

**From:** Green, Kimberly  
**Sent:** Friday, May 27, 2022 4:21 PM  
**To:** Taylor, Andrew Charles  
**Cc:** Wells, Russell Douglas; Buckberg, Perry  
**Subject:** Revised Request for Additional Information re Sequoyah Nuclear Plant Alternative Request RV-02 (EPID L-2022-LLR-0034)  
**Attachments:** Sequoyah RV-2 PIV RAIs L-2022-LLR-0034 Revised 5-27-22.pdf

Dear Mr. Taylor,

By email dated May 26, 2022, I transmitted a request for additional information (RAI) to you. During the clarification call, TVA asked if the information provided in page E3 adequately addressed the issue in Request EMIB-RAI-2(e). Upon further review, the NRC staff has determined that the information on page E3 of the submittal does provide sufficient information to address the staff's request. Therefore, the NRC is withdrawing EMIB-RAI-2(e).

Attached, please find a revised RAI in which EMIB-RAI-2(e) has been deleted and RAI EMIB-RAI-2(f) has been renumbered as EMIB RAI-2(e). The attached RAI supersedes the RAI that was transmitted to you yesterday.

A response to the attached RAI is requested by June 30, 2022.

If you have any questions, please contact Perry Buckberg.

On behalf of Perry Buckberg,  
Kimberly J. Green, Senior Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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Alternative Request RV-02 (EPID L-2022-LLR-0034)  
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**From:** Green, Kimberly

**Created By:** Kimberly.Green@nrc.gov

**Recipients:**

"Wells, Russell Douglas" <rdwells0@tva.gov>  
Tracking Status: None  
"Buckberg, Perry" <Perry.Buckberg@nrc.gov>  
Tracking Status: None  
"Taylor, Andrew Charles" <actaylor@tva.gov>  
Tracking Status: None

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**Options**

**Priority:** Normal  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**

REQUEST FOR ADDITIONAL INFORMATION  
REGARDING ALTERNATIVE REQUEST RV-02  
PRESSURE ISOLATION VALVE LEAKAGE  
TENNESSEE VALLEY AUTHORITY  
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-327 and 50-328  
EPID-L-2022-LLA-0034

**References**

1. Letter from Tennessee Valley Authority [TVA] to U.S. Nuclear Regulatory Commission (NRC), Sequoyah Nuclear Plant (SQN), Units 1 and 2, American Society of Mechanical Engineers Operation and Maintenance Code, Request for Alternative RV-02, dated March 15, 2022 (ADAMS Accession No. ML22074A315).
2. Summary of February 16, 2022, public pre-application meeting with Tennessee Valley Authority regarding a future submittal of a request for an alternative to requirements for addressing Pressure Isolation Valve Leakage (ADAMS Accession No. ML22048B785).

**Regulatory Basis**

The SQN Units 1 and 2 Inservice Testing Program implements the American Society of Mechanical Engineers (ASME) Operation and Maintenance Code as required by SQN Units 1 and 2 Technical Specification 5.5.6, "Inservice Testing Program," and Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(f). Subsection ISTC-3630 of the SQN Units 1 and 2 Operation and Maintenance Code of record requires PIV testing to verify their seat leakages within acceptable limits and states, "Valve closure before seat leakage testing shall be by using the valve operator with no additional closing force applied." In accordance with 10 CFR 50.55a(z)(2), the NRC staff may authorize an alternative to an ASME Code requirement if the licensee demonstrates that the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

**Requests for Additional Information**

**EMIB-RAI-1**

Alternative Request RV-02, Section V, in the subsection "Summary," first paragraph, states:

The proposed alternative would permit continued startup if the PIV [pressure isolation valve] could be demonstrated to have acceptable seat leakage following mechanical agitation. The valve would only be acceptable for normal operation for one cycle and only if the final PIV seat leakage met the TS [Technical Specification] leakage criteria. This alternative will apply to ISTC-3630 requirements as they relate to use of additional closing force to achieve PIV closure before seat leakage testing, ISTC-3630(f) requirements as they relate to corrective action following a failed seat leakage test, ISTC-5221(a)(1) requirements as they relate to demonstrating that a PIV check valve disc travel to its seat following cessation of flow, and ISTC-5224 requirements as they relate to retesting following any required corrective action before the valve is returned to service.

The licensee is requested to provide the following information:

- (a) Clarify how the mechanical agitation activity described in Alternative Request RV-02 relates to preconditioning.
- (b) Specify the general design, including manufacturer/vendor, for the current check valves within the scope of the request, and describe how mechanical agitation will provide sealing for the various check valve designs.

## **EMIB-RAI-2**

Alternative Request RV-02, Section VI, "Basis for Proposed Alternative," Item 2, "Description of the mechanical agitation to be used, if needed," states:

Mechanical agitation is performed using a tool appropriately sized for the valve in question and for the location of the valve. The primary consideration is that the tool should not deform the valve body. The impact surface of the tool should be relatively large (greater than 1/2" diameter is preferred), and approximately flat or slightly rounded. The tool will contact the valve body surface so that it does not impact the body with an edge or sharp point. If available, a rubber coated tool may be used. In cases where there is limited access, a power-operated tool may be used provided the same precautions discussed above can be used. Agitation should be applied incrementally, starting with minimal force, and may be applied to different locations on the body, until either the disc is freed, or the plant determines agitation will not be successful. Because this activity does not lend itself to quantifiable parameters, the task is performed using the skill of the craft within the limitations discussed above. Because mechanical agitation is not a repair or replacement activity, this alternative is needed to avoid potential unnecessary emergent demands on plant equipment, resources, and personnel.

