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10 CFR 50.73

June 7, 2018

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

Calvert Cliffs Nuclear Power Plant, Units No. 1 and 2  
Renewed Facility Operating License Nos. DPR-53 and DPR-69  
NRC Docket Nos. 50-317 and 50-318


Subject: Licensee Event Report 2018-002, Revision 00  
Items Non-Conforming to Design for Tornado Missile Protection

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. Larry D. Smith at (410) 495-5219.

Respectfully,

  
JAKE SMITH  
for Todd A. Tierney  
Plant Manager

TAT/PSF/bjm

Attachment: As stated

cc: NRC Project Manager, Calvert Cliffs  
NRC Regional Administrator, Region I

NRC Resident Inspector, Calvert Cliffs  
S. Gray, MD-DNR

IE22  
NRR



**LICENSEE EVENT REPORT (LER)**

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto: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.

<b>1. Facility Name</b> Calvert Cliffs Nuclear Power Plant, Unit 1	<b>2. Docket Number</b> 05000317	<b>3. Page</b> 1 OF 4
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**4. Title**  
Items Non-Conforming to Design for Tornado Missile Protection

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
05	14	2018	2018	002	00	06	07	2018	Calvert Cliffs Nuclear Power Plant Unit 2	05000 318
									Facility Name	Docket Number
										05000

**9. Operating Mode**      **11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)**

1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)

**10. Power Level**

100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)

50.73(a)(2)(i)(C)       Other (Specify in Abstract below or in NRC Form 366A)

**12. Licensee Contact for this LER**

<b>Licensee Contact</b> Patricia Furio, Principal Regulatory Engineer	<b>Telephone Number (Include Area Code)</b> 410-495-4374
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**13. Complete One Line for each Component Failure Described in this Report**

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
N/A					N/A				

<b>14. Supplemental Report Expected</b> <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No	<b>15. Expected Submission Date</b>	Month	Day	Year
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**Abstract** (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On May 14, 2018, Calvert Cliffs Nuclear Power Plant determined that the Saltwater subsystems on both Units 1 and 2 do not conform with the licensing basis for protection against a tornado generated missile. The Saltwater system header is vulnerable to a tornado missile that enters the Intake Structure through the watertight door, IS-2. An extent of condition review did not identify any additional items that are non-conforming to the design basis for a tornado missile. Upon determination of the initial non-conformance for the Saltwater system subsystems, both Saltwater subsystems were declared inoperable for both Units. Compensatory measures were put in place and verified. Therefore, in accordance with the NRC Enforcement Guidance Memorandum EGM 15-002, both Saltwater system subsystems were returned to operable but non-conforming status and an 8-hour ENS Notification was made to the NRC. This condition has been in existence since original licensing of the plant. It is not known if it was overlooked or considered acceptable at the time of the original licensing process. There are no actual consequences as a result of the non-conforming condition.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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1. FACILITY NAME  Calvert Cliffs Nuclear Power Plant Unit 1	2. DOCKET NUMBER  05000317	3. LER NUMBER		
		YEAR  2018	SEQUENTIAL NUMBER  - 002	REV NO.  - 00
NARRATIVE				

**PLANT AND SYSTEM IDENTIFICATION**

Calvert Cliffs Nuclear Power Plant, Units 1 and 2, are Combustion Engineering Pressurized Water Reactors with a licensed maximum power level of 2737 megawatts thermal. The Energy Industry Identification System codes used in the text are identified as [XX].

**A. CONDITION PRIOR TO EVENT**

Units 1/2  
Date: May 14, 2018  
Power level: 100 percent/100 percent  
Mode: 1/1

There were no structures, systems, or components (SSCs) out-of-service that contributed to this event.

**B. DESCRIPTION OF EVENT**


On May 14, 2018 during evaluation of protection for Technical Specification equipment from the damaging effects of a tornado generated missile, it was determined that a non-conforming condition exists with the Saltwater [BS] System subsystem piping [PSP] with respect to tornado missile protection. Specifically, since a tornado generated missile could strike Saltwater system subsystem piping on either Unit, the design does not meet the licensing basis and a non-conforming condition exists.

