



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

May 25, 2011

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2 – UNACCEPTABLE WITH  
OPPORTUNITY TO SUPPLEMENT RE: RELIEF REQUEST I3R-08,  
ALTERNATIVE REQUIREMENTS TO ASME CODE REQUIREMENTS FOR  
CLASS 1 PRESSURE RETAINING WELDS (TAC NOS. ME6024 AND ME6025)

Dear Mr. Pacilio:

By letter dated April 11, 2011, Exelon Generation Company, LLC (EDG, the licensee) submitted to the U.S. Nuclear Regulatory Commission (NRC) relief request (RR) I3R-08, inservice examinations at Braidwood Station, Units 1 and 2, for review and approval. The purpose of this letter is to provide the results of the NRC staff's acceptance review of RR I3R-08. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Pursuant to Sections 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR), the applicant shall demonstrate that the proposed alternatives would provide an acceptable level of quality and safety, or that compliance with the specified requirements of Section 50.55a would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

The NRC staff has reviewed your application and concluded that the information delineated in the enclosure to this letter is necessary to enable the NRC staff to make an independent assessment regarding the acceptability of the proposed RR in terms of regulatory requirements and the protection of public health and safety and the environment.

In order to make the application complete, the NRC staff requests that EGC supplement the application to address the information requested in the enclosure by June 6, 2011. This will enable the NRC staff to begin its detailed technical review. If the information responsive to the NRC staff's request is not received by the above date, the application will not be accepted for review pursuant to 10 CFR 2.101, and the NRC will cease its review activities associated with the application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the staff's detailed technical review by separate correspondence.

The information requested and associated timeframe in this letter were discussed with Lisa Schofield of your staff on May 24, 2011.

M. Pacilio

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If you have any questions, please contact the Project Manager, Nicholas DiFrancesco, at (301) 415-1115.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas DiFrancesco". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Nicholas DiFrancesco, Project Manager  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-456 and 50-457

Enclosure:  
As stated

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SUPPLEMENTAL INFORMATION REQUEST

RELIEF REQUEST I3R-08

EXELON GENERATION COMPANY, LLC

BRAIDWOOD, UNIT NOS. 1 AND 2

DOCKET NOS. 50-456 AND 50-457

By letter dated April 11, 2011, Exelon Generation Company, LLC (EGC, the licensee), submitted for the U.S. Nuclear Regulatory Commission (NRC) relief request (RR) I3R-08, inservice examinations at Braidwood Station, Units 1 and 2, for review and approval (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111020263). Specifically, the licensee proposed an alternative to the American Society of Mechanical Engineers (ASME) Section XI, Appendix VIII, Supplement 2 (austenitic to austenitic welds), and 10 (dissimilar metal welds (DMW)) depth sizing acceptance root mean square (RMS) error performance demonstration requirements. The NRC staff finds the RR I3R-08 unacceptable with opportunity to supplement additional information supporting the request. The NRC staff requests the following supplement information to be provided prior to a decision on the acceptability.

1. The request was submitted in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i). At a public meeting dated November 30-December 1, 2010, the NRC gave a presentation titled, "NRC Request for Dissimilar Metal Weld Performance Demonstration Data on ID [inside diameter] Depth Sizing Error," (ADAMS Accession No. ML103400206). The presentation stated that an RR should be based on impracticality (10 CFR 50.55a(g)(5)(iii)).
  - (a) Please change the 10 CFR reference accordingly to 10 CFR 50.55a(g)(5)(iii).
  - (b) Provide the necessary information to support a request for impracticality.
  - (c) Since the Mechanical Stress Improvement Process is performed from the outside Diameter (OD), include a discussion on accessibility of the subject welds for depth sizing cracks from the OD surface using state-of-the-art, Appendix VIII, qualified ultrasonic (UT) test techniques.
2. The request states that "EGC contacted the Electric Power Research Institute (EPRI) NDE Center on February 7, 2011, and confirmed that no vendor has successfully demonstrated compliance with the Code . . ." At a public meeting dated December 2 and 3, 2008, the NRC gave a presentation titled, "NRC Perspectives on Inside Diameter Pipe Examinations Depth Sizing Root Mean Square Error," (ADAMS Accession Nos. ML090760523 (memo) and ML090760695 (presentation)) with conclusions and recommendations for demonstrating RMS error depth sizing by licensees and vendors. At a public meeting dated May 27 and 28, 2009, the EPRI-Performance Demonstration Initiative (PDI) identified the differences between the test sets used for successful qualifications from the OD and unsuccessful qualifications from the inside diameter (ID) surfaces (ADAMS Accession Nos. ML091760056 (memo), and ML091590560

Enclosure

(presentation)). Currently, the PDI program does not have or considered assembling from other programs test sets with conditions similar to test sets used for depth sizing qualification from the OD.

