

RS-22-080

June 9, 2022

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Dresden Nuclear Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Withdrawal and Proposed Alternative I6R-08 Associated with Code Case N-921 for Sixth Inservice Inspection Intervals

- References:
- 1) Letter from D. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Proposed Relief Request Associated with Code Case N-921," dated January 18, 2022 (ML22018A106)
 - 2) "NRC Slides for February 25, 2022 Meeting - Acceptance Review of Proposed Alternative to Adopt ASME Code Case N-921 at Dresden and Quad Cities," dated February 22, 2022 (ML22053A291)
 - 3) Letter from B. Purnell (U.S. Nuclear Regulatory Commission) to D. Rhoades. Loomis (Constellation Energy Generation, LL), "Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 - Supplemental Information Needed for Acceptance of Proposed Alternative to Use ASME Code Case N-921 (EPID L-2022-LLR-0009)," dated May 24, 2022 (ML22062B649)

In the Reference 1 letter, Exelon Generation Company, LLC (now known as Constellation Energy Generation, LLC (CEG)) requested a proposed alternative concerning the use of Code Case N-921, "Alternative 12-yr Inspection Interval Duration, Section XI, Division 1" for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2. Meetings were conducted with CEG on February 25, 2022 and May 24, 2022 to review the U.S. Nuclear Regulatory Commission's requests for supplemental information (References 2 and 3, respectively) related to this request. In the Reference 3 letter, the U.S. Nuclear Regulatory Commission supplied the request for supplemental information.

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Based upon further review, CEG is withdrawing the Reference 1 proposed alternative. In lieu of this request, CEG is submitting a similar request but only for the sixth Inservice Inspection (ISI) interval for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2. At this time the proposed alternative is limited to the ISI program and does not apply to the Containment Inservice Inspection (CISI) program. The above changes in approach are in response to comments received from NRC staff during the acceptance review meetings.

Attachment 1 contains this request. Approval of this sixth ISI interval proposed alternative is requested by December 31, 2022, in order to support the start dates for the sixth ISI intervals for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2, which are scheduled to begin January 20, 2023, and April 2, 2023, respectively.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please contact Tom Loomis at 610-765-5510.

Respectfully,



David T. Gudger
Sr. Manager - Licensing & Regulatory Affairs
Constellation Energy Generation, LLC

Attachment: 1) Proposed Alternative I6R-08 Associated with Code Case N-921 for the Sixth
Inservice Inspection Intervals

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector - Dresden Nuclear Power Station
NRC Senior Resident Inspector - Quad Cities Nuclear Power Station
NRC Project Manager - Dresden Nuclear Power Station
NRC Project Manager - Quad Cities Nuclear Power Station
Illinois Emergency Management Agency - Division of Nuclear Safety
J. W. Dougherty - Mid-American Energy

Attachment 1

**Proposed Alternative I6R-08 Associated with Code Case N-921 for the Sixth
Inservice Inspection Intervals**

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Proposed Alternative I6R-08 Associated with Code Case N-921 for the Sixth Inservice Inspection Intervals in Accordance with 10 CFR 50.55a(z)(1)

1. ASME CODE COMPONENTS AFFECTED

All ASME Code Class 1, 2, and 3 components.

This proposed alternative is limited to IWA-2430, IWA-2431, and Tables IWB-2411-1, IWC-2411-1, IWD-2411-1, and IWF-2410-1.

2. APPLICABLE CODE EDITION AND ADDENDA

| <u>PLANT</u> | <u>INTERVAL</u> | <u>EDITION</u> | <u>START DATE</u> | <u>CURRENT END DATE</u> | <u>REVISED END DATE</u> |
|--|-----------------|----------------|-------------------|-------------------------|-------------------------|
| Dresden Nuclear Power Station, Units 2 and 3 | Sixth ISI | 2017 Edition | January 20, 2023 | January 19, 2033 | January 19, 2035 |
| Quad Cities Nuclear Power Station, Units 1 and 2 | Sixth ISI | 2017 Edition | April 2, 2023 | April 1, 2033 | April 1, 2035 |

3. APPLICABLE CODE REQUIREMENTS

10 CFR 50.55a(b)(5)(ii) & (iii), ISI (Inservice Inspection) Code Case Condition: These sections contain requirements for applying different revisions of a Code Case or applying an annulled Code Case. These sections state, in part, that the licensee may continue to apply the previous version of the Code Case, as authorized or may apply the later version of the Code Case, or may continue to apply the annulled Code Case including any NRC-Specified conditions placed on its use to the end of the current 120-month interval.

