

From: Wiebe, Joel
Sent: Tuesday, July 14, 2020 2:15 PM
To: Nicely, Ken M.:(GenCo-Nuc) (ken.nicely@exeloncorp.com)
Subject: Preliminary RAIs Regarding Clinton RR I4R-06

Hi Ken,

These RAIs reference proprietary BWRVIP documents. Please have these reviewed and let me know if we have included any proprietary information in the RAIs. I will not be placing these in ADAMS until you get back with me. Let me know by July 21, 2020, if you need a clarification call on the RAIs. A response is requested 30 days from the date of this request or, if a clarification call is held, 30 days from the clarification call.

Joel

By letter dated December 16, 2019, (Agencywide Documents Access and Management System (ADAMS), Accession No. ML19350C642), Exelon Generation Company, LLC (the licensee), submitted Proposed Alternative Request No. I4R-06 (Proposed Alternative) to certain requirements of the American Society of Mechanical Engineers, Boiler and Pressure Vessel Code (ASME Code), for the fourth 10-year inservice inspection (ISI) Program for the Clinton Power Station, Unit 1 (Clinton). Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(z)(1), the licensee requested approval to implement alternative BWRVIP Guidelines in lieu of ASME Code Section XI Table IWB-2500-1 Examination Category B-N-1 and B-N-2 requirements. The licensee's proposed alternative applies to the fourth ISI interval.

In order for the staff to determine if the proposed alternative may be authorized pursuant to 10 CFR 50.55a(z)(1), the staff requests the licensee provide the following additional information.

RAI 1

10 CFR 50.55a(g)(4) requires inservice inspection of ASME Code Class 1 components to be performed in accordance with Section XI of the ASME Code. The licensee has proposed an alternative to the inspection requirements of Section XI for ASME Code Class 1, Examination Category B-N-1 and B-N-2 components. Specifically, the licensee proposed that accessible surfaces of shroud support legs be examined with the appropriate method in accordance with the Boiling Water Reactor Vessel and Internals Program (BWRVIP) Topical Report BWRVIP-38, Section 3.2.3 (proprietary) and the NRC staff's SE of BWRVIP-38 dated July 24, 2000 (BWRVIP-38 SE, ADAMS Accession No. ML003735498). The licensee also proposes that the lower plenum inspection be performed in accordance with BWRVIP Topical Report BWRVIP-47-A (proprietary), which was approved by NRC letter dated September 1, 2005 (ADAMS Accession No. ML052490537).

RAI 1a

Issue 3.1.2 in the BWRVIP-38 SE states that the BWRVIP considers that inspection of shroud support legs to be unnecessary, while the NRC staff considers that an appropriate re-inspection schedule, based on appropriate safety considerations, should be established by the BWRVIP in a revised BWRVIP-38 report. The NRC staff concluded in the BWRVIP-38 SE that this issue is open and that the BWRVIP should provide the proposed revised inspection guidance, with appropriate scope expansion criteria and a re-inspection schedule, to the staff in a timely manner.

Since the licensee proposed alternative makes reference to an SE with an open item, and the BWRVIP has not yet provided revised inspection guidance, the NRC staff requests that the licensee discuss the following, related to the inspection of the shroud support welds (defined as those welds below H9, such as weld H12):

- Are inspections of the shroud support leg welds planned at Clinton during the 4th ISI interval?
- Will the shroud support leg welds at Clinton be accessible for inspection during the 4th ISI interval?
- If inspections are not planned and the shroud support leg welds are accessible, provide a technical basis describing how the structural integrity of the core shroud will be maintained regarding potential degradation due to intergranular stress corrosion cracking (IGSCC).

RAI 1b

Section 3.2.4 in BWRVIP-47-A states that no additional inspections are recommended beyond the baseline inspections, and scope expansion and follow-on inspections deemed necessary in the event flaws are found. Section 3.2.4 in BWRVIP-47-A also states, in part, that baseline inspection results will be reviewed by the BWRVIP and, if deemed necessary, reinspection recommendations will be developed at a later date and provided to the NRC. The NRC staff concluded in the Final Safety Evaluation (BWRVIP-47-A, Appendix C, Section 2.3) that the “BWRVIP committed to address the issue of reinspection in the future after initial baseline inspections have been completed by a majority of U. S. BWRs. The staff accepted this commitment.”

Since the licensee proposed alternative makes reference to an SE with an unresolved commitment, and the BWRVIP has not yet provided revised inspection guidance, the NRC staff requests that the licensee discuss the following, related to the inspection of the lower plenum components:

- Are inspections of the lower plenum components planned at Clinton during the 4th ISI interval?
- Will the lower plenum components at Clinton be accessible for inspection during the 4th ISI interval?
- If inspections are not planned and lower plenum components are accessible, provide a technical basis describing how the integrity and function of the lower plenum supports will be maintained regarding potential degradation due to IGSCC.

