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NRC Pre-Submittal Meeting

Proposed Alternative for Reactor Vessel Closure Stud Exam Optimization

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Overview of Relief Request

In accordance with 10 CFR 50.55a(z)(1), Constellation Energy Generation, LLC (CEG) will request Nuclear Regulatory Commission (NRC) approval to implement a proposed alternative to the requirements of ASME Section XI IWB-2500(a), Table IWB-2500-1, Examination Category B-G-1, Item No. B6.20, Reactor Vessel Closure Studs.

Affected Components:
ASME Category B-G-1, Item Number B6.20, Reactor Vessel Closure Studs.

ASME Category	Item Number	Description	Examination Method
B-G-1	B6.20	Reactor Vessel Closure Studs	Volumetric or Surface

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Proposed Alternative

CEG proposes to extend the frequency of RPV closure stud volumetric or surface examination for the remainder of the currently licensed operating periods (Table 1) for the units listed below:

- Braidwood Unit 1
- Byron Units 1 and 2
- Calvert Cliffs Units 1 and 2
- Clinton Unit 1
- Fitzpatrick
- LaSalle Units 1 and 2
- Limerick Units 1 and 2
- Nine Mile Point Units 1 and 2
- Peach Bottom Units 2 and 3

The remaining CEG units will continue to be inspected in accordance with ASME XI requirements as a part of a performance monitoring plan. This performance monitoring plan consists of 6 units.

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Table 1: Current ISI Intervals and License Periods

Plant/Unit	Current ISI Interval End Date	Current License Period End Date	Date of Last Category B-G-1, Item Number B6.20 Examination	Length of Relief Requested (years)
Braidwood Generating Station, Unit 1	07/28/28	10/17/46	09/17/13	33.1
Byron Generating Station, Units 1 and 2	07/15/25	10/31/44 (Unit 1) 11/06/46 (Unit 2)	S01-S18: 09/19/18 (Unit 1) S19-S36: 09/21/21 (Unit 1) S37-S54: 09/22/15 (Unit 1) S01-S18: 10/07/17 (Unit 2) S19-S36: 04/28/22 (Unit 2) S37-S54: 10/14/23 (Unit 2)	29.1 (Unit 1) 29.1 (Unit 2)
Calvert Cliffs Nuclear Power Plant, Units 1 and 2	06/30/29	07/31/34 (Unit 1) 08/13/36 (Unit 2)	03/09/10 (Unit 1) 02/26/11 (Unit 2)	24.4 (Unit 1) 25.5 (Unit 2)
Clinton Power Station, Unit 1	06/30/30	04/17/27	09/18/19	7.6
James A. FitzPatrick Nuclear Power Plant	06/15/27	10/17/34	S01-S17 & S33-S52: 01/15/17 S18-S32: 09/17/18	17.8
LaSalle County Station, Units 1 and 2	09/30/27	04/17/42 (Unit 1) 12/16/43 (Unit 2)	S01-S22: 02/25/18 (Unit 1) S23-S68: 02/20/16 (Unit 1) 02/10/17 (Unit 2)	26.2 (Unit 1) 26.9 (Unit 2)
Limerick Generating Station, Units 1 and 2	01/31/27	08/26/44 (Unit 1) 06/22/49 (Unit 2)	03/28/16 (Unit 1) 04/24/17 (Unit 2)	28.5 (Unit 1) 32.2 (Unit 2)
Nine Mile Point Nuclear Station, Unit 1	08/22/29	08/22/29	S01-S22: 03/26/11 S23-S43: 04/20/13 S44-S68: 03/27/17	18.4
Nine Mile Point Nuclear Station, Unit 2	08/22/28	10/31/46	S01-S25: 03/11/20 S26-S50: 03/15/22 S51-S76: 04/26/16	30.6
Peach Bottom Atomic Power Station, Units 2 and 3	12/31/28	08/08/53 (Unit 2) 07/02/54 (Unit 3)	S01-S46: 10/19/10 (Unit 2) S47-S92: 10/28/16 (Unit 2) S01-S46: 09/30/11 (Unit 3) S47-S92: 09/26/15 (Unit 3)	28.2 (Unit 2) 27.3 (Unit 3)

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Basis for Request

The Electric Power Research Institute (EPRI) recently developed a technical basis report (Report No. 3002014589) that determined the requirement to perform inservice volumetric or surface examinations of Reactor Pressure Vessel (RPV) closure studs could be extended beyond the end of the current operating periods identified in Table 1 without increasing plant risk or posing any safety concerns for the RPV.

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Technical Justification

The aging effects for RPV closure studs identified in the Generic Aging Lessons Learned (GALL) report and the GALL Report for Subsequent License Renewal (GALL-SLR) are:

1. cumulative fatigue damage or fatigue cracking
2. stress corrosion cracking (SCC)
3. loss of material due to wear, general corrosion, pitting or crevice corrosion.

The EPRI report also documents generic stress and flaw tolerance assessments performed for the RPV closure studs.

1. a series of static and transient stress analyses to define the operating stresses in the reactor vessel closure studs
2. a fatigue crack growth calculation using the operating stresses
3. a limiting flaw size calculation.

The EPRI report provides eight criteria to assess the plant-specific applicability of the technical basis and the supporting stress and flaw tolerance assessments for the RPV closure studs.

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Technical Justification

- Ongoing review of both plant specific and industry Operating Experience (OE), including relevant research and development, will ensure Aging Management Programs will be enhanced or modified to continue to remain effective.
- RPV closure stud examinations in accordance with ASME Section XI requirements will continue to be performed at the CEG units listed below:
  - Braidwood Generating Station, Unit 2, Dresden Nuclear Power Station, Units 2 and 3, R. E. Ginna Nuclear Power Plant, Unit 1, and Quad Cities Nuclear Power Station, Units 1 and 2

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Applicability and Inspection History

- The following previous submittal has been made by Duke Energy to provide relief from the ASME Section XI Examination Category B-G-1 Item Number B6.20 volumetric examinations based on the Reference (Report No. 3002014589) technical basis report:
  - Letter from S. Snider (Duke Energy) to the U.S. NRC, “Relief Request for Alternative for Reactor Vessel Closure Stud Examinations,” dated December 1, 2020, ADAMS Accession No. ML20336A033.
- Inspection History is detailed in Table 1 for Category B-G-1, Item Number B6.20

Conclusion of CEG Request for Relief: CEG requests authorization to use the proposed alternative pursuant to 10 CFR 50.55a(z)(1) on the basis that the alternative provides an acceptable level of quality and safety.

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Proposed Schedule

- 4th quarter 2024 – CEG prepare proposed alternative
- January 2025 – CEG submit proposed alternative
- January 2026 – CEG requested approval date to support implementation prior to next scheduled examination

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Questions?

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