The licensee is requested to provide the following information:

- (a) Describe any experience with mechanical agitators at Sequoyah or other plants if known.
- (b) Specify the size of the actual mechanical agitators used on the 2-inch through 10-inch valves at Sequoyah if applied in the past.
- (c) Specify and describe the procedures that have been established to control the mechanical agitation activity such that the hand-operated and power-operated tools will not damage the valve seat, valve stem or pressure boundary function, etc.
- (d) Describe the weak link analysis that has been performed to verify that the mechanical agitation activity will not damage the check valves.
- (e) Specify any available standard, or industry or vendor guidelines, that will be used in applying the mechanical agitators.

### **EMIB-RAI-3**

Alternative Request RV-02, Section VI, Item 1, "Review of Maintenance History of the PIVs," states, in part:

#### 6" inclined seat swing check valves

PIV leak test history has been generally satisfactory (leakage present on 27.8% of tests on SQN Unit 1 and 30.3% on SQN Unit 2 - no as-left failures).

#### 10" vertical seat swing check valves

PIV leak test history has improved in the last few outages and acceptable leak rates have been obtained in all cases (leakage present on 52.8% of tests on SQN Unit 1 and 75% on SQN Unit 2 - no as-left failures).

The licensee is requested to provide the following information:

- (a) Provide the evaluation of the cause of this high occurrence of leakage for the 6-inch and 10-inch check valves.
- (b) Provide the leakage rate history for 8-inch PIVs and describe the evaluation of the leakage rates.

### **EMIB-RAI-4**

Alternative Request RV-02, Section VI, Item 3, "Design of the PIV check valves," discusses the failures of PIVs at Sequoyah.

The licensee is requested to provide the following information:

- (a) Discuss if any PIVs experienced any subsequent physical damage or degradation after a mechanical agitator was applied.
- (b) Describe the evaluation of the design of each check valve to demonstrate that if a valve initially fails its leak rate test and the alternative is applied, there is no reasonable potential for disk separation or failure that might impede flow if the valve must open to perform its safety function.

### **EMIB-RAI-5**

Alternative Request RV-02, Section IV, "Reason for Request," states, in part:

Most PIVs tested at the lower pressures met the leakage rate acceptance criteria when correlated to RCS pressure. However, some PIVs have required a higher test pressure (up to nominal RCS pressure) in order to achieve acceptable leakage results. Test procedures are written to allow testing at low or higher pressures.

The licensee is requested to provide the following information:

Describe how the method to be used when implementing Alternative Request RV-02 will

continue to meet ASME OM Code, paragraph ISTC-3630, "Leakage Rate for Other Than Containment Isolation Valves," subparagraph ISTC-3630(b), "Differential Test Pressure," and subparagraph ISTC-3630(e), "Analysis of Leakage Rates," while performing PIV leakage testing at a lower pressure.

#### **EMIB-RAI-6**

Alternative Request RV-02, Section V, "Proposed Alternative," in the subsection "Description of the Proposed Alternative," states, in part, that PIVs that have been mechanically agitated and subsequently passed seat leakage testing, will be repaired, or replaced during the next refueling outage.

In order to support to the long-term effectiveness of Alternative Request RV-02, please discuss any plans to leak test these PIVs before they are disassembled and inspected at the next refueling outage prior to commencing with their repair or replacement to determine if agitation caused any adverse effects on valve performance.

#### **EMIB-RAI-7**

Alternative Request RV-02, Section VI, "Basis for Proposed Alternative," Item 4, "Description of Preventive Maintenance of the PIVs," first paragraph, states, "Each unit has a scoping preventive maintenance (PM) to evaluate and identify PIVs to recommend for inspection and repair (or replace) for an upcoming refueling outage."

Please explain this statement in light of the requirement under Alternative Request RV-02 that all PIVs that have been mechanically agitated must undergo repair or replacement, and retesting, at the next refueling outage.

#### **EMIB-RAI-8**

Alternative Request RV-02, Section VI, Item 5, "Description of PIV Open Exercise Testing," states in part:

While total pump design flow is instrumented and measured during every comprehensive pump test, flow through each individual injection line is instrumented and measured on an alternating basis in accordance with the check valve condition monitoring plan.

The licensee is requested to describe the ASME OM Code Appendix II check valve condition monitoring plan referenced in this item.

#### **EMIB-RAI-9**

During the pre-submittal meeting on February 16, 2022, the licensee indicated that recent operating experience has heightened TVA's awareness that mechanical agitation can lead to adequate valve sealing in addition to recent similar experience during the last Sequoyah Unit 2 outage. Please describe this experience during the last Sequoyah Unit 2 outage referenced in this meeting, and its impact on the provisions in Alternative Request RV-02.