RAI 2

10 CFR 50.55a(g)(4) requires inservice inspection of ASME Code Class 1 components to be performed in accordance with Section XI of the ASME Code. The licensee has proposed an alternative to the inspection requirements of Section XI for ASME Code Class 1, Examination Category B-N-1 and B-N-2 components. Specifically, the licensee proposed that tie-rod shroud repairs be examined per repair designer recommendations in accordance with BWRVIP-76-R1-A, Section 3.5 (ADAMS Accession No. ML15266A189). However, BWRVIP-76-R1-A, Section 3.5 specifies two options for inspection of repair components after the first cycle:

- Option 1: Perform a detailed inspection of all repair assemblies after the first cycle. If all assemblies are satisfactory, no inspections are required for 10 years.

- Option 2: Perform a detailed inspection of 25% of the assemblies after the first cycle and a VT-3 of the other 75% of the assemblies. If the inspection results are satisfactory, detailed inspections of one-third of the remaining assemblies shall be performed during each of the next three outages. Re-inspect each assembly on a 10-year cycle.

Although the inspection summaries referenced in Table 1 of the proposed alternative suggest a modified version of Option 2 was adopted in the past, the proposed alternative does not specify what inspection frequency will be used going forward. Therefore, the NRC staff requests that the licensee describe the proposed inspection frequency of the tie-rod shroud repairs for the fourth ISI interval at Clinton.

RAI 3

The licensee proposed alternative states that:

“Where guidance in existing BWRVIP documents has been supplemented or revised by subsequent correspondence approved by the BWRVIP Executive Committee, the vessel and internals program shall be modified to reflect the new requirements and implement the guidance within two refueling outages, unless a different schedule is specified by the BWRVIP. However, if approved BWRVIP inspection guidance approved by the Executive Committee includes changes to NRC approved BWRVIP inspection guidance that are less conservative than those approved by the NRC, the less conservative guidance shall be implemented only after the NRC approves the changes, which generally means publication of a ‘-A’ document or equivalent.

Where the revised version of a BWRVIP inspection guideline continues to also meet the requirements of the version of the BWRVIP inspection guideline that forms the safety basis for the NRC-authorized proposed alternative to the requirements of 10 CFR 50.55a, it may be implemented. Otherwise, the revised guidelines will only be implemented after NRC approval of the revised BWRVIP guidelines or a plant-specific request for relief has been approved.”

As stated in a meeting with Exelon on December 19, 2018 (ADAMS Accession No. ML18354B171), the NRC staff is unable to approve a licensee proposal that BWRVIP guidelines can be revised without a subsequent plant-specific request, because the licensee is requesting to use revisions of BWRVIP Topical Reports that NRC staff have not yet seen. The NRC staff determined that one acceptable resolution would be to remove the above two paragraphs from the proposed alternative request.

RAI 4

BWRVIP-62-A, “Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection,” and the included NRC staff SE (ADAMS Accession No. ML19178A130) accepted for use the noble metal chemical addition (NMCA) process and hydrogen water chemistry (HWC), moderate (HWC-M), as bases for claiming relief from certain BWRVIP inspections. As described in BWRVIP-62-A, NMCA is a process in which noble metal is added in batches to the reactor coolant system during refueling outages, and small amounts of hydrogen are continuously injected during plant operation. The NRC staff SE for BWRVIP- 62-A, accepted for use three criteria that plants applying noble metal chemistry must meet to demonstrate mitigation of Intergranular stress corrosion cracking (IGSCC):

- 1) Measured electrochemical potential (ECP) less than or equal to -230 millivolts (mV).
- 2) Measured hydrogen-to-oxygen molar ratio greater than or equal to 3.

3) Measured catalyst loading greater than or equal to a specific proprietary value.

BWRVIP-62-A is referenced by other BWRVIP inspection and evaluation guidelines, and implementation of water chemistry in accordance with BWRVIP-62-A is credited to reduce the inspections identified in those documents.

By letter dated January 24, 2018, (Electric Power Research Institute - Status of BWRVIP-62 Revision and Inspection Relief for BWR Piping Welds and Internal Components with Hydrogen Injection, January 24, 2018 (ADAMS Accession No. ML18033A323)), the BWRVIP stated that the BWRVIP had issued the following interim guidance to its members:

U.S. plants utilizing all forms of HWC and crediting HWC shall meet the conditions and limitations of BWRVIP-62-A. In the case of plants utilizing OLNC [online noble metal chemistry], this means they shall meet the Category 3a NMCA parameters and implementation steps (including platinum loading) of Tables 3-5 and 3-8. This guidance is issued as NEI 03-08 'Needed' guidance.

Because OLNC is one method to introduce noble metal, plant-specific implementation of OLNC which demonstrates conformance with the performance criteria of BWRVIP-62-A can utilize the inspection credit as specified in sources referencing BWRVIP-62-A, consistent with the BWRVIP interim guidance provided in its January 24, 2018, letter to the NRC.

The licensee submittal dated December 16, 2019 did not identify the method of chemical mitigation for IGSCC as described above. Since there is a correlation between the chemical mitigation program implemented and the inspection frequency specified by the BWRVIP alternative, staff requires additional information to complete its review.

1. Identify the type of chemical mitigation method that is being implemented at Clinton.
2. Identify how the conditions and limitations of BWRVIP-62-A are being met. If the chemical mitigation method is OLNC, in addition provide information specific to the Category 3A NMCA parameters and implementation steps as described in the safety evaluation to the 2018 supplement to the BWRVIP-62-A report (ADAMS Accession No. ML18142A019).

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