This condition was entered into the corrective action program (separate entries for each Unit) and the NRC was notified via Event Notification 53401 on May 14, 2018.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specification; 10 CFR 50.73(a)(2)(ii)(B) as an event or condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety; 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of the safety function of SSCs that are needed to mitigate the consequences of an accident, and 10 CFR 50.73(a)(2)(vii) as an event where a single cause or condition caused two independent trains to become inoperable in a single system.

**C. CAUSE OF EVENT**

This condition was part of the original plant design and has existed since the initial construction and licensing of the plant. Calvert Cliffs Unit 1 received its initial operating license on July 31, 1974 and Calvert Cliffs Unit 2 received its initial operating license on August 13, 1976, based in part on the design as described in the Final Safety Analysis Report (FSAR). The cause of the non-conforming condition is a legacy design issue that was identified as part of the response to Regulatory Information Summary 2015-06, "Tornado Missile Protection."

<b>NRC FORM 366A</b> (04-2018)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>APPROVED BY OMB: NO. 3150-0104</b>		<b>EXPIRES: 03/31/2020</b>	
 <b>LICENSEE EVENT REPORT (LER) CONTINUATION SHEET</b> (See NUREG-1022, R.3 for instruction and guidance for completing this form <a href="http://www.nrc.gov/reading-m/doc-collections/nuregs/staff/sr1022/r3/">http://www.nrc.gov/reading-m/doc-collections/nuregs/staff/sr1022/r3/</a> )		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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to <a href="mailto:Infocollects.Resource@nrc.gov">Infocollects.Resource@nrc.gov</a> , 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.					
		<b>1. FACILITY NAME</b> Calvert Cliffs Nuclear Power Plant Unit 1		<b>2. DOCKET NUMBER</b> 05000317		<b>3. LER NUMBER</b>	
				<b>YEAR</b> 2018	<b>SEQUENTIAL NUMBER</b> - 002	<b>REV NO.</b> - 00	
<b>NARRATIVE</b>							

#### D. SAFETY ANALYSIS

There are no actual consequences resulting from this identified non-conforming condition. A tornado that could produce the design basis missile is highly unlikely in the mid-Atlantic region. The probability of a design basis missile striking the Saltwater System subsystem piping in a fashion to render the SSC inoperable is also very low.

The FSAR described characteristics of the design basis tornado wind hazard and tornado generated missile hazard. These design requirements are stated as:

- “Differential bursting pressure between the inside and outside of the containment structure is assumed to be 3 pounds per square inch positive pressure.
- Lateral force is assumed as the force caused by a tornado funnel having a peripheral tangential velocity of 300 mph and a forward progression of 60 mph. The provisions for gust factors and variation of wind velocity with height do not apply.
- A tornado driven missile equivalent to a 4000 pound automobile flying through the air at 50 mph and at not more than 25 feet above the ground or a 4 inch by 12 inch by 12 foot long piece of wood traveling end-on at 300 mph at any height.”

NRC Enforcement Guidance Memorandum, EGM 15-002, Revision 1, provides for the application of NRC enforcement discretion which allows the identified non-conforming conditions on each Unit to be returned to an operable status based on the application of compensatory measures which are intended to reduce the likelihood that the tornado event would result in a failure of the Saltwater system subsystem on either Unit. Calvert Cliffs has applied the guidance in EGM 15-002, Revision 1 and NRC DSS-ISG-2016-01, Revision 1, Appendix A to determine the acceptable initial compensatory measures necessary to ensure that the identified non-conforming condition could be treated by the NRC with enforcement discretion.

#### E. CORRECTIVE ACTIONS

Compensatory measures were implemented in accordance with NRC guidance contained in EGM 15-002 (revision 1) and DSS-ISG-2016-01 (revision 1) as described earlier. Enforcement discretion provided by EGM 15-002 remains in effect until June 10, 2020 for Calvert Cliffs, at which time modifications, analysis, license amendments, or other actions must be implemented to fully resolve the issue.

#### F. PREVIOUS OCCURRENCES

No previous similar events have occurred at the site within the last 5 years.



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**G. COMPONENT FAILURE DATA**

No component failures were identified.