

UNITED STATES
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OFFICE OF NEW REACTORS
OFFICE OF NUCLEAR REACTOR REGULATION
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NRC REGULATORY ISSUE SUMMARY 2012-08: DEVELOPING INSERVICE TESTING
AND INSERVICE INSPECTION
PROGRAMS UNDER 10 CFR PART 52

ADDRESSEES

All current and potential applicants for and holders of a combined license (COL) or standard design certification for a nuclear power plant under the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

INTENT

The U.S. Nuclear Regulatory Commission (NRC) is issuing this regulatory issue summary (RIS) to describe an acceptable approach for COL holders (licensees) with respect to the requirements in 10 CFR 50.55a, "Codes and standards," regarding development of inservice inspection (ISI) and inservice testing (IST) programs during the initial 120-month program interval following plant startup. In addition, this RIS discusses acceptable approaches for developing preservice inspection programs and Risk-Informed ISI and IST programs. This RIS does not transmit any new requirements and does not require any specific action or written response.

BACKGROUND INFORMATION

The regulations in 10 CFR 50.55a(f)(4)(i) and (g)(4)(i) require, in part, that inservice tests to verify the operational readiness of safety-related pumps and valves and inservice examinations of components and system pressure tests conducted during the initial 120-month testing and inspection interval must comply with the requirements in the latest edition and addenda of the American Society of Mechanical Engineers (ASME) *Boiler & Pressure Vessel Code* (B&PV Code) and ASME *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code) incorporated by reference in 10 CFR 50.55a, on the date that occurs 12 months before the date scheduled for initial loading of fuel under a COL issued under 10 CFR Part 52 (or the optional ASME Code cases listed in NRC Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," and RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," that are incorporated by reference in 10 CFR 50.55a).

In addition, the NRC regulations in 10 CFR 52.47(a)(3)(i) require, in part, that a design certification application must contain the principal design criteria for the facility. Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 establishes minimum requirements for the principal design criteria. General Design Criteria (GDC) 32, 36, 37, 39, 40, 42, 43, 45, and 46 require that components and systems important to safety shall be designed

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to permit appropriate periodic inspection of important components to assure their integrity and capability of the system and to permit periodic pressure and functional testing to assure (1) the structural and leak-tight integrity of its components, (2) the operability and performance of the active components of the system, and (3) the operability of the system as a whole. The periodic inspections and testing programs are required to meet the ASME B&PV and OM Codes, respectively, in accordance with 10 CFR 50.55a.

Lastly, the NRC regulations in 10 CFR 52.79(a)(11) require that the COL applicant describe the programs (such as ISI and IST programs) and their implementation, necessary to ensure that the systems and components meet the requirements in the ASME OM Code and ASME B&PV Code, Section XI. These operational programs are required to be fully described when the COL application is submitted to the NRC for review.

During the NRC staff's review of design certification and COL applications, several applicants expressed concerns in being able to fully comply with the above three NRC regulations because they perceived the requirements as providing overlapping requirements on establishing the applicable editions and addenda of the ASME B&PV and OM Codes to be used for the initial 120-month ISI and IST program intervals. This RIS describes how the NRC staff, design certification applicants, and COL applicants have addressed these requirements in the reviews of design certification and COL applications under 10 CFR Part 52.

SUMMARY OF ISSUE

The NRC regulations in 10 CFR Part 52 allow a two-step process for licensing new nuclear power plants where a Standard Design Certification is granted with subsequent issuance of a COL referencing the certified design. Under this process, the regulations in 10 CFR 52.47 require the design certification application to contain a level of design information sufficient to enable the Commission to judge the applicant's proposed means of assuring that construction conforms to the design and to reach a final conclusion on all safety questions associated with the design before the certification is granted. A Design Control Document (DCD) supporting a design certification application may provide general information on operational programs (such as ISI and IST programs) with allowance for flexibility by the COL applicant when developing plant-specific operational programs. The NRC staff reviews the general description of the operational programs in the DCD to ensure an adequate foundation for the plant-specific operational programs to be developed by COL applicants. With respect to IST programs, the NRC staff review of the DCD focuses on accessibility for the performance of IST activities. To reduce the amount of information needed in subsequent COL applications, some design certification applicants provide more detailed descriptions of ISI and IST operational programs in their DCDs than required by the NRC regulations for a design certification application.

The NRC regulations in 10 CFR 52.79(a)(11) require a COL applicant to provide, in its safety analysis report, a description of the programs and their implementation, necessary to ensure that the systems and components meet the requirements of the ASME B&PV and OM Codes in accordance with 10 CFR 50.55a at a level sufficient to enable the NRC to reach a final conclusion on all safety matters that must be resolved before COL issuance. In SECY-05-0197, "Review of Operational Programs in a Combined License Application and General Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria [ITAAC]," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML052770257) dated October 28, 2005, the NRC concluded that operational programs (such as ISI and IST programs) could be fully described in a COL application and recognized that some operational programs would not be available at the time of COL issuance. In accordance with this

guidance, the description of the program would contain the information necessary for the NRC staff to make a reasonable assurance finding on the acceptability of the operational program in the review of a COL application. This information would specify an edition and addenda of the ASME B&PV and OM Codes that would be the basis for the ISI and IST program described in the COL application. The NRC staff developed license conditions to provide certainty as to when the operational programs would be implemented in support of plant startup.

