

From: Wiebe, Joel
Sent: Friday, April 15, 2022 10:46 AM
To: Loomis, Thomas R:
Subject: Braidwood/Byron Verbal Authorization for Proposed Alternative I4R-15/I4R-21

VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
PROPOSED ALTERNATIVE I4R-15 FOR BRAIDWOOD STATION UNITS 1 AND 2;
PROPOSED ALTERNATIVE I4R-21 FOR BYRON STATION UNITS 1 AND 2
CONSTELLATION ENERGY GENERATION
DOCKET NOS. 50-456 50-457 50-454 50-455
April 15, 2022

Technical Evaluation read by Angela Buford, Chief of Vessels and Internals Branch, Office of Nuclear Reactor Regulation

By letter dated May 12, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21133A297), Exelon Generation Company (the licensee) proposed an alternative to several requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Table IWB-2500-1 for Braidwood Station (Braidwood) Units 1 and 2; and Byron Station (Byron) Units 1 and 2. This submittal was supplemental by letters dated November 16, 2021; March 10, 2022; and April 8, 2022 (ADAMS Accession Nos. ML21320A242, ML22069A580 and ML22098A179, respectively). On February 1, 2022 (ADAMS Accession No. ML22032A333), Exelon Generation Company, LLC was renamed Constellation Energy Generation, LLC (the licensee). Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee submitted a proposed alternative to reduce inspections of Category B-B, Item Nos. B2.11, pressurizer circumferential shell-to-head welds; Category B-B, Item 2.12 pressurizer longitudinal shell-to-head welds; and Category B-D, Items No. B3.110, pressurizer nozzle-to-vessel welds. The licensee presented a deterministic and probabilistic fracture mechanics (PFM) based analysis coupled with a performance monitoring plan to demonstrate that their alternative would provide an acceptable level of quality and safety. The licensee requested approval of the proposed alternative in support of the April 19th outage at Byron, Unit 2.

The licensee referenced the Electric Power Research Institute (EPRI) Report 3002015905, *“Technical Bases for Inspection Requirements for PWR [Pressurized Water Reactor] Pressurizer Head, Shell-to-Head, and Nozzle-to-Vessel Welds,”* dated December 2019 (ADAMS Accession No. ML21021A271). This report included a deterministic and probabilistic fracture mechanics (PFM) basis for reducing inspections of the subject components. The licensee provided information supporting that Braidwood Units 1 and 2; and Byron Units 1 and 2 were bounded by the report and that the report could be applied as part of a basis to optimize inspection frequency. The staff confirmed the applicability of the presented analysis to the subject plants. The staff find the licensees’ use of the analyses supportive of the proposed reductions in ASME Code required inspections, in concert with the substantial inspections already conducted, because the analyses provide significant insights into the impacts of reducing ASME Code required inspections.

Consistent with the key principles of the NRC risk-informed approach, the staff also confirmed that the alternative provides sufficient performance monitoring. Specifically, the staff evaluated the proposed number of inspections and inspection expansion plans relative to providing an appropriate level of quality and safety. The staff confirmed that the proposed inspections and expansion program described in letter dated April 8, 2022 will appropriately provide monitoring data and timely detection of any

potential novel indications that may arise in the future. The staff find the inspection and inspection expansion alternatives meet an acceptable level of quality and safety because they will provide appropriate performance monitoring in balance with the deterministic and probabilistic analyses.

Based on the above, the NRC staff finds that: (1) the EPRI analysis that the licensee has proposed for Braidwood Units 1 and 2; and Byron Units 1 and 2 provides a basis for reductions in the subject ASME Code ISI requirements, (2) the EPRI analysis is acceptably applicable to the subject units, (3) the proposed alternative inspection regime will provide adequate performance monitoring, and (4) should the licensee identify unacceptable indications per ASME Code, Section XI, IWB-3500 the licensee will appropriately expand inspections per this alternative. Consequently, the NRC finds that the proposed alternative will provide reasonable assurance that the structural integrity of the subject components will be maintained to an acceptable level of quality and safety.

Authorization read by Robert Kuntz, Acting Chief of the Plant Licensing Branch 3, Office of Nuclear Reactor Regulation

As Acting Chief of the Plant Licensing Branch 3, Office of Nuclear Reactor Regulation, I agree with the conclusions of the Vessels and Internals Branch.

The NRC staff concludes that the proposed alternative provides reasonable assurance of structural integrity of the subject pressurizer welds. The NRC staff finds that the alternative provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Similar to the statement in our letter dated August 3, 2021 (ADAMS Accession No. ML21138A006), since the pressurizer weld ISI requirements beyond the fourth 10-year intervals at Braidwood and Byron have not yet been established in accordance with 10 CFR 50.55a(g)(4)(ii), no authorization can be made at this time for subsequent ISI intervals following the fourth inspection interval. Therefore, as of April 15, 2022, the NRC authorizes the use of the proposed alternative for Braidwood Units 1 and 2; and Byron Units 1 and 2 during the fourth ISI intervals.

All other ASME Code, Section XI, requirements for which an alternative was not specifically requested and authorized remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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