 -	00	04	24	2014		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*			
6	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☒ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
0	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
T. J. Unkle, Engineering Analyst	410-495-3698

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	AB	*RV*	*D243*	*Y*					

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

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

During scheduled testing at the offsite testing facility, the as-found lift settings for the pressurizer safety valves (PSVs) previously installed in Unit 1 at the 1RV200 and 1RV201 locations were measured outside the Technical Specification allowable values (both valves lifted low). The valves had been installed during the 2012 Unit 1 refueling outage and were removed during the 2014 Unit 1 refueling outage for scheduled testing and maintenance. Spare valves were installed during the 2014 refueling outage. The failed valves were disassembled and inspected at the offsite facility. The apparent cause of the PSV failures is that the internal lift spring assemblies of a specific manufacturer lot failed to hold PSV set pressure. This apparent cause will be verified as the removed internal lift spring assemblies for each valve is further reviewed, examined, and tested to support this apparent cause. No other installed PSVs contain internal lift spring assemblies from this specific manufacturer's lot.

NARRATIVE

I. DESCRIPTION OF EVENT:

A. PRE-EVENT PLANT CONDITIONS:

Unit 1 was in Mode 6 (Refueling) when the condition was discovered. The valves were not installed in the system when the condition was discovered.

B. EVENT:

In February 2014, Calvert Cliffs discovered during scheduled testing at the offsite testing facility that the as-found lift settings for the pressurizer safety valves (PSVs) previously installed in Unit 1 measured outside the limits specified in Technical Specification Surveillance Requirement (SR) 3.4.10.1. The valves had been installed at the 1RV200 and the 1RV201 locations and were removed during the 2014 Unit 1 refueling outage for scheduled testing and maintenance. On February 28, 2014, during as-found testing for PSV Serial Number BN04373 (previously installed at 1RV200 location) the valve opened at 2430 psia. The low end Technical Specification SR limit is 2475 psia. Also on February 28, 2014, during as-found testing for PSV Serial Number BM07952 (previously installed at 1RV201 location), the valve opened at 2400 psia. The low end Technical Specification SR limit for 1RV201 is 2514 psia.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

Unit 1 PSVs 1RV200 (BN04373) and 1RV201 (BM07952) were both determined to be inoperable. The inoperable condition for both valves provides the bases for this report.

D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

March 2012	BN04373 (1RV200) and BM07952 (1RV201) installed during the 2012 Unit 1 refueling outage.
February 2014	BN04373 (1RV200) and BM07952 (1RV201) removed during the 2014 Unit 1 refueling outage.
February 2014	BN04373 (1RV200) and BM07952 (1RV201) as-found lift tested at offsite vendor facility. As-found lift setting measured lower than Technical Specification allowable value. Both valves were disassembled, inspected, and each internal lift spring assembly replaced. Valve assembly and necessary adjustments were made. Each valve was as-left certified with three successful lifts. The post-test leak check was performed satisfactorily on each valve.

E. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

There were no other systems or secondary functions affected. This event is applicable to Calvert Cliffs, Unit 1 only.

F. METHOD OF DISCOVERY:

The condition was self-identified during scheduled testing at the offsite testing facility.

G. MAJOR OPERATOR ACTION:

No operator action was required for the subject valves. The valves were not installed in the plant when the condition was identified.

H. SAFETY SYSTEM RESPONSES:

No safety system responses were expected. None occurred.

II. CAUSE OF EVENT:

The event is documented in station condition report numbers CR-2014-002236 (1RV200) and CR-2014-002237 (1RV201).

The apparent cause of the PSV failures is that the internal lift spring assemblies of a specific manufacturer lot, failed to hold PSV set pressure. After this detailed inspection both valves were assembled and had any needed adjustments made. Both valves were as-left certified at their respective setpoints. The post-test leak check was performed satisfactorily for both valves.

The extent of condition review determined that the condition applied to 1RV200 (BN04373) and 1RV201 (BM07952). It was also determined a previously replaced PSV (2RV200, BN04375) that is not currently installed, is considered within this apparent cause. During the Extent of Condition review it was determined that the previously replaced PSV (2RV200, BN04375), had an internal lift spring assembly made from the same manufacturing spring lot. As a result this internal lift spring will also be examined. This continued examination will address all three internal lift springs in question from the specific spring lot. No other installed PSVs have an internal lift spring made from this same lot.

The apparent cause will be verified as the removed internal lift spring from each valve undergoes continued review and examination. Although not anticipated, should the continued review and examination result in a change to the apparent cause, a supplemental Licensee Event Report (LER) will be submitted.

III. ANALYSIS OF EVENT:

Each unit at Calvert Cliffs has two PSVs (1/2RV200 and 1/2RV201) designed to limit Reactor Coolant System (RCS) pressure to a maximum of 110 percent of design pressure (design pressure = 2500 psia). The Technical Specification defined setpoints for these valves are as follows:

Valve	As-Found Lift Setting (psia)	As-Left Lift Setting (psia)
1/2RV200	>/= 2475 and </= 2550	>/= 2475 and </= 2525
1/2RV201	>/= 2514 and </= 2616	>/= 2540 and </= 2590

The as-found setpoints are the limits for operability, i.e., if a valve lifts outside of those setpoints it is inoperable. Calvert Cliffs owns eight PSVs, four sets of two that are rotated between a specific location. The as-found lift setting for 1RV200 (BN04373) measured on February 28, 2014 was 2430 psia, which is lower than the Technical Specification SR allowed value of 2475 psia. The as-found lift setting for 1RV201 (BM07952) measured also on February 28, 2014 was 2400 psia, which is also lower than the Technical Specification SR allowed value of 2514 psia.