Following COL issuance, the NRC regulations in 10 CFR 50.55a(f)(4)(i) and (g)(4)(i) require, in part, that inservice tests to verify the operational readiness of safety-related pumps and valves and inservice examinations of components and system pressure tests conducted during the initial 120-month testing and inspection interval must comply with the requirements in the latest edition and addenda of the ASME B&PV and OM Codes incorporated by reference in 10 CFR 50.55a, on the date that occurs 12 months before the date scheduled for initial loading of fuel under a COL issued in accordance with 10 CFR Part 52 (or the optional ASME Code cases listed in NRC RG 1.147 and RG 1.192 that are incorporated by reference in 10 CFR 50.55a).

Several years may elapse between the time when a design certification is granted and when a COL application is submitted referencing that certified design. Further, the construction of a nuclear power plant will require several years from the time of COL issuance until the commencement of fuel loading. Therefore, design certification and COL applicants and holders need to be aware of the interrelated requirements in 10 CFR 50.55a and 10 CFR Part 52 regarding the development and implementation of ISI and IST programs for nuclear power plants to be licensed under 10 CFR Part 52.

Design Certification and COL Applicants

The NRC regulations in 10 CFR 52.79(a)(11) require that the COL applicant describe the ISI and IST programs and their implementation, necessary to ensure that the systems and components meet the requirements in the ASME B&PV Code, Section XI and ASME OM Code. NRC RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," and SECY-05-0197 provide guidance for COL applicants in describing their ISI and IST programs in support of the COL applications. As part of its description of the ISI and IST programs, the COL applicant must identify the edition and addenda of the ASME B&PV Code, Section XI and ASME OM Code, to be used in developing its ISI and IST programs, respectively. In some cases, it may be the same edition and addenda used in the design certification. In other cases, it may be the latest edition and addenda of the ASME OM Code or ASME B&PV Code, Section XI, incorporated by reference in 10 CFR 50.55a at the time of the COL application. In describing ISI and IST programs, COL applicants should recognize that the NRC regulations in 10 CFR 50.55a require updating of ISI and IST programs prior to fuel loading. Design certification applicants should also be aware of this 10 CFR 50.55a requirement when describing ISI and IST programs in their DCDs for reference by COL applicants.

COL Licensees

After the COL is issued, the COL licensee will initiate development of the ISI and IST programs to allow implementation of those programs in preparation for plant operation. During development of the ISI and IST programs, the COL licensee should be aware of the NRC regulations under 10 CFR 50.55a(f)(4)(i) and (g)(4)(i) that require the COL licensee to develop its initial 120-month interval ISI and IST programs using the latest edition and addenda of the ASME B&PV Code, Section XI and ASME OM Code, incorporated by reference in

10 CFR 50.55a(b) on the date that occurs 12 months before the date scheduled for initial loading of fuel. Therefore, the COL licensee should anticipate that the ASME B&PV and OM Codes might be revised to incorporate industry operating experience and technological advances prior to fuel loading for its nuclear power plant.

NRC Staff Position

The NRC staff recognizes that a COL licensee might encounter significant logistical and scheduling issues when converting its ISI and IST programs from the edition and addenda of the ASME B&PV and OM Codes specified in the COL application to the edition and addenda of these codes incorporated by reference in 10 CFR 50.55a on the date that occurs 12 months before fuel loading.

The NRC regulations in 10 CFR 50.55a(a)(3) allow alternatives to the requirements of 10 CFR 50.55a to be used if the applicant demonstrates that (1) the proposed alternative would provide an acceptable level of quality and safety, or (2) compliance with the specified requirements of 10 CFR 50.55a would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, a COL licensee may request authorization by the NRC staff to use an edition and addenda of the ASME OM Code for developing its initial 120-month IST program that is earlier than that required under 10 CFR 50.55a(f)(4)(i) and, similarly, to use an edition and addenda of the ASME B&PV Code, Section XI, for developing its initial 120-month ISI program that is earlier than that required under 10 CFR 50.55a(g)(4)(i).

One acceptable approach would be for the COL licensee to submit to the NRC a request to authorize, as an alternative, the use of the same edition and addenda of the ASME OM Code or ASME B&PV Code, Section XI, that was specified in the design certification or COL application for the initial 120-month IST and ISI programs. In its request for authorization of an alternative, the COL licensee would need to demonstrate that it meets one of the conditions described in 10 CFR 50.55a. In addition, a COL licensee may request exemptions or departures for ISI and IST programs in accordance with Section VIII, "Processes for Changes and Departures" which is located in each of the Appendices A-D of Part 52.