10 CFR 50.55a(g)(4)(ii), Applicable ISI Code: Successive 120-month interval, states in part, that Inservice examination of components and system pressure tests conducted during successive 120-month inspection intervals must comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in paragraph (a) of this section 18 months before the start of the 120-month inspection interval.

10 CFR 50.55a(g)(5)(i), ISI program update: Applicable ISI Code editions and addenda, states that the inservice inspection program for a boiling or pressurized water-cooled nuclear power facility must be revised by the licensee, as necessary, to meet the requirements of paragraph (g)(4) of this section.

10 CFR 50.55a(g)(5)(iii) & (iv), Notification of impractical ISI Code requirements & Schedule for completing impracticality determinations. These sections contain requirements related to determinations of impracticality and the schedule for submittal of such requests to the NRC for the subsequent 120-month inspection interval for which relief is sought.

IWA-2430 – INSPECTION INTERVALS – This section states that the inservice examinations and system pressure tests required by IWB, IWC, IWD, and inservice examinations and tests required by IWF shall be completed during each of the inspection intervals for the service lifetime of the plant. The inspections shall be performed in accordance with the schedule of the Inspection Program of IWA-2431.

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IWA-2431 - Inspection Program - The inspection intervals shall comply with the following, except as modified by IWA-2430(c) and IWA-2430(d):

1st Inspection Interval - 10 years following initial start of plant commercial service

Successive Inspection Intervals - 10 years following the previous inspection interval

Table IWB-2411-1, IWC-2411-1, IWD-2411-1, and IWF-2410-1 – Inspection Program – These Tables provide the calendar years of plant service within the interval for each period (3 years, 7 years, 10 years) and the distribution of examinations to be completed within each period.

4. REASON FOR REQUEST

Constellation Energy Generation, LLC (CEG) requests approval to implement Code Case N-921 at Dresden Nuclear Power Station, Units 2 and 3 (Dresden) and Quad Cities Nuclear Power Station, Units 1 and 2 (Quad Cities). This Code Case establishes a 12-year (144 month) inspection interval for inspection programs. This is a marginal extension from a 10-year (120 month) to 12-year (144 month) interval which supports improved operational strategies such as divisional outages and optimized ISI outages. The minimal change of extending the interval length will not reduce plant safety.

5. PROPOSED ALTERNATIVE AND BASIS FOR USE

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), CEG is requesting the use of Code Case N-921 on the basis that the proposed alternative provides an acceptable level of quality and safety.

This proposed alternative is limited to IWA-2430, IWA-2431, and Tables IWB-2411-1, IWC-2411-1, IWD-2411-1, and IWF-2410-1. The revised inspection interval and periods, along with tentatively scheduled outage dates, will be implemented as shown in Tables 1 and 2 below for Dresden and Quad Cities, respectively.

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**TABLE 1 - DRESDEN UNITS 2 AND 3
SIXTH ISI INTERVAL/PERIOD/OUTAGE MATRIX**

