



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

March 9, 2017

To Those on the Attached List

**SUBJECT:     GENERIC LETTER 2016-01, "MONITORING OF NEUTRON-ABSORBING  
                  MATERIALS IN SPENT FUEL POOLS" – LICENSEE-REPORTED  
                  CATEGORY 3 PLANTS**

On April 7, 2016, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2016-01, "Monitoring of Neutron-Absorbing Materials in Spent Fuel Pools" (Agencywide Documents Access and Management System Accession No. ML16097A169), to address the degradation of neutron-absorbing materials (NAMs) in wet storage systems for reactor fuel at power and non-power reactors.

GL 2016-01 requested that licensees provide information to allow the NRC staff to verify continued compliance through effective monitoring to identify and mitigate any degradation or deformation of NAMs credited for criticality control in spent fuel pools.

To facilitate each licensee's response, GL 2016-01 established four categories (Category 1, Category 2, Category 3, and Category 4). Categories 1, 2, and 3 identify situations where a detailed response to the GL 2016-01 would not be required. The categorization criteria were generally based on if a licensee does not credit NAMs for criticality control, or if a licensee's NAM monitoring program has been incorporated in the licensing basis by an NRC-approved technical specification (TS) change or license condition. A full description of the categories can be found in Enclosure 1.

Enclosure 2 provides a list of GL 2016-01 responses where the licensee reported the plants as meeting Category 3. The NRC staff has completed its review of the responses associated with GL 2016-01 for the plants referenced in Enclosure 2. The NRC staff performed a thorough review of each licensee's response, any documents referenced therein, and other applicable licensing basis documents. The NRC staff review determined that the licensees listed in Enclosure 2 credit NAMs for criticality control and have established NAM monitoring programs. However, the NRC staff review also determined that the NAM monitoring programs have not been incorporated into the licensing basis through an NRC-approved TS change or license condition. Therefore, the NRC staff reviewed the previously docketed information referenced in the responses to determine if it contained the information consistent with an acceptable Category 4 response. The NRC staff has separated the plants into Enclosure 3 or Enclosure 4 based on the submitted and reviewed information.

For the power reactor facilities listed in Enclosure 3, the NRC staff review determined that previously docketed information sufficiently addressed the five areas of information described in Appendix A to GL 2016-01. Additionally, the NRC staff found that the licensee intends to continue monitoring the condition of their neutron-absorbing materials as described in Enclosure 3. Based on the review of the information provided, the NRC staff concludes no further information or action is requested regarding GL 2016-01 for those plants listed in Enclosure 3.

For the power reactor facilities listed in Enclosure 4, the NRC staff review determined that previously-docketed information does not sufficiently address the five areas of information described in Appendix A to GL 2016-01. To complete its review, the NRC staff requests the licensees provide the specific areas of information associated with Appendix A to GL 2016-01, as listed in Enclosure 4. Enclosure 4 also documents when the NRC staff discussed with each licensee the schedule for providing supplemental information, and the date each licensee agreed to provide the information. Provide the written response to the NRC in accordance with the guidance provided in GL 2016-01. Any questions about this matter may be directed to the technical contact listed in GL 2016-01.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas A. Broaddus". The signature is fluid and cursive, with a large initial "D" and "B".

Douglas A. Broaddus, Chief  
Special Projects and Process Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Enclosures:

1. List of GL 2016-01 Categories
2. List of Plants, Licensee-Reported Categories, Incoming Letters, and CAC numbers
3. List of Plants, License Renewal Application or License Amendment, and Testing Frequency
4. List of Plants, License Renewal Application or License Amendment NAMs, and Requested Information

cc: Listserv

LETTER TO THOSE ON THE ATTACHED LIST DATED MARCH 9, 2017

SUBJECT: GENERIC LETTER 2016-01, "MONITORING OF NEUTRON-ABSORBING MATERIALS IN SPENT FUEL POOLS" – LICENSEE-REPORTED CATEGORY 3 PLANTS

Braidwood Station, Units 1 and 2  
Exelon Generation Company, LLC  
Docket Nos. STN 50-456 and STN 50-457  
License Nos. NPF-72 and NPF-77

Mr. Bryan C. Hanson  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer (CNO)  
Exelon Nuclear  
Braidwood Station  
4300 Winfield Road  
Warrenville, IL 60555

Byron Station, Units 1 and 2  
Exelon Generation Company, LLC  
Docket Nos. STN 50-454 and STN 50-455  
License Nos. NPF-37 and NPF-66

Mr. Bryan C. Hanson  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer (CNO)  
Exelon Nuclear  
Byron Station  
4300 Winfield Road  
Warrenville, IL 60555

Calvert Cliffs Nuclear Power Plant, Unit 1  
Exelon Generation Company, LLC  
Docket No. 50-317  
License No. DPR-53

Mr. Bryan C. Hanson  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

Columbia Generating Station  
Energy Northwest  
Docket No. 50-397  
License No. NPF-21