When evaluating a proposed alternative under 10 CFR 50.55a, the NRC staff will compare the ISI and IST provisions in the proposed code edition and addenda to the required edition and addenda of these codes incorporated by reference in 10 CFR 50.55a on the date that occurs 12 months before fuel loading. As part of its review, the NRC staff will evaluate the differences between the ISI and IST provisions in those respective code editions and addenda. The NRC staff will also consider whether the alternative enables the testing and inspections applicable to NUREG-0933 generic safety issues and operational lessons learned that are incorporated into the design under 10 CFR 52.47(a)(21) and (22). Therefore, the design certification and COL applicants should consider the edition and addenda of the ASME OM Code and ASME B&PV Code, Section XI, specified in the descriptions of the IST and ISI programs in their design certification and COL applications, and whether those code editions and addenda reflect lessons learned from operating experience at nuclear power plants (including IST and ISI activities) and industry and regulatory research programs that will be incorporated into later code addenda and editions.

Preservice Inspection Using ASME B&PV Code, Section III

The NRC staff has received inquiries from design certification and COL applicants about the edition and addenda of ASME B&PV Code, Section III that they should use for developing a

preservice inspection (PSI) program. The NRC regulations in 10 CFR 50.55a(g)(3)(i) and (ii) require, in part, that Class 1, 2, and 3 components and their supports must meet the preservice examination requirements set forth in the editions and addenda of Section III or XI of the ASME B&PV Code (or ASME OM Code for snubber examination and testing) incorporated by reference in 10 CFR 50.55a that apply to the construction of the particular component. A design certification applicant may specify the edition and addenda of Section III of the ASME B&PV Code that has been incorporated by reference in 10 CFR 50.55a for the design of its Class 1, 2, and 3 components. A COL licensee may use this same edition and addenda of Section III to develop its PSI program. However, COL applicants may also specify the latest edition and addenda of ASME B&PV Code, Section III that is incorporated by reference in 10 CFR 50.55a to minimize the differences in preservice examination requirements when developing the ISI program pursuant to 10 CFR 50.55a(c)(3), (d)(2), and (e)(2).

For its initial 120-month interval, a COL licensee may submit to the NRC a request to authorize an alternative to use a different edition and addenda of ASME B&PV Code, Section XI, than that required by 10 CFR 50.55a(g)(3)(i), for developing its PSI program. According to 10 CFR 50.55a, the COL licensee would need to demonstrate that (1) this edition and addenda of ASME B&PV Code, Section XI, would provide an acceptable level of quality and safety, or (2) compliance with the specified requirement to use the latest edition and addenda would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Risk-Informed ISI and IST Programs

On several occasions, the NRC staff has been asked to define its position on Risk-Informed IST and ISI program submittals during the COL application process. A COL applicant or licensee may submit Risk-Informed ISI and IST programs for NRC staff review and authorization as an alternative to the regulations as described in 10 CFR 50.55a. The COL applicant or licensee will need to satisfy the requirements for authorization of an alternative as specified in 10 CFR 50.55a.

The NRC staff recommends that a conventional ISI or IST program be in place or developed before preparing a Risk-Informed ISI or IST program to facilitate the evaluation of the acceptability of the alternative program. This recommendation is based solely on the fact that the existing design certification applications, the Standard Review Plan acceptance criteria, the applicable NUREG documents, and the COL applications conform to the premise that conventional ISI/IST programs have been developed prior to a Risk-Informed program. No regulation requires that a conventional ISI or IST program be developed prior to a Risk-Informed ISI or IST program submission as an alternative. However, the NRC staff considers this approach to provide the most expedient course for review and approval of a Risk Informed ISI or IST program.

BACKFIT DISCUSSION

This RIS clarifies current regulatory requirements and provides voluntary options that a COL licensee may propose. The RIS imposes no new requirements and necessitates no action or written response. Therefore, it does not constitute a backfit under 10 CFR 50.109, "Backfitting," and the staff did not perform a backfit analysis.

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment on this RIS was published in the *Federal Register* (77 FR 12089) on 02/28/2012. No public comments were received.

CONGRESSIONAL REVIEW ACT

In accordance with the Congressional Review Act, the NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs of the Office of Management and Budget (OMB).

PAPERWORK REDUCTION ACT STATEMENT

This RIS does not contain new or amended information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the OMB, approval numbers 3150-0011 and 3150-0151.

PUBLIC PROTECTION NOTIFICATION

The NRC may not conduct or sponsor, and a person is not required to respond to, an information collection unless the requesting document displays a currently valid OMB control number.

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Please direct any questions about this matter to the technical contact listed below or to the appropriate Office of New Reactors project manager.

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