

From: [Zozula, Camille T.](#)
To: [Hoc, HOO X](#)
Subject: [External_Sender] Westinghouse 10 CFR 21 report
Date: Wednesday, September 4, 2024 6:51:35 PM
Attachments: [image001.png](#)
[LTR-NRC-24-35 Part 21 Reporting.pdf](#)

Hello,

Please see the attached non-proprietary report for a 10 CFR 21 report from Westinghouse Electric Company.

Camille Zozula
Manager, Global Nuclear Regulatory Affairs



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LTR-NRC-24-35
September 4, 2024

Subject: Notification of the Potential Existence of Defects Pursuant to 10 CFR Part 21

The following information is provided pursuant to the requirements of 10 CFR Part 21 to report a defect that could lead to a substantial safety hazard. This issue concerns the Westinghouse designed and manufactured CR99™ and Trident X™ boiling water reactor (BWR) control rod blades (CRBs).

- (i) Name and address of the individual or individuals informing the Commission.

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- (ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

Generations 2 and 3 CR99, CR99+, and Trident X BWR CRBs

- (iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

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- (iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

The CR99 CRBs were designed with dimensional and material choices for mechanical stability such that the mechanical function is maintained throughout the life of the control rod. However, observed cracking at US licensees, resulting from irradiation assisted stress corrosion cracking (IASCC), occurred before the nuclear end of life. Therefore, the current depletion limits that define nuclear end of life are not sufficient to prevent cracking, and the

continued use of uninspected CRBs can lead to further cracking. With severe cracking of the CRBs, boron loss can occur and negatively impact the shutdown margin.

To date, Westinghouse is aware that plants which experienced CRB cracking have been able to scram their cracked CRBs, safely shut down the reactor, and maintain it in a safe shutdown condition.

Trident X is susceptible to IASCC and within the scope of this notification. However, the first Trident X CRBs were installed in a US operating plant earlier in 2024 and have operated for less than one cycle.

- (v) The date on which the information of such defect or failure to comply was obtained.

The Westinghouse President and CEO was informed of this issue on September 2, 2024.

- (vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

Non-US licensees are not subject to the regulations in this part and are identified with (*).

Operating Plants with Generations 2 and 3 CR99 CRBs

Brunswick Units 1 and 2 (194)	La Salle Unit 1 (7)
Dresden Unit 3 (8)	Nine Mile Point Unit 2 (12)
Forsmark Units 1, 2, and 3 (99)*	Olkiluoto Units 1 and 2 (33)*
Hatch Units 1 and 2 (124)	Oskarshamn Unit 3 (114)*
Hope Creek (122)	Quad Cities Unit 1 (12)
Kernkraftwerk Leibstadt (21)*	Susquehanna Units 1 and 2 (222)
Kuosheng Units 1 and 2 (cold shutdown) (114)*	

Permanently Shutdown/Decommissioned Plants with Generations 2 and 3 CR99 CRBs

Duane Arnold (14)	Isar Unit 1 (12)*
Gundremmingen B and C (4)*	Ringhals Unit 1 (34)*

Operating Plants with CR99+ CRBs

Forsmark Units 1 and 2 (70)*

Oskarshamn Unit 3 (131)*

Olkiluoto Units 1 and 2 (80)*

Decommissioned Plants with CR99+ CRBs

Ringhals Unit 1 (16)*

Operating Plants with Trident X CRBs

Brunswick Unit 1 (6)

- (vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

Westinghouse generated a CAP Issue Report (IR), and a root cause analysis is in-progress. The CAP IR is scheduled for closure in Q1 2025 and includes the following actions:

- Review WCAP-16182 and revise accordingly; submit to NRC for review and approval.
- Develop an inspection and surveillance plan in coordination with U.S. licensees and communicate inspection results to stakeholders.
- Develop a licensing commitment management tool.
- Identify and address gaps in qualifications, training, and organizational responsibilities.

- (viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

Westinghouse continues to communicate with impacted licensees and will issue plant-specific operating recommendations.

(ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

Not applicable

A handwritten signature in black ink, appearing to read "Camille Zozula". The signature is fluid and cursive, with the first name "Camille" written in a larger, more prominent script than the last name "Zozula".

Camille T. Zozula
Part 21 Program Manager

cc: E. Lenning