Mr. Mark E. Reddemann  
Chief Executive Officer  
Energy Northwest  
P.O. Box 968 (Mail Drop 1023)  
Richland, WA 99352-0968

Hope Creek Generating Station  
PSEG Nuclear, LLC  
Docket No. 50-354  
License No. NPF-57

Mr. Peter P. Sena, III  
President and Chief Nuclear Officer  
PSEG Nuclear LLC – N09  
Hope Creek Generating Station  
P.O. Box 236  
Hancocks Bridge, NJ 08038

LaSalle County Station, Units 1 and 2  
Exelon Generation Company, LLC  
Docket Nos. 50-373 and 50-374  
License Nos. NPF-11 and NPF-18

Mr. Bryan C. Hanson  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer (CNO)  
Exelon Nuclear  
LaSalle County Station  
4300 Winfield Road  
Warrenville, IL 60555

Limerick Generating Station, Units 1 and 2

Exelon Generation Company, LLC  
Docket Nos. 50-352 and 50-353  
License Nos. NPF-39 and NPF-85

Mr. Bryan C. Hanson  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

Nine Mile Point Nuclear Station, Unit 1

Exelon Generation Company, LLC  
Docket No. 50-220  
License No. DPR-63

Mr. Bryan C. Hanson  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

Oyster Creek Nuclear Generating Station

Exelon Generation Company, LLC  
Docket No. 50-219  
License No. DPR-16

Mr. Bryan C. Hanson  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

Peach Bottom Atomic Power Station, Units 2  
and 3

Exelon Generation Company, LLC  
Docket Nos. 50-277 and 50-278  
License Nos. DPR-44 and DPR-56

Mr. Bryan C. Hanson  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

Salem Nuclear Generating Station, Units 1  
and 2

PSEG Nuclear, LLC  
Docket Nos. 50-272 and 50-311  
License Nos. DPR-70 and DPR-75

Mr. Peter P. Sena, III  
President and Chief Nuclear Officer  
PSEG Nuclear LLC – N09  
Salem Nuclear Generating Station  
P.O. Box 236  
Hancocks Bridge, NJ 08038

## LIST OF GL 2016-01 CATEGORIES

- Category 1: Power reactor addressees that do not credit neutron-absorbing materials other than soluble boron in the analysis of record (AOR). In some cases, no neutron-absorbing material is present in the spent fuel storage racks, and in other cases, credit for the neutron-absorbing material has been removed through a regulatory action (e.g., approved license amendment). Those addressees may submit a response letter confirming that no neutron-absorbing materials are currently credited to meet NRC subcriticality requirements in the spent fuel pool (SFP).
- Category 2: Power reactor addressees that have an approved license amendment to remove credit for existing neutron-absorbing materials and that intend to complete full implementation no later than 24 months after the issuance of this GL. Licensees may request extensions to this implementation timeframe if there are extenuating circumstances. Those addressees may submit a response letter affirming that they will implement the approved license amendment request within the specified time. However, they must still provide information equivalent to Category 3 or Category 4 for any other neutron-absorbing material credited in the SFP criticality AOR after the license amendment has been fully implemented.
- Category 3: Power reactor addressees that have incorporated their neutron-absorbing material monitoring programs into their licensing basis through an NRC-approved Technical specification (TS) change or license condition. Those addressees may submit a response letter referencing their approved TS change or license condition and affirming that no change has been made to their neutron-absorbing material monitoring program, as described in the referenced license amendment request. If a change has been made since NRC approval of the reference, the response letter should also describe any such changes. (Licensees with a monitoring program approved as part of a license amendment request or license renewal application that was not incorporated as a TS change or license condition are considered to belong in Category 4.)
- Category 4: All other power reactor addressees. The NRC seeks information in five areas depending upon the type of neutron absorber material used by the licensee in the SFP.

**LIST OF PLANTS, CATEGORIES, INCOMING LETTERS, AND CAC NUMBERS**

<b>Plant</b>	<b>Licensee-Reported Category</b>	<b>Incoming Letter (ADAMS Accession No.)</b>	<b>CAC Nos.</b>
Braidwood Station, Units 1 and 2	3	ML16308A470	MF8667, MF8668
Byron Station, Units 1 and 2	3	ML16308A470	MF8674, MF8675
Calvert Cliffs Nuclear Power Plant, Unit 1	3	ML16308A470	MF8677
Columbia Generating Station	3	ML16245A899	MF8682
Hope Creek Generating Station	3	ML16305A238	MF8649
LaSalle County Station, Units 1 and 2	3	ML16308A470	MF8645, MF8646
Limerick Generating Station, Units 1 and 2	3	ML16308A335	MF8643, MF8644
Nine Mile Point Nuclear Station, Unit 1	3	ML16308A470	MF8637
Peach Bottom Atomic Power Station, Units 2 and 3	3	ML16308A470	MF8624, MF8625
Oyster Creek Nuclear Generating Station	3	ML16308A470	MF8630
Salem Nuclear Generating Station, Units 1 and 2	3	ML16305A241	MF8610, MF8611