Both valves were refurbished at the offsite facility in 2010 and subsequently passed as-left acceptance testing prior to being installed during the 2012 refueling outage. While installed in the plant (March 2012-February 2014), there were no setpoint events associated with either valve. The valves were removed from their respective locations for scheduled testing and refurbishment in February 2014 during the Unit 1 refueling outage. Although an exact duration cannot be determined, it is reasonable to conclude that for some period of time while the valves were installed in the plant, most likely their lift settings were not within the Technical Specification SR defined setpoint limit. With one PSV inoperable, the Technical Specification Condition 3.4.10.A Required Action is to restore the valve to operable status within a 15 minute Completion Time. If this required action cannot be met, or if two PSVs are inoperable, Technical Specification Condition 3.4.10.B requires the plant to be placed in Mode 3 within 6 hours and to reduce all RCS cold leg temperatures to </= 365 F (Unit 1) within 12 hours. The failure to recognize and meet the requirements of Technical Specification Condition 3.4.10.B also should have required entry into Technical Specification LCO 3.0.3. We believe that the subject condition (for one or both of the PSVs) existed longer than the Technical Specification Completion Times for the associated Required Actions. Therefore, this event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B).

This event is also evaluated as a single condition that caused two independent trains or channels to become inoperable in a single system. Each PSV is independent of the other and they are both part of the reactor coolant system overpressure protection system. So, they meet the criteria to be considered independent trains in a single system. Since the apparent cause of the inoperability is the installation of the same internal lift spring assemblies of a specific manufacturer lot in each valve that is a common cause for the inoperability of the PSVs. Therefore, this event is reportable in accordance with 10 CFR 50.73(a)(2)(vii).

There were no actual nuclear safety consequences incurred from this event. For some time, while installed, both 1RV200 and 1RV201 were susceptible to an early lift. Realizing that if challenged, the valves could have lifted at a time different than assumed in the applicable safety analyses, the Calvert Cliffs Updated Final Safety Analysis Report (UFSAR) was reviewed and a probabilistic risk assessment analysis was performed.

The probabilistic risk assessment analysis determined that the estimated increase in core damage frequency was less than 1E-07 and the estimated increase in large early release frequency was less than 1E-08 per year for the subject condition. The deviations in relief valve setpoints would have no significant impact as they would still perform the function modeled in the probabilistic risk assessment. This issue would be "GREEN" using the NRC's Significance Determination Process.

The Calvert Cliffs UFSAR was reviewed to evaluate the design basis events impacted by a decreased lift setting for both 1RV200 and for 1RV201. The evaluation determined that the results presented in the UFSAR were bounding for all impacted design basis events. In all cases, overpressure protection of the RCS was maintained. Therefore, the condition of 1RV200 and 1RV201 would not have prevented the system from fulfilling its safety function.

This event has no impact on the Nuclear Regulatory Commission Reactor Oversight Process Performance Indicators.

IV. CORRECTIVE ACTIONS:

A. ACTION TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

A reasonable expectation of continued operability was completed for the valves currently installed in Unit 2 and the valves installed in Unit 1 during the Unit 1 2014 refueling outage. The degraded valves have been refurbished and will be tested prior to reinstallation in the plant. As scheduled, spare valves were installed during the 2014 Unit 1 refueling outage.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

1. The apparent cause will be verified as the valve lift spring from each valve (3 total) is further reviewed, examined, and tested. Based on the findings from this testing any discrepancy identified must be captured in the appropriate related document(s) (i.e., design and/or procurement specification) to prevent repeat performance issues associated with these valve lift springs.

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NARRATIVE

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

The subject valves are American Society of Mechanical Engineers Boiler and Pressure Code approved PSVs designed to limit RCS pressure to a maximum of 110 percent of design pressure. The safety valves are totally enclosed, back pressure compensatory, spring-loaded valves. The valves are manufactured by Dresser Consolidated, Inc. (EPIX Identification number D243). The valves affected by the subject condition are 1RV200 (BN04373) and 1RV201 (BM07952).

B. PREVIOUS LERS ON SIMILAR EVENTS:

A review of Calvert Cliffs' events over the past several years was performed. Although no previous Calvert Cliffs occurrences were identified involving PSVs outside Technical Specification limits due to the internal lift spring assembly, the site has had several instances of PSV set point testing (low and high) abnormalities.

The following LER's are identified from this review:

LER 317/2008-002-Set Point (high) failure-cause identified as excessive drift which resulted in degradation of internal components that move when spring is actuated.

LER 317/2010-002-Set Point (low and high) failure on 2 separate valves-identified as normal set point variations.

LER 318/2011-002-Set Point (high) failure-cause identified as greater than expected set point variation, License Amendment Request submitted to expand the allowable set point range.

LER 318/2013-002-Set Point (high) failure-cause identified as inadequate margin, awaiting approval of License Amendment Request.

C. THE ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) COMPONENT FUNCTION IDENTIFIER AND SYSTEM NAME OF EACH COMPONENT OR SYSTEM REFERRED TO IN THIS LER:

COMPONENT	IEEE 803 FUNCTION ID	IEEE 805 SYSTEM ID
Pressurizer Safety Valves	RV	AB
Pressurizer	PZR	AB

D. SPECIAL COMMENTS:

None.