- (a) Provide a discussion on the last time the UT vendor participated in an Appendix VIII, Supplement 2 or 10, ID performance demonstration and any future scheduled Appendix VIII, Supplement 2 and 10, or other (non-Appendix VIII) future programs involving ID performance demonstrations.
  - (b) Provide a discussion on the time and effort necessary to secure mockups for site-specific vendor ID RMS error demonstrations.
  - (c) Provide a discussion on the availability of mockups for future outages at Braidwood Station, Units 1 and 2.
3. Licensees have located representative mockups (smooth ID surfaces similar to their welds) containing cracks within the industry. The UT vendors have used these mockups to demonstrate ID depth sizing RMS error capabilities. Also, vendors have independently participated in blind and non-blind round robin demonstrations on mockups containing representative cracks.
  - (a) Provide a discussion of EGC's effort to provide representative mockups containing cracks (or simulated cracks with crack like responses) with ID surfaces similar to the surfaces used for successful OD depth sizing qualifications.
  - (b) Provide a discussion of your vendor's participation in ID depth sizing demonstration that may have been independent of the PDI program. If available, include a description of the specimens (ID surface waviness, configurations, and materials) and cracks, type of tests (blind or non-blind), differences between the procedures and personnel used for the demonstrations and those being proposed for examining the subject welds, summary of results and RMS values, and the organization sponsoring or proctoring the demonstrations.
4. Starting in 2004 (ADAMS Accession No. ML050690198), EPRI has requested licensees to make surface profilometry measurements of DMWs and adjacent similar metal welds to identify scanning gaps greater than 1/32-inches between the component surface and probe.
  - (a) Provide a discussion (surface waviness, probe lift-off, probe foot-print, etc) on any previously performed profilometry of the subject welds, including approximate coverage affected by gaps exceeding 1/32-inches and restrictions from counter bores and pipe curvatures (such as elbow curvature away from weld).
  - (b) Include a discussion on changes to the subject welds that minimizing examination effects from gaps greater than 1/32-inches and surface restrictions.

- (c) If the same vendor is performing the next examination of the subject welds, include a discussion on the improvements made to their UT technique for minimizing examination effects from gaps greater than 1/32-inches and surface restrictions.
  - (d) Provide a cross section sketch of the weld areas showing the base metal, weld, butter, and cladding and identify the materials (stainless steel, carbon steel, Inconel).
5. The request states that, "Applying the difference between the RMS error and the achieved RMS error to the actual flaw being sized will ensure a conservative bounding flaw depth value..." The growth of primary water stress corrosion cracking (PWSCC) in DMW can be relatively fast and can increase with greater crack depths. Experience shows that UT normally under sizes the depth of deep cracks. The proposed add-on is approximately 1/9 of the worse case error for DMW and 1/6 of the worse case error for austenitic-to-austenitic welds. The conditions influencing PWSCC growth and depth sizing accuracy reduces any conservatism that may exist in the proposed alternative. The origin of the proposed alternative was considered a short term solution until vendors were qualified.
- (a) Please consider limiting the RR duration to the next refueling outage for Braidwood Station, Units 1 and 2, or refueling outages through 2014.

M. Pacilio

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If you have any questions, please contact the Project Manager, Nicholas DiFrancesco, at (301) 415-1115.

Sincerely,

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Nicholas DiFrancesco, Project Manager  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-456 and 50-457

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JZimmerman, NRR

**ADAMS Accession No. ML111260532**

**NRR-028**

OFFICE	DORL/ LPL3-2/PM	DORL/LPL3-2/LA	DCI/CPNB*	DORL/ LPL3-2/BC
NAME	NDiFrancesco	SRohrer	TLupold / JTsao for	JZimmerman
DATE	5/23/11	5/23/11	5/12/11	5/25/11

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