| Unit 2 | | Period | Interval | Period | Unit 3 | |
|------------------|-----------------------------|--|--|--|-----------------------------|------------------|
| Outage Number | Projected Outage Start Date | Projected Start Date to End Date | Start Date to End Date | Projected Start Date to End Date | Projected Outage Start Date | Outage Number |
| D2R28 (6-1-1) | Scheduled 11/2023 | 1 st 01/20/2023 to 01/19/2027 | 6 th ISI 01/20/2023 to 01/19/2035 | 1 st 01/20/2023 to 01/19/2027 | Scheduled 11/2024 | D3R28 (6-1-1) |
| D2R29 (6-1-2) | Scheduled 11/2025 | | | | Scheduled 11/2026 | D3R29 (6-1-2) |
| D2R30 (6-2-1) | Scheduled 11/2027 | 2 nd 01/20/2027 to 01/19/2031 | | 2 nd 01/20/2027 to 01/19/2031 | Scheduled 11/2028 | D3R30 (6-2-1) |
| D2R31 (6-2-2) | Scheduled 11/2029 | | | | Scheduled 11/2030 | D3R31 (6-2-2) |
| D2R32 (6-3-1) | Scheduled 11/2031 | 3 rd 01/20/2031 to 01/19/2035 | | 3 rd 01/20/2031 to 01/19/2035 | Scheduled 11/2032 | D3R32 (6-3-1) |
| D2R33 (6-3-2) | Scheduled 11/2033 | | | | Scheduled 11/2034 | D3R33 (6-3-2) |

**TABLE 2 - QUAD CITIES UNITS 1 AND 2
SIXTH ISI INTERVAL/PERIOD/OUTAGE MATRIX**

| UNIT 1 | | Period | Interval | Period | Unit 2 | |
|------------------|-----------------------------|--|--|--|--------------------------------|------------------|
| Outage Number | Projected Outage Start Date | Projected Start Date to End Date | Start Date to End Date | Projected Start Date to End Date | Projected Outage Start Date or | Outage Number |
| Q1R28 (6-1-1) | Scheduled 03/2025 | 1 st 04/02/2023 to 04/01/2027 | 6 th ISI 04/02/2023 to 04/01/2035 | 1 st 04/02/2023 to 04/01/2027 | Scheduled 03/2024 | Q2R27 (6-1-1) |
| Q1R29 (6-1-2) | Scheduled 03/2027 | | | | Scheduled 03/2026 | Q2R28 (6-1-2) |
| Q1R30 (6-2-1) | Scheduled 03/2029 | 2 nd 04/02/2027 to 04/01/2031 | | 2 nd 04/02/2027 to 04/01/2031 | Scheduled 03/2028 | Q2R29 (6-2-1) |
| Q1R31 (6-2-2) | Scheduled 03/2031 | | | | Scheduled 03/2030 | Q2R30 (6-2-2) |
| Q1R32 (6-3-1) | Scheduled 03/2033 | 3 rd 04/02/2031 to 04/01/2035 | | 3 rd 04/02/2031 to 04/01/2035 | Scheduled 03/2032 | Q2R31 (6-3-1) |
| Q1R33 (6-3-2) | Scheduled 03/2035 | | | | Scheduled 03/2034 | Q2R32 (6-3-2) |

Additionally, this proposed alternative includes 10 CFR 50.55a(b)(5)(ii) & (iii), (g)(4)(ii), and (g)(5)(i), (iii) & (iv) in that the requirements related to the 120-month interval will be revised to a 144-month interval to ensure consistency with Code Case N-921. These portions of this request for alternative are made in accordance with 10 CFR 50a(z)(1), which states

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“Alternatives to the requirements of paragraphs (b) through (h) of this section or portions thereof may be used when authorized by the Director, Office of Nuclear Reactor Regulation.”

This proposed alternative includes a request for relief from 10 CFR 50.55a(b)(5)(ii) & (iii) to recognize the extended 144-month interval. Code Cases will be applied during the extended 144-month interval as specified in 10 CFR 50.55a, IWA-2440, and the background of Regulatory Guide 1.147, “Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1,” as modified by this proposed alternative, with all applicable current and future NRC conditions and limitations. No changes to the current method for approving and implementing Code Cases are being proposed. Code Cases are implemented throughout the interval through the ASME Code, proposed alternatives, and Regulatory Guide 1.147. This alternative will maintain the current levels of safety that are provided in the process for implementing Code Cases. All references in 10 CFR 50.55a(b)(5)(ii) & (iii) to a 120-month interval will be revised to a 144-month interval.

