Calvert Cliffs Nuclear Power Plant

1650 Calvert Cliffs Parkway
Lusby, Maryland 20657

CENG
SM
a joint venture of
Constellation Energy
EDF

CALVERT CLIFFS
NUCLEAR POWER PLANT

February 2, 2012

U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit No. 2; Docket No. 50-318; License No. DPR 69
Licensee Event Report 2011-002, Revision 01
Pressurizer Safety Valve Setpoint High Due to Setpoint Variation

The attached report is being sent to you as required by 10 CFR 50.73. Should you have questions regarding this report, please contact Mr. Douglas E. Lauver at (410) 495-5219.

Very truly yours,

Christopher R. Costanzo
Plant General Manager

CRC/CAN/bjd

Attachment: As stated

cc: D. V. Pickett, NRC
W. M. Dean, NRC
Resident Inspector, NRC
S. Gray, DNR

IE22
NRR

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Calvert Cliffs Nuclear Power Plant, Unit 2	05000 318	1 OF 05

4. TITLE

Pressurizer Safety Valve Setpoint High Due to Setpoint Variation

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
										05000
07	07	2011	2011	- 002 -	01	02	00	2012	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

99.5

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

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
C.A. Neyman, Senior Engineering Analyst	410-495-3507

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
X	AB	RV	D243	Y					

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 July 7, 2011, a reportable condition was determined to have existed at Calvert Cliffs Nuclear Power Plant. On March 11, 2009, during scheduled testing at an offsite testing facility, the as-found lift setting for pressurizer safety valve, serial number BS03213, was measured higher than the Technical Specification allowable value. However, test results were submitted to Calvert Cliffs stating that the as-found test was successful. The valve had been installed in Unit 2 at the 2RV201 location (Unit 2 pressurizer safety valve) and was removed during the 2009 Unit 2 refueling outage for scheduled testing and maintenance. No material conditions were found that contributed to the high setpoint discovered during the test. The apparent cause is a greater than expected setpoint variation. The currently installed valves are operable. The corrective action is to increase the Technical Specification setpoint tolerance. A similar event is documented in Licensee Event Report 317/2010-002. The cause for that event was setpoint variation.

I. DESCRIPTION OF EVENT

A. PRE-EVENT PLANT CONDITIONS

Unit 2 was operating at 99.5 percent of rated thermal power on July 7, 2011.

B. EVENT

On July 7, 2011, a reportable condition was determined to have existed. On March 11, 2009, during scheduled testing at the offsite testing facility, the as-found lift setting for pressurizer safety valve (PSV) Serial Number BS03213 was measured higher than the Technical Specification allowable value. The valve had been installed in Unit 2 at the 2RV201 location (Unit 2 PSV) and was removed during the 2009 Unit 2 refueling outage for scheduled testing and maintenance. The valve was subsequently disassembled and inspected by the vendor. The valve was refurbished, reassembled, and as-left testing was performed on the valve with no issues noted. The apparent cause of BS03213 lifting high was a greater than expected setpoint variation.

All valves currently installed in Units 1 and 2 were verified to be set properly.

Because this condition is isolated to one serial number for a Unit 2 PSV, this licensee event report (LER) is applicable to Calvert Cliffs Nuclear Power Plant Unit 2 only.

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

Unit 2 PSV BS03213 was determined to be inoperable while it had been installed in the plant. That inoperable condition is the basis for this report. The extent of condition review determined that the condition applied to BS03213 (2RV201) only.

D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

March 2007	BS03213 installed during the 2007 Unit 2 refueling outage.
March 2009	BS03213 removed during the 2009 Unit 2 refueling outage.
March 11, 2009	BS03213 as-found lift tested at offsite vendor facility. As-found lift setting measured higher than Technical Specification allowable value but not recognized as outside of Technical Specifications.
March 2010	BS03213 disassembled, inspected, and refurbished at offsite vendor facility. As-left testing was performed with no issues noted.
February 2011	BS03213 test results recognized as not meeting procedure criteria.
July 2011	Reportable condition was determined to have existed.
November 2011	The apparent cause of BS03213 lifting high was determined to be a greater than expected setpoint variation.

E. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED

No other systems or secondary functions were affected.

F. METHOD OF DISCOVERY

Following as-found lift testing at an offsite facility, a report, prepared by the inspector who witnessed the test, indicated that BS03213 lifted within an assumed requirement of 2550 psig +/- 3 percent, which is a typical industry tolerance. However, the acceptable range in accordance with Technical Specifications was actually 2550 psig +/- 2 percent. This condition was identified during a review of the surveillance test data in February 2011. In July 2011, this condition was evaluated under apparent cause evaluation CR-2011-001263. The reportable nature of this condition was determined during review of CR-2011-001263. To prevent future delays in identifying potential issues with the PSVs, the procurement specification has been revised to require the inspector to expeditiously notify Calvert Cliffs if the as-found setpoint value is outside of the Technical Specification limits.