**LIST OF PLANTS, LICENSE RENEWAL APPLICATION OR LICENSE AMENDMENT, AND TESTING FREQUENCY**

The licensees listed in the below table have provided an adequate description of an effective monitoring program, as part of the license renewal or license amendment documentation referenced in their response to GL 2016-01. All monitoring programs include the following key features:

- Neutron attenuation testing of coupons.
- Established processes to ensure that the licensee will take the appropriate corrective actions if any potentially non-conforming material is discovered.
- A testing frequency, as stated in the below table.
- Acceptance criteria to ensure maintenance of the 5-percent sub-criticality margin for the spent fuel pool.

<b>Plant</b>	<b>License Renewal Application or License Amendment (ADAMS Accession No.)</b>	<b>Testing Frequency</b>
Braidwood Station, Units 1 and 2	ML13161A223	At least once every 10 years
Byron Station, Units 1 and 2	ML13161A223	At least once every 10 years
Hope Creek Generating Station	ML092430374	At least once prior to the period of extended operation, and then at least once in the first 10 years of the period of extended operation.
LaSalle County Station, Units 1 and 2	ML14343A840	At least once every 10 years
Limerick Generating Station, Units 1 and 2	ML11179A101	At least once every 10 years
Peach Bottom Atomic Power Station, Units 2 and 3	ML13114A929	Two coupons every 6 months for the "Fast Start" program, and at least 2 coupons every 2 years for the first 10 years of the program, and at least 2 coupons every 4 years after 10 years of acceptable performance
Salem Nuclear Generating Station, Units 1 and 2	ML092400531	At least once every 2 years for the first 3 inspections periods, then at least once every 6 years afterwards

**LIST OF PLANTS, LICENSE RENEWAL APPLICATION OR LICENSE  
AMENDMENT, NAMs, AND REQUESTED INFORMATION**

<b>Plant</b>	<b>License Renewal Application or License Amendment (ADAMS Accession No.)</b>	<b>Neutron Absorber Material</b>	<b>Requested Information (Items described in Appendix A of GL 2016-01)</b>	<b>Conference Call Date</b>	<b>Agreed Date Supplement to Be Provided</b>
Calvert Cliffs Nuclear Power Plant, Unit 1	ML041040129 ML082180478	Carborundum	<ul style="list-style-type: none"> <li>• 1.a, b, e</li> <li>• 2.a.v, 2.b.i-ii</li> <li>• 3</li> <li>• 4.a, c, d</li> <li>• 5 (all)</li> </ul>	February 22, 2017	April 28, 2017
Columbia Generating Station	ML102440342	Tetrabor	<ul style="list-style-type: none"> <li>• 2.b.iv</li> <li>• 3</li> <li>• 4.b, c</li> <li>• 5 (all)</li> </ul>	March 2, 2017	May 2, 2017
Nine Mile Point Nuclear Station, Unit 1	ML041490213 ML062890129 ML062890236	Boraflex	<ul style="list-style-type: none"> <li>• 1</li> <li>• 2.a, 2.b.iii, 2.b.iv</li> <li>• 3</li> <li>• 4 (all)</li> <li>• 5 (all)</li> </ul>	February 22, 2017	April 28, 2017
Oyster Creek Nuclear Generating Station	ML053050477 ML071290023 ML071310246	Boraflex	<ul style="list-style-type: none"> <li>• 1.b, 1.c, 1.d.ii, 1.e</li> <li>• 2.a, 2.b.iii, 2.b.iv</li> <li>• 4.a (for localized effects), b, c</li> <li>• 5 (all)</li> </ul>	February 22, 2017	April 28, 2017



SUBJECT: GENERIC LETTER 2016-01, "MONITORING OF NEUTRON-ABSORBING MATERIALS IN SPENT FUEL POOLS" – LICENSEE-REPORTED CATEGORY 3 PLANTS DATED MARCH 9, 2017.

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| RidsNrrDorLpl4 Resource         | RidsNrrPMNineMilePoint Resource |
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| RidsNrrPMByron Resource         | RTaylor, NRR                    |
| RidsNrrPMCalvertCliffs Resource | SKrepel, NRR                    |

**ADAMS Accession No.: ML17041A369**

**\*via email**

OFFICE	NRR/DORL/LSPB/PM	NRR/DORL/LSPB/LA	NRR/DE/ESGB/BC(A)*
NAME	SWall	JBurkhardt	AJohnson
DATE	3/06/17	3/03/17	3/06/17
OFFICE	NRR/DPR/PGCB/BC*	NRR/DSS/SNPB/BC*	NRR/DORL/LSPB/BC
NAME	SStuchell	RLukes	DBroaddus
DATE	3/06/17	3/06/17	3/09/17

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