Calvert Cliffs Nuclear Power Plant

1650 Calvert Cliffs Parkway
Lusby, Maryland 20657

CENG
a joint venture of
Constellation Energy · EDF

CALVERT CLIFFS
NUCLEAR POWER PLANT

April 18, 2013

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 2013-001, Revision 00
Reactor Coolant System Pressure Boundary Leakage in Valve Leakoff Line Weld

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,

Mark D. Flaherty
Plant General Manager

MDF/CAN/bjd

Attachment: As stated

cc: N. S. Morgan, 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
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4. TITLE

Reactor Coolant System Pressure Boundary Leakage in Valve Leakoff Line Weld

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR		DOCKET NUMBER
										05000
02	17	2013	2013	- 001 -	00	04	18	2013	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE

3

10. POWER LEVEL

0

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

☐ 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)
☐ 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)
☐ 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)	☐ OTHER
☐ 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)
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
B	AB	PCV	I208	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 February 17, 2013, while Unit 2 was in Mode 3 during a refueling outage, a pinhole leak was identified at the upper packing leakoff line cap seal weld of pressurizer spray valve 2CV-100F, which constituted a Reactor Coolant System pressure boundary leak. The Technical Specifications limit Reactor Coolant System pressure boundary leakage to zero. Based on visual inspection performed during the boric acid walkdown the leak most likely existed during plant operation. The most likely cause of the pinhole was a latent weld defect created during the installation of the cap seal weld. A similar event is documented in Licensee Event Report 318/2010-002. The most likely cause for that event was a latent weld defect created during manufacture. The valve bonnet assembly, which includes the packing leakoff line, was replaced and inspected satisfactorily prior to startup from the Unit 2 refueling outage.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
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I. DESCRIPTION OF EVENT:

A. PRE-EVENT PLANT CONDITIONS:

Unit 2 was in Mode 3 (Hot Standby) when the condition was discovered.

B. EVENT:

On February 17, 2013, while Unit 2 was in Mode 3 during a refueling outage, a pinhole leak was identified at the upper packing leakoff line cap seal weld of valve 2CV-100F (pressurizer spray valve), which constituted a Reactor Coolant System (RCS) pressure boundary leak.

The Technical Specifications limit RCS pressure boundary leakage to zero. The leak was identified during the Mode 3 boric acid walkdown. The leakoff line was located below the valve packing. Therefore, per Technical Specification definition, the pinhole leak constituted an RCS pressure boundary leak.

Based on visual inspection performed during the boric acid walkdown, the leak most likely existed during plant operation. Based on a review of the maintenance history and discussions with experienced Calvert Cliffs' personnel, the most likely cause of the pinhole was a latent weld defect created when performing the cap seal weld. The valve bonnet assembly, which includes the packing leakoff line, was replaced and inspected satisfactorily prior to startup from the Unit 2 refueling outage.

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

There were no inoperable structures, components, or systems that contributed to the event.

D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

02/17/2013 At 1345, during Mode 3 boric acid walkdown per the boric acid corrosion control program, an active boric acid leak was identified at valve 2CV-100F.

02/17/2013 At 1551, event number 48763 immediate (four and eight hour) notification report submitted pursuant to 10 CFR 50.72(b)(3)(ii)(A) (degraded condition) and 10 CFR 50.72(b)(2)(i) (Plant Shutdown Required by Technical Specifications).

02/17/2013 At 2259, Unit 2 entered Mode 5 and exited the Technical Specification action statement.

03/13/2013 Replaced valve bonnet assembly.

03/23/2013 At normal operating temperature and pressure, verified no leakage existed on the valve upper packing leakoff line.

E. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

There were no other systems or secondary functions affected. This event is applicable to Calvert Cliffs Nuclear Power Plant, Unit 2 only.

F. METHOD OF DISCOVERY:

Visual inspection during the Mode 3 boric acid walkdown identified an active boric acid leak at the valve. The pinhole was located at the packing leakoff line cap seal weld.

G. MAJOR OPERATOR ACTION:

There were no major operator actions. At the time of discovery, the unit was shut down for a refueling outage.

H. SAFETY SYSTEM RESPONSES:

No safety system responses were expected. None occurred.

II. CAUSE OF EVENT:

The event is documented in station condition report number CR-2013-001245. Based on boric acid walkdown visual inspection data, the leak most likely existed during plant operation. Based on discussions with Calvert Cliffs' personnel, the most likely cause of the pinhole was a latent weld defect created when performing the cap seal weld.

III. ANALYSIS OF EVENT:

The Technical Specifications for RCS operational leakage (Technical Specification Limiting Condition for Operation 3.4.13.a) limits pressure boundary leakage to zero. If any RCS operational pressure boundary leakage exists, the Technical Specifications require the operating Unit to be in Mode 3 within 6 hours and to be in Mode 5 within 36 hours. Based on review of boric acid walkdown data the leak most likely existed during operation for a time longer than allowed by the Technical Specification. Therefore, this condition is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

As stated earlier, the failure was most likely due to a latent weld defect created during the installation of the cap seal weld. Since the failure may have occurred due to a material problem that resulted in abnormal degradation of a principal safety barrier (i.e., it was necessary to take corrective actions to restore the barrier's capability), this event is also reportable pursuant to 10 CFR 50.73(a)(2)(ii)(A).

This event did not result in any actual nuclear safety consequences. The RCS pressure boundary leakage was contained within the Containment Building and did not interface with any other systems. Unidentified RCS pressure boundary leakage remained within Technical Specification limits during the time the pressure boundary leak may have existed (i.e., during the period of applicability after startup from the spring 2011 Refueling Outage, until the leak was repaired in March 2013, approximately two years maximum).

Due to the leak rate of approximately one drop per minute that was noted when the leak was identified, there was no impact on the Reactor Coolant System Leakage performance indicator. The performance indicator remained green.

From a qualitative perspective, there was no significant increase in core damage frequency or large early release frequency due to the RCS pressure boundary leak. The leak was extremely small for the duration that the condition existed. The leakoff line hole size is within the capacity of the charging pumps.

If additional information is subsequently developed that would significantly affect the understanding of this event, a supplemental licensee event report will be submitted.

IV. CORRECTIVE ACTIONS:

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

1. The valve bonnet assembly, which includes the packing leakoff line, was replaced.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

1. We plan to delete the valve leakoff lines from pressurizer spray valve bonnet assemblies.

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

2CV-100F pressurizer spray valve.

B. PREVIOUS LERS ON SIMILAR EVENTS:

A review of Calvert Cliffs' events over the past several years was performed. One previous Calvert Cliffs occurrence was identified involving an RCS pressure boundary leak due to failure of a valve leakoff line weld. This was reported to the NRC in 2010 in Licensee Event Report 318/2010-002. The subject valve was a manual valve of a different design than 2CV-100F. Following the 2010 event, all required inspections were performed. The leak on 2CV-100F did not exist during a subsequent inservice inspection walkdown in 2011.

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
2CV-100F pressurizer spray valve	PCV	AB

D. SPECIAL COMMENTS:

None.