G. MAJOR OPERATOR ACTION

No major operator actions were taken as a result of this condition.

H. SAFETY SYSTEM RESPONSES

There were no demands for safety system actuations during this event. The condition was discovered after the component was removed from the system.

II. CAUSE OF EVENT:

The apparent cause of BS03213 lifting high was a greater than expected variation in the setpoint. There was no material condition identified during refurbishment of BS03213 which would indicate that the valve was assembled incorrectly or was degraded. Over the last three as-found tests for BS03213, the setpoint was determined to be higher than the initial setting. This phenomenon of setpoint variation is well-documented for its effect on safety valves. It is generally termed "variance" and is a typical response for a PSV. This variation has typically been addressed by setting the as-left pressure of the PSV at -0.5 to 0 percent of the nominal PSV setpoint. This allows an approximately 2 to 2.5 percent variation. This was the case with BS03213. It was set at an as-left setpoint of -0.47 percent of the nominal setpoint. The variation during this cycle of operation was higher than expected. Historically, the average variation for a PSV in this application at Calvert Cliffs is 1.68 percent. The setpoint variation over the cycle for BS03213 was 2.52 percent.

III. ANALYSIS OF THE EVENT:

Each Unit at Calvert Cliffs Nuclear Power Plant 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 (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 Technical Specification Bases state that 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.

BS03213 was installed at 2RV201 location in March 2007 and removed from the plant in March 2009. The as-found lift setting for BS03213 measured on March 11, 2009 was 2617 psia. This is higher than the Technical Specification Surveillance Requirement (SR) allowed value of 2616 psia. The apparent cause (documented in Condition Report Number CR-2011-008397) was a greater than expected setpoint variation. The valve was disassembled and refurbished. No material condition was identified during refurbishment of BS03213 which would indicate that the valve was assembled incorrectly or was degraded. The valve subsequently passed the as-left testing.

With these test results, it is reasonable to conclude that for some period of time while BS03213 was installed in the plant, the lift setting was not within the Technical Specification Surveillance Requirement defined setpoint limit. With one PSV inoperable, the Technical Specification Limiting Condition for Operation (LCO) 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, Technical Specification LCO 3.4.10.B requires the plant to be placed in Mode 3 within 6 hours and to reduce all Reactor Coolant System cold leg temperatures to </= 365 F (Unit 1) or </= 301 F (Unit 2) within 12 hours. The subject condition 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). The failure to meet the requirements of Technical Specification LCO 3.4.10 also would have required entry into Technical Specification LCO 3.0.3.

There were no actual nuclear safety consequences incurred from this event. Two PSVs (2RV200 and 2RV201) are located on the Unit 2 pressurizer to provide overpressure protection of the RCS. Only one of the PSVs was affected by the subject condition. BS03213 should have been considered inoperable for some period of time while installed during the applicable modes. While installed (2007-2009), BS03213 was susceptible to lifting later than assumed in the safety analyses. Realizing that the valve could have lifted late if challenged, a probabilistic risk assessment analysis was performed. The risk assessment determined that the estimated increase in core damage frequency and the estimated increase in large early release frequency are negligible for the subject condition.

IV. CORRECTIVE ACTIONS:

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

1. BS03213 internal components were inspected and refurbished.
2. As-left testing of the refurbished valve was performed.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE

1. To account for the potential magnitude of setpoint variation, we plan to submit a License Amendment Request to revise Technical Specification 3.4.10 to change the PSVs as-found setpoint tolerance.

V. ADDITIONAL INFORMATION

A. FAILED COMPONENTS:

The PSV is an American Society of Mechanical Engineers Boiler and Pressure Vessel Code approved PSV designed to limit RCS pressure to a maximum of 110 percent of design pressure. The PSV is a totally enclosed, back pressure compensated, spring-loaded valve. The valve is manufactured by Dresser Consolidated, Inc. (component manufacturer number D243). The valve affected by the subject condition is BS03213.

B. PREVIOUS LERs ON SIMILAR EVENTS

A review of Calvert Cliffs' events over the past several years was performed. A previous LER documented a similar event that occurred on Unit 1 in 2010 and was reported in LER 317/2010-002. In that event, no material conditions were present that caused the valves to lift outside of specifications. The affected valves were refurbished and retested.

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 EIIS Function	IEEE 805 System ID
Pressurizer Safety Valves	RV	AB
Pressurizer	PZR	AB

D. SPECIAL COMMENTS

None