

## **NRR-PMDAPEm Resource**

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**From:** Purnell, Blake  
**Sent:** Friday, March 03, 2017 8:38 AM  
**To:** Hanson, Stephanie J.:(GenCo-Nuc) (Stephanie.Hanson@exeloncorp.com)  
**Cc:** Barstow, James:(GenCo-Nuc); Navratil, Gene J:(GenCo-Nuc); Green, Kimberly  
**Subject:** Exelon Generation Company, LLC - Request for Additional Information Regarding Fleet Alternative to RPV Threads in Flange Examination (CAC Nos. MF8712-MF8729)  
**Attachments:** MF8712 Exelon RR Flange Threads RAI.pdf

Ms. Hanson:

By application dated October 31, 2016 (Agencywide Documents Access and Management System Accession No. ML16306A270), Exelon Generation Company, LLC (the licensee) submitted a request in accordance with Paragraph 50.55a(z)(1) of Title 10 of the Code of Federal Regulations (10 CFR) for a proposed alternative to the requirements of 10 CFR 50.55a and the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME BPV Code) for Braidwood Station, Units 1 and 2; Byron Station, Unit Nos. 1 and 2; Calvert Cliffs Nuclear Power Plant, Units 1 and 2; Dresden Nuclear Power Station, Units 2 and 3; Limerick Generating Station, Units 1 and 2; Nine Mile Point Nuclear Station, Units 1 and 2; Peach Bottom Atomic Power Station, Units 2 and 3; Quad Cities Nuclear Power Station, Units 1 and 2; R. E. Ginna Nuclear Power Plant; and Three Mile Island Nuclear Station, Unit 1. The proposed alternative would allow the licensee to not perform the examination of reactor pressure vessel threads in the flange required ASME BPV Code, Section XI, Examination Category B-G-1, Item Number B6.40 for the remainder of the current 10-year inservice inspection interval for each facility.

The U.S. Nuclear Regulatory Commission staff has reviewed the application and determined that the additional information is needed for the staff to complete its review. Provide a response to the attached request for additional within 30 days. If you have any questions, please contact me at 301-415-1380.

Sincerely,

Blake Purnell, Project Manager  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission

Docket Nos. STN 50-456, STN 50-457, STN 50-454,  
STN 50-455, 50-317, 50-318, 50-237,  
50-249, 50-352, 50-353, 50-220, 50-410,  
50-277, 50-278, 50-254, 50-265, 50-244,  
and 50-289

**Hearing Identifier:** NRR\_PMDA  
**Email Number:** 3380

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**Subject:** Exelon Generation Company, LLC - Request for Additional Information  
Regarding Fleet Alternative to RPV Threads in Flange Examination (CAC Nos. MF8712-MF8729)  
**Sent Date:** 3/3/2017 8:38:24 AM  
**Received Date:** 3/3/2017 8:38:00 AM  
**From:** Purnell, Blake

**Created By:** Blake.Purnell@nrc.gov

**Recipients:**

"Barstow, James:(GenCo-Nuc)" <James.Barstow@exeloncorp.com>

Tracking Status: None

"Navratil, Gene J:(GenCo-Nuc)" <Gene.Navratil@exeloncorp.com>

Tracking Status: None

"Green, Kimberly" <Kimberly.Green@nrc.gov>

Tracking Status: None

"Hanson, Stephanie J.:(GenCo-Nuc) (Stephanie.Hanson@exeloncorp.com)"

<Stephanie.Hanson@exeloncorp.com>

Tracking Status: None

**Post Office:**

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	1906	3/3/2017 8:38:00 AM
MF8712 Exelon RR Flange Threads RAI.pdf		110687

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

REQUEST FOR ADDITIONAL INFORMATION  
PROPOSED ALTERNATIVE TO  
REACTOR PRESSURE VESSEL THREADS IN FLANGE EXAMINATION  
BRAIDWOOD STATION, UNITS 1 AND 2;  
BYRON STATION, UNIT NOS. 1 AND 2;  
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2;  
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3;  
LIMERICK GENERATING STATION, UNITS 1 AND 2;  
NINE MILE POINT NUCLEAR STATION, UNITS 1 AND 2;  
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3;  
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2;  
R.E. GINNA NUCLEAR POWER PLANT; AND  
THREE MILE ISLAND NUCLEAR STATION, UNIT 1.  
EXELON GENERATION COMPANY, LLC  
DOCKET NOS. STN 50-456, STN 50-457, STN 50-454, STN 50-455, 50-317, 50-318,  
50-237, 50-249, 50-352, 50-353, 50-220, 50-410,  
50-277, 50-278, 50-254, 50-265, 50-244, AND 50-289

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The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the application and determined that the following information is needed for the staff to complete its review.

**RAI-1**

The application states (Attachment, pages 2–3) that the geometric parameters for a typical pressurized-water reactor (PWR) design was selected for analysis. However, Exelon is requesting the proposed alternative for both PWR and boiling-water reactor (BWR) designs. Explain how the PWR thread geometry used in the analysis bounds or is representative of the BWR thread geometry for the Exelon fleet. The thread geometry consists of the pitch (number of threads per inch) and depth of a thread (distance from crest to root).

**RAI-2**

Table 2 in the attachment to the application shows values for the applied stress intensity factor ( $K_I$ ) for two load cases:

- (1) "Preload," which occurs at the temperature the bolt preload is applied, and
- (2) "Preload + Heatup + Pressure," which occurs at high or operating temperature.

However, the application provided a comparison of  $K_I$  with the allowable value ( $K_{IC}/\sqrt{10}$ ) only for the "Preload + Heatup + Pressure" case.  $K_{IC}$  is defined to be the material fracture toughness of the RPV flange that contains the bolt hole threads. The NRC staff has observed that the "Preload" case could be more limiting than the "Preload + Heatup + Pressure" case because: (1) the value of  $K_{IC}$  is expected to be lower at the temperature the bolt preload is applied, and (2) most of the applied  $K_I$  comes from the "Preload" case.

Provide a comparison of  $K_I$  with  $K_{IC}/\sqrt{10}$  for the "Preload" case for the most limiting threads in RPV flange of the 18 units listed in the application. The most limiting threads are those threads in the RPV flange whose applied  $K_I$  from the "Preload" case in Table 2 is closest to the plant-specific value of  $K_{IC}/\sqrt{10}$ .