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**CALVERT CLIFFS
NUCLEAR POWER PLANT**

June 21, 2013

U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit No. 1; Docket No. 50-317; License No. DPR 53
Licensee Event Report 2012-003, Revision 01
Plant Shutdown Completed due to Control Element Assembly Misalignment

The attached supplemental 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

*JE22
MRR*

LICENSEE EVENT REPORT (LER)

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

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.

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4. TITLE
Plant Shutdown Completed due to Control Element Assembly Misalignment

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	
08	12	2012	2012	- 003 -	01	06	21	2013	05000	
									FACILITY NAME	
									DOCKET NUMBER	
									05000	

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)							
	Specify in Abstract below or in NRC Form 366A									

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Craig A. Neyman, Licensing Engineer	TELEPHONE NUMBER (Include Area Code) 410-495-3507
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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
X	AA	CL	W120	Y					

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO				MONTH	DAY	YEAR

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

On August 12, 2012, shutdown group Control Element Assembly (CEA) 9 dropped to the fully inserted position. At the time of the event, Unit 1 was operating at 100 percent rated thermal power and no planned CEA motions were in progress. Operators entered applicable Technical Specification Action Statements for the dropped CEA. It was identified that the CEA alignment could not be restored within the required completion time and operators entered Action Statement 3.1.4.F, which required the unit to be in Mode 3 within 6 hours. Operators began the Technical Specification required unit shutdown at 1425. Unit 1 entered Mode 3, Hot Standby, at 1959 on August 12, 2012 and Mode 5, Cold Shutdown, at 1257 on August 13, 2012. The CEA dropped due to the failure of the Control Element Drive Mechanism (CEDM) upper gripper coil. The upper gripper coil failed due to an internal short circuit most likely caused by overheating. The most probable cause is degradation in the CEDM cooling system. A contributing cause is potential low margin in the CEDM cooling system. Corrective actions include replacement of the CEDM coil stack, adjusting holding voltage, testing to identify coil degradation, and review of CEDM cooling system operation. The unit was returned to full power at 1630 on August 18, 2012. No previous occurrences were identified involving a unit shutdown due to a dropped CEA.

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I. DESCRIPTION OF EVENT:

A. PRE-EVENT PLANT CONDITIONS:

On August 12, 2012, Unit 1 was operating at 100 percent rated thermal power. There were no inoperable systems, structures, or components that would have impacted this event.

B. EVENT:

On August 12, 2012, a condition was identified that resulted in a plant shutdown required by Technical Specifications. At 1234, shutdown group Control Element Assembly (CEA) 9 dropped to the fully inserted position. At the time of the event, no planned CEA motions were in progress. Operators stabilized reactor power at 87 percent and entered the following Technical Specification Action Statements:

- 3.1.4.B for CEA alignment
- 3.1.5.B for one shutdown CEA withdrawn less than 121.5 inches
- 3.2.4.A for azimuthal power tilt
- 3.4.1.A for Reactor Coolant System pressure, temperature, and flow departure from nucleate boiling.

Operators discovered that the Control Element Drive Mechanism (CEDM) power supply breaker for CEA 9 had tripped open. In an attempt to recover the dropped CEA, one attempt was made to reclose the breaker. Additional troubleshooting revealed low resistance in the upper gripper coil, indicating an internal short circuit. It was determined that the CEA alignment could not be restored within the required completion time and operators entered Action Statement 3.1.4.F, which thereafter, required the unit to be in Mode 3 within 6 hours. Operators began the Technical Specification required unit shutdown at 1425. Unit 1 entered Mode 3 at 1959 on August 12, 2012 and Mode 5 at 1257 on August 13, 2012. Following replacement of the failed coil, the unit was returned to full power at 1630 on August 18, 2012.

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

The dropped CEA resulted in entering applicable Technical Specification Action Statements. Operators then entered Action Statements 3.1.4.F and 3.1.5.C when it was determined the CEA alignment could not be restored. This resulted in a Technical Specification required unit shutdown for repairs.

