



# **POLICY ISSUE**

## **(Information)**

July 21, 2023

SECY-23-0061

FOR: The Commissioners

FROM: Daniel H. Dorman  
Executive Director for Operations

SUBJECT: CLARIFICATION OF THE STAFF'S POSITION ON CERTAIN  
AMERICAN SOCIETY OF MECHANICAL ENGINEERS CODE  
ALTERNATIVES FOR MORE THAN ONE 10-YEAR INSERVICE  
INSPECTION INTERVAL UNDER TITLE 10 OF THE *CODE OF  
FEDERAL REGULATIONS* 50.55a

### PURPOSE:

This paper informs the Commission of a regulatory practice concerning the staff's review of certain American Society of Mechanical Engineers (ASME) Code alternatives for more than one 10-year inservice inspection (ISI) interval under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a, "Codes and standards."

### SUMMARY:

The staff is submitting this paper to explain the application of this regulatory practice given direction provided by the Commission, addressed below, with respect to other aspects of 10 CFR 50.55a, as well as its relationship to guidance provided in Office of Nuclear Reactor Regulation office instruction LIC-102, "Review of Relief Requests, Proposed Alternatives, and Requests to Use Later Code Editions and Addenda" (Agencywide Documents Access and Management System Accession No. ML18351A218) and other industry guidance. Additionally, staff will provide examples of where this practice has been used to address the approval of

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specific, narrowly focused ASME Code alternative requests for multiple ISI intervals while not impacting plant safety. The staff will also provide its assessment of how this practice is in keeping with 10 CFR 50.55a and the Commission's direction for requiring licensees to periodically update their ISI Code of Record, including an example of a licensee that asked to extend the use of this regulatory practice.

#### BACKGROUND:

Regulations in 10 CFR 50.55a establish requirements regarding the implementation of consensus Codes and Standards by commercial light water nuclear reactor licensees. In particular, 10 CFR 50.55a requires subject licensees to implement an ISI program in accordance with Section XI, Division 1 of the ASME Code. The ASME Code, Section XI, Division 1 framework was developed around the concept of a 10-year ISI interval, which is a 10-year span in which a licensee would perform a complete cycle of ISI activities for all ASME Code components. Therefore, a 40-year reactor operating license encompasses four 10-year ISI intervals.

Over the decades that ASME Code, Section XI, Division 1 has existed, the ASME Code has been regularly updated to incorporate revised ISI requirements and to publish new editions of Section XI, Division 1. The U.S. Nuclear Regulatory Commission (NRC) reviews and endorses the use of new editions of ASME Code, Section XI, Division 1 in 10 CFR 50.55a. Regulations in 10 CFR 50.55a(g)(5) set forth requirements for updating ISI programs. Furthermore, 10 CFR 50.55a(g)(4)(ii) requires, 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 [Section 50.55a] 18 months before start of the 120-month inspection interval.

The Commission, in Staff Requirements Memorandum (SRM)-SECY-00-0011, "Evaluation of the Requirement for Licensees to Update their Inservice Inspection and Inservice Testing Programs Every 120 Months," (ML003702722), directed the staff to maintain the then-current requirement that licensees update their ISI and inservice testing programs every 10 years to the latest edition of the ASME Code that is incorporated by reference in NRC regulations. More recently, in response to SECY-21-0029, "Rulemaking Plan on Revision of Inservice Testing and Inservice Inspection Program Update Frequencies Required in 10 CFR 50.55a" (ML21312A490), the Commission authorized the staff to propose a change to 10 CFR 50.55a that would effectively require licensees to update to a new edition of Section XI, Revision 1 in every other ISI interval (i.e., every 20 years).

In addition, 10 CFR 50.55a(z) provides, in part, that:

*Alternatives to codes and standards requirements.* 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. A proposed alternative must be submitted and authorized prior to implementation. The applicant or licensee must demonstrate that:

(1) *Acceptable level of quality and safety.* The proposed alternative would provide an acceptable level of quality and safety;[.]

Thus, this regulatory provision enables a process for licensees to seek authorization to implement alternatives to the requirements of the Codes and Standards to which they are licensed.

In the mid-1990s the NRC staff reviewed topical report BWRVIP-05, "BWR Vessel and Internals Project [BWRVIP], BWR Reactor Pressure Vessel Shell Weld Inspection Recommendations (BWRVIP-05)" (ML19311B831, not publicly available). The staff determined that the risk-informed technical basis provided by the industry in BWRVIP-05 was adequate for the staff to determine that the proposed alternative (i.e., permanent relief from the ASME Code requirements for the volumetric examination of circumferential reactor pressure vessel shell welds) met the standard of providing for "an acceptable level of quality and safety" for up to the period of the remaining current licensed life of the facility. Subsequently, on November 10, 1998 (ML031110082), the staff issued NRC Generic Letter (GL) 98-05, "Boiling Water Reactor Licensees Use of the BWRVIP-05 Report to Request Relief From Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds," to inform addressees that the NRC staff had completed its review of BWRVIP-05 and that licensees of boiling water reactors (BWRs) could request permanent (i.e., for the remaining term of operation under the existing, initial license) relief from the ISI requirements of 10 CFR 50.55a(g) for the volumetric examination of circumferential reactor pressure vessel (RPV) welds. GL 98-05 provided two explicit criteria:

BWR licensees may request permanent (i.e., for the remaining term of operation under the existing, initial, license) relief from the inservice inspection requirements of 10 CFR 50.55a(g) for the volumetric examination of circumferential reactor pressure vessel welds (ASME Code Section XI, Table IWB-2500-1, Examination Category B-A, Item 1.11, Circumferential Shell Welds) by demonstrating that: (1) at the expiration of their license, the circumferential welds will continue to satisfy the limiting conditional failure probability for circumferential welds in the staff's July 30, 1998, safety evaluation, and (2) licensees have implemented operator training and established procedures that limit the frequency of cold over-pressure events to the amount specified in the staff's July 30, 1998, safety evaluation. Licensees will still need to perform their required Inspections of "essentially 100 percent" of all axial welds.

Licensees made requests for approvals of alternatives under 10 CFR 50.55a(a)(3)(i) (the requirements in former paragraph (a)(3) were moved to 10 CFR 50.55a(z)(1) (79 Fed. Reg. 65,776, 65792 (November 5, 2014)), and the staff authorized such requests after finding that the criteria of GL 98-05 were met and that "the proposed alternative provides an acceptable level of quality and safety" (e.g., LaSalle (ML033300147)). Approval of a GL 98-05 request eliminated the need for a licensee to reapply for the same alternative in every successive inspection interval. However, because the initial approvals were limited to a 40-year license, BWR licensees have reapplied to extend the approval for an additional 20 years (two additional ISI intervals) when entering periods of extended operation (e.g., Monticello (ML110200700)). Pressurized water reactors (PWRs) have been approved for similar RPV inspection program alternatives related to topical report WCAP-16168, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval" (e.g., Oconee (ML21281A141)).

In another example, the industry developed certain permanent repair options for specific component configurations which, while acceptable to the staff, required the approval of alternatives to ASME Code requirements incorporated by reference into 10 CFR 50.55a (e.g., Palo Verde (ML062300333) and Shearon Harris (ML16343A220)). The "half nozzle repair" (see

Figure 1-1) provides for the reliable repair of a flawed location by moving the weld (which comprises the pressure boundary) from the inside diameter of a component (right of figure) to the outside diameter (left of figure). However, contrary to ASME Code, Section XI requirements (currently IWA-4611.1(a) and previously IWA-4310), this repair option leaves the flaw in the original weld in place. Hence, these licensees sought relief by requesting an alternative under 10 CFR 50.55a(z)(1) (or previously 10 CFR 50.55(a)(3)(i)) to leave the defects (flaws) in place. These licensees submitted a technical evaluation demonstrating that leaving the flaw in the original weld would not challenge the integrity of the component (i.e., the flaw would not grow from the weld into the associated base material) for the current licensed life of the plant. The submittals asserted that the alternative would provide an acceptable level of quality and safety for the remaining ISI intervals of the current license. In both of these cases the licensees made the requisite safety demonstrations, and the staff authorized the alternative on a permanent basis with the expectation that the licensees will not repeat the request in future ISI intervals, even if the requirement in ASME Code, Section XI is updated (as incorporated by reference into 10 CFR 50.55a).

In hindsight, the staff acknowledges that the documentation of its regulatory bases associated with approving complex examples like those noted above has not always been clear. For example, the Shearon Harris (ML1634A220) alternative request addressed multiple ASME Code provisions, some dealing with the process for conducting the repair as well as the aforementioned alternative for leaving the flaw in the original weld in place. In this case, the staff wrote its conclusion to state that it “authorizes the use of” the alternative (meaning to enable the process for installing the repair) for only a specific interval, while at the same time noting that the repaired locations are “acceptable to remain in service for the life of the plant.” The licensee’s request and the staff’s approval of the acceptability of the repair to remain in service for the life of the plant has been understood to address the fact that the licensee would leave the flaw in the original weld in place, but not have resubmit its alternative to IWA-4611.1(a) during future intervals.

To summarize, the staff has considered and approved such alternatives spanning multiple ISI intervals in select circumstances when: (1) the technical and safety basis provided by the licensee for the alternative was commensurate with the period of time for which it was requested (e.g., the amount of information provided by licensees to support a multi-interval alternative request being more robust than for a single interval); (2) the licensee has demonstrated that the “acceptable level of quality and safety” provided for by the alternative includes supporting information that adequately addresses the consideration of uncertainties associated with the multi-interval request; and (3) although the required ASME Code Editions and Addenda incorporated by reference into 10 CFR 50.55a as described in 10 CFR 50.55a(g)(4) will change in the future, an applicant’s or licensee’s demonstration of the “acceptable level of quality and safety” of a multi-interval alternative is a one-time demonstration that addresses the requested multiple intervals, and the demonstration is not invalidated by future changes to 10 CFR 50.55a and the ASME Code Editions and Addenda incorporated by reference therein. The latitude to implement such approvals has supported the NRC’s objective to be a more efficient, modern, risk-informed regulator.

