

MEETING WITH ENTERGY OPERATIONS, INC. OF PROPOSED ALTERNATIVE
EXAMINATION OF STEAM GENERATOR WELDS FOR ARKANSAS NUCLEAR ONE, UNITS 1
AND 2 (L-2024-LLR-0038)

TOPICS OF DISCUSSION

PROPOSED ALTERNATIVES ANO1-ISI-24-01 AND ANO2-ISI-24-01
ALTERNATIVE EXAMINATION OF STEAM GENERATOR WELDS

ENTERGY OPERATIONS, INC.

DOCKET NOS. 50-313 AND 50-368

JANUARY 28, 2025

BACKGROUND

By letter dated June 6, 2024 (Agencywide Documents Access and Management System Accession No. ML24158A389), Entergy Operations, Inc. (Entergy, the licensee) requested Nuclear Regulatory Commission (NRC) approval of proposed alternatives for Arkansas Nuclear One, Units 1 and 2 (ANO-1 and ANO-2, respectively). Alternative Requests ANO1-ISI-24-01 and ANO2-ISI-24-01 are to defer the inservice inspection (ISI) examinations for select examination categories and item numbers for the steam generators (SG) at ANO-1 and ANO-2 from the current inspection requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI to the end of operating licenses.

By letter dated October 16, 2024 (ML24290A098), the licensee responded to NRC Request for Additional Information (RAI).

Below are topics of discussion regarding the licensee's supplemental information dated October 16, 2024.

REGULATORY BASIS

The SG pressure-retaining welds and nozzles are ASME Code Class 1 and Class 2 components, with inservice inspections (ISIs) performed in accordance with the applicable edition of Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the ASME Code, as required by 10 CFR 50.55a(g).

The regulations in 10 CFR 50.55a(g)(4) state, in part, components that are classified as ASME Code Class 1, 2, and 3 must meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components.

The regulations in 10 CFR 50.55a(z) state, in part, that alternatives to the requirements in paragraphs (b) through (h) of 10 CFR 50.55a may be used when authorized by the NRC if the licensee demonstrates that: (1) the proposed alternative would provide an acceptable level of quality and safety, or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

DISCUSSION TOPIC 1

In its response to RAI Question 2(a), in letter dated October 16, 2024, the licensee proposed a performance monitoring plan for the requested alternative for ANO-1 and ANO-2 that includes crediting inspections at Waterford. The licensee proposed inspection sample is not sufficient to justify the requested alternative because the number of proposed inspections would be less than 25% of the examinations required to be conducted over the length of the requested alternatives at all units. In its RAI response, the licensee stated that its performance monitoring plan will examine 6 of 15 components totaling 40% of the entire population of the welds of interest. The staff noted that the licensee's approach is not consistent with the staff's position for performance monitoring plans. The staff's position is that the performance monitoring plan (i.e., examined welds) needs to be linked and converted to the SG Equivalent as described in the approved alternative requests for other nuclear plants that result in inspections of at least 25% of SG welds. The number of welds that are proposed to be examined and the required number of welds to be examined for the numbers of the intervals should have been converted to the SG Equivalent. Based on the staff calculation, the proposed welds to be examined are less than 25% of the required sample population. The staff's position on performance monitoring was discussed during a January 30, 2023, public meeting (meeting summary in ML23033A666 and presentation slides in ML ML23033A667). The examples of an adequate inspection sample size based on whole components (i.e., whole SGs) for similar alternative requests that the staff has approved in the past are documented in NRC safety evaluations for Duke Energy and Constellation fleet submittals in ML23256A088 and ML24179A326, respectively.

The staff determined that the licensee needs to provide a technical justification describing the minimum sample size, utilizing calculations of SG Equivalents according to the staff position, or other methodology as least as conservative as the staff position, in the proposed performance monitoring plan that is necessary to provide a 25% or greater sampling. That justification should include a description of how the sample size is consistent with - or if using a different methodology, at least as conservative as - the documented staff position for acceptable levels of performance monitoring demonstrated by the precedents previously provided, as noted above.

DISCUSSION TOPIC 2

In its response to RAI Question 2(a) dated October 16, 2024, the licensee proposed to use the SG weld examinations at Waterford Unit 3 as part of the performance monitoring plan for Alternative Requests ANO1-ISI-24-01 and ANO2-ISI-24-01. By letter dated March 18, 2024, (ML24078A376), the licensee submitted alternative request WF3-RR-24-02 for SG weld examination at Waterford. By letter dated September 24, 2024 (ML24268A296), the licensee stated that it plans to examine a total of five SG welds and nozzle inner radii (NIR) at Waterford during the fifth and sixth ISI intervals. The NRC noted that the Waterford SG examination plan is not part of the original ANO alternative request submittal. The Waterford and ANO alternative requests are reviewed and decided separately by the staff.

The staff determined that the licensee needs to provide a description of the SG examination plans at ANO-1 and ANO-2 should, for any reason, the referenced Waterford examinations do not occur as planned or the Waterford examination information is not available.

DISCUSSION TOPIC 3

In its response to RAI Questions 2(c) and 2(d) dated October 16, 2024, the licensee stated that additional examinations will be conducted according to the rules of the ASME Code, Section XI, IWB-2430. These Section XI paragraphs provide rules regarding selecting additional examination locations during the same outage and for the reactor unit when/where the flaw was discovered. However, the licensee's response does not address potentially expanding examination scope beyond the reactor unit where the original flaw is found. If unacceptable flaws were detected during examinations at Waterford, which the licensee proposes to credit for the ANO alternative request, the underlying premise that degradation is appropriately modeled in the EPRI reports as referenced in the alternative request cannot be verified for ANO without further information. Scope expansion is an important part of demonstrating an acceptable level of quality and safety to support the licensee's alternative requests because scope expansion establishes extent of condition for any unexpected degradation discovered during the proposed alternative examination schedules. Examples of previously approved inspection sample expansion scope beyond the reactor unit can be found in the following references (1). Duke Energy response to staff's RAI-1 (c) and (d) in its letter dated July 20, 2023 (ML23201A140), (2) NRC safety evaluation for Duke Energy fleet (ML23256A088), (3). NRC safety evaluation for Vogtle nuclear plant (ML20352A155), and (4) NRC safety evaluation for Constellation fleet (ML24179A326).

The staff determined that the licensee needs to provide clarification regarding whether it intends to perform additional examinations of the subject SG welds and NIR beyond the reactor unit where unexpected degradation was found as part of the proposed alternative examination schedules. If the licensee does intend to expand scope to other reactor units, the licensee needs to describe the timing and number of additional examinations. If the licensee does not intend to expand scope of inspection to other reactor units, the staff determined that the licensee needs to provide justification on how the proposed alternative requests address extent of condition for unexpected degradation.

DISCUSSION TOPIC 4

In its response to RAI Questions 2(c) and 2(d) dated October 16, 2024, the licensee stated that it will address indications that exceed the applicable ASME Code, Section XI acceptance standards of IWB-3500, and the number of additional examinations will be the number required by ASME Section XI, IWB-2430. The licensee also proposed to include the inspection of SG components at Waterford to support the ANO proposed alternative which include Class 2 components. The NRC staff noted that IWB-2430 and IWB-3500 are applicable to Class 1 components only. The ASME Code, Section XI, IWC-2430 and IWC-3500 are applicable to Class 2 components.

The staff determined that the licensee needs to confirm that it will follow the requirements of the ASME Code, Section XI, IWC-2430 and IWC-3500 for the examination of the SG welds and nozzle inner radii that are ASME Class 2 components.