



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 16, 2015

LICENSEE: Exelon Generation, LLC

FACILITY: Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NOS. 1 AND 2 -  
SUMMARY OF AUGUST 20, 2015, MEETING WITH EXELON GENERATION  
COMPANY, LLC, REGARDING CHEMICAL EFFECTS TESTING FOR  
RESOLUTION OF GENERIC LETTER 2004-02, "POTENTIAL IMPACT OF  
DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN  
BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS" (TAC NOS.  
MC4672 AND MC4673)

On August 20, 2015, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Exelon Generation, LLC, (the licensee) at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss chemical effects testing and the closure approach for the resolution of Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors" for the Calvert Cliffs Nuclear Power Plant (Calvert Cliffs). The meeting notice and agenda, dated August 10, 2015, is available in the Agencywide Documents Access and Management System (ADAMS) Accession No. ML15222B179. A list of attendees is provided as Enclosure 1.

The licensee presented information regarding the status of their chemical effects head loss experiment (CHLE) testing, and a discussion of a simplified risk-informed closure plan to resolve GL 2004-02. The licensee's slides can be viewed at ADAMS Accession No. ML15222A547.

The licensee presented information on the status of their CHLE testing that had been conducted at Alden Laboratories. This testing began in April of 2015, but was terminated approximately five hours into the test due to head loss increases. Multiple subsequent head loss tests and debris bed analysis were conducted in order to find the cause of the head loss. The licensee attributed the head loss increase to particulate migration from test materials to the vertical loop detector bed. Based on the results of these tests, the licensee determined it would stop the testing program, and pursue a simplified risk-informed closure plan for GL 2004-02.

The simplified risk-informed approach involves identifying applicable strainer head loss tests with chemical effects to determine the largest pipe break bounded by deterministic analysis, and then using probabilistic risk analysis (PRA) to evaluate those breaks outside the deterministic analysis.

The NRC staff noted that the licensee had provided very limited information regarding the tests being used to evaluate strainer head loss. The staff stated that the licensee would need to justify assumptions made regarding debris size tested, and why certain chemical effects tests were selected.

The licensee then presented information on refined debris generation, as well as strainer head loss testing. The debris size distribution, as well as the insulation densities, and debris quantities were discussed. The licensee discussed results from several strainer head loss tests, and noted that they concluded testing which included small pieces of fiber is non-conservative for their plant. Therefore, the licensee is only considering tests conducted with fine fibrous debris in the evaluation of strainer head loss. The licensee reported that tests using only fine fibrous debris showed break-throughs during each test, which is a typical response for the strainer. The licensee also presented a strainer head loss correlation that shows a relationship between fiber mass and head loss.

The NRC staff queried the licensee on whether or not there would be a large build-up of debris in front of the strainers in the plant. The staff also asked about the removal of mineral wool from the plant, and from the tests. Finally, the staff stated that it would simplify the licensee's evaluation and the staff review if the licensee did not use a correlation to evaluate strainer head loss.

The licensee explained that there would be a similar build-up of debris in front of the strainers in the plant, as the test facility was designed to mirror conditions in the plant. In addition, the licensee explained that since mineral wool was a big contributor of aluminum, an attempt was made to remove the mineral wool from containment.

The licensee and the NRC staff then jointly discussed potential concerns, issues, and questions. Some of the topics discussed included justification for the data and assumptions used by the licensee, timing of the risk-informed submittal, the risk-informed methodology to be used, and results of the tests already run by the licensee.

The licensee and the NRC staff concluded the meeting by discussing the path forward for the licensee's resolution of GL 2004-02. The NRC staff will have internal discussions to determine if a site audit at Calvert Cliffs would be beneficial. If the staff does not have a site audit, another public meeting at NRC headquarters will be arranged.

Members of the public were in attendance. Public Meeting Feedback forms were not received, and no feedback from the public was received. No members of the public made any comments during the meeting.

Please direct any inquiries to me at 301-415-2549, or Alexander.Chereskin@nrc.gov.

A handwritten signature in black ink, appearing to read "Alex Chereskin". The signature is fluid and cursive, with the first name "Alex" and the last name "Chereskin" clearly distinguishable.

Alexander N. Chereskin, Project Manager  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosure:  
List of Attendees

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LIST OF ATTENDEES

AUGUST 20, 2015, MEETING WITH EXELON GENERATION, LLC TO  
DISCUSS CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1, AND 2  
CHEMICAL EFFECTS TESTING FOR GL 2004-02 RESOLUTION

**U.S. Nuclear Regulatory Commission**

A. Chereskin  
S. Smith  
M. Yoder  
P. Klein  
M. Diaz-Colon  
L. Robinson  
A. Obodoako  
A. Russell\*

**Exelon Generation, LLC, and Contractors**

C. Sellers  
M. Gahan  
S. Kinsey  
K. Greene  
A. Drake

**Members of the Public**

Ron Holloway\*  
Bradley Tyers\*  
Paul Leonard\*

\*via teleconference

Enclosure

Please direct any inquiries to me at 301-415-2549, or alexander.chereskin@nrc.gov.

*/RA/*

Alexander N. Chereskin, Project Manager  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

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J. Stang, NRR

**ADAMS Accession Nos.: PKG: ML15238A428**

**Meeting Notice: ML15222B179**

**Meeting Summary: ML15237A106**

**Handouts: ML15222A547**

OFFICE	NRR/DORL/LPLI-1/PM	NRR/DORL/LPLI-1/LA	NRR/DSS/SSIB
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OFFICE	NRR/DE/ESGB	NRR/DORL/LPLI-1/BC	NRR/DORL/LPLI-1/PM
NAME	GKulesa	BBeasley	AChereskin
DATE	8/31/2015	9/16/2015	9/16/2015

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