This proposed alternative includes a request for relief from 10 CFR 50.55a(g)(4)(ii) to recognize the extended 144-month interval. This change is required to maintain consistency between Code Case N-921 and the 10 CFR 50.55a requirements for the duration of an inspection interval and the requirement to update to the latest endorsed Edition of ASME Section XI. All references in 10 CFR 50.55a(g)(4)(ii) to a 120-month interval will be revised to a 144-month interval. The update to the Code of Record as required by (g)(4)(ii) will be performed at the end of the extended 144-month interval. 10 CFR 50.55a(g)(5)(i) also references paragraph (g)(4), for applicable ISI Code editions and addenda. 10 CFR 50.55a(g)(4)(ii) will be modified as discussed previously.

This proposed alternative includes a request for relief from 10 CFR 50.55a(g)(5)(iii) & (iv) to recognize the extended 144-month interval. All references in 10 CFR 50.55a(g)(5)(iii) & (iv) to a 120-month interval will be revised to a 144-month interval. Proposed alternatives based on impracticality will be submitted to the NRC no later than 12 months after the expiration of the extended 144-month interval for which relief is sought. This proposed alternative alters the length of the interval, but it maintains the 12 month timeframe from the end of the interval to submit alternatives for impracticalities and thus maintains the current levels of safety. Section 2 of the proposed alternative contains the new end of interval dates.

Currently ASME Section XI breaks up the 10-year inspection interval into (3) periods (typically a 3-4-3 year breakdown for periods). The intent of the code case is to establish four-year periods (4-4-4 year breakdown) over the course of a 12-year inspection interval. This change supports light water-cooled plants that have transitioned from 18-month refueling cycles to 24-month refueling cycles, such as Dresden and Quad Cities, and ensures each inspection period during a 12-year interval will have at least two refueling outages (2-2-2 outage format). Having a minimum two refueling outages per period at Dresden and Quad Cities is an improvement over the current 10-year interval where one inspection period will have only a single outage to complete all required examinations. Having only a single refueling outage to complete examinations places undue burden on plants to meet required inspection period percentage requirements as well as the need to complete all required periodic examinations and testing within a single outage.

Also, for inspection periods with a single outage, this requires additional trains/divisions of equipment to be removed from service or aligned to facilitate periodic exams and tests for the outage. This results in a reduction of train availability and safety equipment. Dresden and Quad Cities have gone to “train-specific” outages where most of the work is only performed on a single train/division in order to minimize train swaps and complex operational alignments.

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Having a minimum two refueling outages per period will support improved operational strategies such as divisional outages and optimized ISI outages for the sixth ISI interval at Dresden and Quad Cities. The divisional outage strategy is based on the concept that only one division of safety systems is removed from service during an outage as compared to swapping between divisions of safety systems during an outage. The divisional outage strategy enhances safety by reducing the challenges of swapping safety trains during an outage. Having two refueling outages per period also allows the scope for the inspection interval to be distributed as efficiently as possible, considering ASME Section XI scheduling requirements and these improved operational strategies, which will also provide an overall dose savings. Implementing this Code Case, and improved operational strategies, will increase safety system availability during outages, will reduce the potential for human performance issues, will result in reduced radiation exposure, and will result in a significant cost savings to Dresden and Quad Cities.

This proposed alternative extends the sixth ISI interval from 10 to 12 years at Dresden and Quad Cities. The examinations required by ASME Section XI for the 120-month interval will be performed and distributed across the three periods of the 144-month interval as required by Code Case N-921. Dresden and Quad Cities will implement a risk informed ISI program in accordance with Code Case N-716-2 during the sixth ISI interval. A delta-risk assessment is performed each period as part of the risk-informed ISI program. The change to a 144-month interval does not impact the ability to meet the risk-informed ISI inspection acceptance criteria or any other requirements of Code Case N-716-2. All augmented inspection requirements will continue to be implemented on the schedule required by the augmented inspection programs. The satisfactory completion of all ASME Section XI examinations distributed amongst the three inspection periods during the 144-month inspection interval will continue to provide an acceptable level of quality and safety.

Any commitments related to License Renewal will continue to be met by compliance with the ISI program prior to the end of the license renewal period. All ISI inspections will remain in compliance with the ASME Code until the end of license unless specific relief is granted.