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D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

August 12, 2012

1234 – Shutdown group CEA 9 dropped to the fully inserted position. Operations entered Technical Specification Action Statements for one CEA trippable and misaligned from its group by greater than 15 inches. Operators also implemented Abnormal Operating Procedure (AOP)-1B, CEA Malfunction.

1253 – Reactor power stabilized at 87percent.

1425 – Commenced unit shutdown.

1959 – Placed the unit in Mode 3. Exited applicable Technical Specification Action Statements for CEA misalignment. Exited AOP-1B.

August 13, 2012

0200 – Troubleshooting identified a CEDM coil failure. Commenced cool down to Mode 5.

1257 – Placed the unit in Mode 5.

August 14, 2012

2210 – Following repairs, commenced unit heat up.

August 18, 2012

1630 - Unit 1 returned to 100 percent reactor power.

E. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

No other systems or secondary functions were affected by this event.

F. METHOD OF DISCOVERY:

The event was self-revealing.

G. MAJOR OPERATOR ACTION:

When it was determined that the CEA could not be realigned with its group within the time required by Technical Specifications, operators placed the unit in Mode 3, Hot Standby. Operators subsequently placed the unit in Mode 5, Cold Shutdown, to facilitate repairs. Following repairs, Operators began unit startup and returned the unit to full power on August 18, 2012.

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H. SAFETY SYSTEM RESPONSES:

There were no demands for safety system actuations during this event.

II. CAUSE OF EVENT:

This event is documented in the site's Corrective Action Program under CR-2012-010826. The CEDM upper gripper coil for CEA 9 failed. Upper gripper coil resistance was 2.5 ohms, indicating an internal short circuit in the coil. The average resistance value for all other CEDM upper gripper coils was 7.2 ohms. The internal short circuit was most likely caused by **overheating. The most probable cause is degradation in the CEDM cooling system. A contributing cause is potential low margin in the CEDM cooling system.**

III. ANALYSIS OF EVENT:

This event is reportable in accordance with the following:

10 CFR 50.73(a)(2)(i)(A) - "The completion of any nuclear plant shutdown required by the plant's Technical Specifications."

Operators completed the Technical Specification required shutdown on August 12, 2012 which meant it is reportable under 10 CFR 50.73(a)(2)(i)(A).

This event did not result in any actual nuclear safety consequences. The CEA drop event is analyzed in Section 14.11 of the Calvert Cliffs' Updated Final Safety Analysis Report. The most limiting CEA drop event is an uncontrolled CEA insertion at hot full power. The event is bounded by the Section 14.11 safety analysis.

The risk associated with the CEA drop event is considered to have a relatively low impact. While the probabilistic risk assessment does not model the failure likelihood of a single dropped CEA, the failure could be a precursor to a plant trip. A plant trip has a Conditional Core Damage Probability of 6.6E-07 and a Conditional Large Release Probability of 2.8E-08. A dropped CEA is considered to be within the bounds of a plant trip. As a result, the risk associated with this event is considered small and is not significant from a probabilistic risk assessment perspective.

This event has limited impact on the Nuclear Regulatory Commission Reactor Oversight Process Performance Indicators for Unit 1. The performance indicator for Unplanned Power Changes per 7000 Critical Hours is projected to rise by 1 and remain low in the green band.

IV. CORRECTIVE ACTIONS:

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

The affected CEDM coil stack was replaced.

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B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

1. Review CEDM performance during periodic on-line testing for indications of coil degradation, and to address margin.
2. Completed evaluation on vendor report on failed coil to verify cause.
3. Reduce holding and stepping voltages back to 35 and 135 VDC respectively to add margin.
4. Create Preventive Maintenance tasks to periodically inspect the CEDM cooler inlet dampers.

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

The CEDM upper gripper coil was supplied by Westinghouse Electric Corporation, model N0100.

B. PREVIOUS LERS ON SIMILAR EVENTS:

A review of Calvert Cliffs' events over the past several years was performed. No previous occurrences were identified involving a unit shutdown due to a dropped CEA.

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
CEDM Upper Gripper Coil CEDM Cooling System	CL CLR	AA CD

D. SPECIAL COMMENTS:

None.