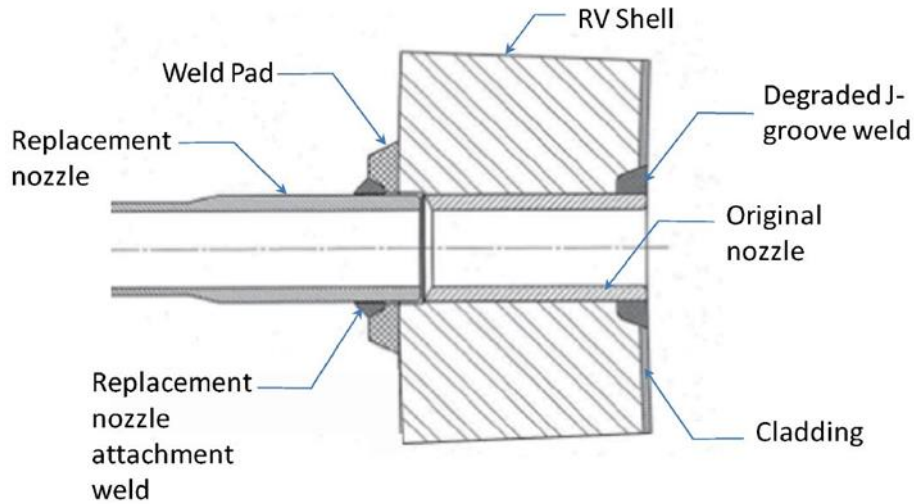


Figure 1-1: Schematics of Nozzle Replacement Implementation

### DISCUSSION:

The Commission has maintained the requirement for licensees to update their ISI programs periodically and has issued direction to the staff in SRMs 00-0011 and 21-0029 to this effect. The ASME Code, Section XI, Division 1 requirements span hundreds of pages and address requirements for hundreds to thousands of ASME Code Class components at commercial light water nuclear power plants. The staff asserts that accepting alternatives for review that effectively eliminate the requirement to update the ISI program requirements for a small fraction of components is consistent with the regulations and with Commission direction. Instead of eliminating the entire ISI program update requirement, a licensee's limited request would effectively eliminate the update requirement for only one component. If/when authorized, the licensee would not be required to request an alternative when the program is next updated. The staff has concluded that reviewing and authorizing (or denying on the merits) limited-in-scope requests for multi-interval alternatives that do not reset or expire at the next program update is consistent with the Commission's instructions to the staff on maintaining the overall program update requirements. Importantly, the staff's detailed and thorough review of such multi-interval alternative requests ensures that the technical bases for these requests demonstrate that their approval will have no adverse impact on plant safety.

The staff continues to receive a number of risk-informed submittals from licensees much like the BWRVIP-05 example discussed above, though these requests are still limited in scope. For example, some licensees are proposing to spread inspections required in one ISI interval over a time period of 20 years or more for the welds in the shell of the pressurizer or steam generator in PWR units. The staff is conducting detailed reviews of these requests on a case-specific basis.

The existing Office of Nuclear Reactor Regulation office instruction LIC-102 does not provide explicit guidance on how and when to accept multi-interval requests for alternatives under 10 CFR 50.55a for review. Industry's current guidance, which the staff has cited or favorably discussed in past NRC documents, states that alternatives must be resubmitted at each

program update.<sup>1</sup> The staff is considering the best approach on how to update the NRC's guidance on reviewing limited-in-scope and multi-interval requests in order to further transparency and consistency in future reviews.

CONCLUSION:

Consistent with the discussion above, the staff intends to continue to implement its regulatory practice concerning the approval of certain ASME Code alternatives for more than one 10-year ISI interval on a limited, case-by-case basis when the technical bases supporting the requested alternative ensure that an acceptable level of quality and safety will be maintained. As necessary, the staff will update the NRC's guidance on reviewing limited-in-scope and multi-interval requests in order to further transparency and consistency in future reviews.

COORDINATION:

The Office of the General Counsel reviewed this paper and had no legal objection.

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for Operations

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<sup>1</sup> Nuclear Energy Institute (NEI) White Paper, Revision 1, "Standard Format for Requests from Commercial Reactor Licensees Pursuant to 10 CFR 50.55a," Revision 1, dated June 7, 2004 (ML070100400). Section 2.6 of NEI's paper discusses re-approval of requests under a new 10-year interval.

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