It is noted that Section XI allows a deviation of 12-months to the 120-month interval. There is no safety basis for this adjustment, but rather, it permits the licensee to accommodate scheduling issues and outage alignment. Considering this provision of the ASME Code, the proposed alternative would revise the length of the interval a mere 12 months beyond what is currently allowed by Section XI. This extension is considerably less than the length of an operating cycle at Dresden and Quad Cities.

There is no safety basis for establishing the 120-month interval time requirement. The time requirement for licensees to revise their ISI program intervals to 120-months was introduced into 10 CFR 50.55a in 1979.¹ Previously, the program update periodicity had been 40 months. As the Commission then stated, the purpose of increasing the ISI intervals from 20/40 months to 120 months was “to make this interval consistent with the inservice inspection interval in Section XI of the ASME Code” and that this change would make “the regulation more practical to implement and saves time and effort for both the NRC and the licensee without an increased risk to the public health and safety.”² By increasing the length of the interval to 120 months, no increase in risk was determined. Since that time, adjustments to the interval length have not impacted safety or resulted in an increased risk. The 120 months is a schedule not based on safety.

¹ 44 Fed. Reg. 57912 dated October 9, 1979.

² 44 Fed. Reg. at 57913.

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Adjusting the duration of the inspection interval by 24 months will not alter plant safety or alter the ability of the units to identify issues that may require repair or additional inspection. Additionally, all ASME Section XI requirements will be met over the 144-month interval; therefore, the proposed alternative will provide an acceptable level of quality and safety.

Dresden and Quad Cities previously submitted proposed alternatives applicable to the sixth ISI interval. Dresden submitted two proposed alternatives on March 25, 2022 (ML22084A615) and Quad Cities submitted one proposed alternative on March 25, 2022 (ML22084A597). A review of these previously submitted proposed alternatives determined that they are not dependent on the interval length, and approval of these proposed alternatives is not impacted by a 12-year interval as discussed below. These proposed alternatives were submitted in accordance with 10 CFR 50.55a(z)(2) on the basis that compliance with the specified Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Both Dresden and Quad Cities submitted a proposed alternative related to inspection of the Standby Liquid Control (SBLC) Nozzle Inner Radius. This alternative is required due to the physical configuration of the SBLC nozzle and the inability to perform the ASME XI required ultrasonic examination of the inside radius section. The proposed alternative of a VT-2 visual examination during the Class 1 system leakage test each refueling outage and adherence to the Technical Specification Surveillance Requirements for RCS leakage ensure that the overall level of plant quality and safety will not be compromised. The requirements of the proposed alternative will continue to be satisfied during each outage of the extended 12-year inspection interval.

Dresden submitted another proposed alternative related to the pressure testing frequency for the isolation condenser shell side and associated piping. This alternative is required because the shell side of the isolation condenser is only pressurized to the ASME XI required test conditions once every 10 years during the performance of the Technical Specification Surveillance, instead of the ASME XI required frequency of once each inspection period. The proposed alternative is to perform the required VT-2 visual examination in conjunction with the completion of the Technical Specification Surveillance. During the other two inspection periods the required VT-2 visual examination will be performed using the static head pressure associated with the normal isolation condenser level maintained during normal standby conditions. The requirements of the proposed alternative will continue to be satisfied during each period of the extended 12-year interval.

Any further relief requests for the sixth interval will be based on a 12-year interval.

Conclusion

This relief request implements Code Case N-921 which extends the sixth ISI interval for 24 months at Dresden and Quad Cities. The examinations required by ASME Section XI for the 120-month interval will be performed and distributed across the three periods of the 144-month interval as required by Code Case N-921. This will allow for the implementation of improved operational strategies, such as divisional outage strategy, which will increase safety system availability during outages. This will also allow for the required examinations and tests to be distributed as efficiently as possible over each period which will result in reduced radiation exposure and reduced cost. Implementation of all ASME Section XI examination and testing requirements during the 144-month interval will provide an acceptable level of quality and safety.

6. **DURATION OF PROPOSED ALTERNATIVE**

The proposed alternative will be applicable for the duration of the sixth ISI interval.

7. **PRECEDENTS**

None