

January 14, 2000

FOR: The Commissioners
FROM: William D. Travers /RA/
Executive Director for Operations
SUBJECT: EVALUATION OF THE REQUIREMENT FOR LICENSEES TO UPDATE THEIR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAMS EVERY 120 MONTHS

- [PURPOSE](#)
- [SUMMARY](#)
- [BACKGROUND](#)
- [DISCUSSION](#)
 - [Advisory Committee on Reactor Safeguards](#)
- [RESOURCES](#)
- [COORDINATION](#)
- [RECOMMENDATION](#)

PURPOSE

To respond to the Commission's directive in a staff requirements memorandum (SRM) dated June 24, 1999, to report the results of an evaluation of the regulatory requirement for nuclear power plant licensees to update their inservice inspection (ISI) and inservice testing (IST) programs every 120 months.

SUMMARY

The NRC regulations require nuclear power plant licensees to update their ISI and IST programs every 120 months to meet the provisions of a recent edition of the American Society of Mechanical Engineers (ASME) Code incorporated by reference in [10 CFR 50.55a](#). The NRC issued a proposed rule on April 27, 1999, to request public comment on a proposed modification of this update requirement. This Commission paper provides options and recommendations regarding this update requirement. The NRC staff recommends the establishment of the ISI/IST baseline requirements as the 1995 Edition with the 1996 Addenda of the ASME Code as currently incorporated by reference in 10 CFR 50.55a. Thereafter, licensees would be allowed to update their ISI and IST programs voluntarily to entire editions or addenda of the ASME Code as incorporated by reference in the regulations, unless new baseline requirements are established in accordance with [10 CFR 50.109](#). As is currently required by 10 CFR 50.55a, licensees will continue to be required to request approval for use of a portion of an endorsed edition or addenda of the ASME Code (other than that edition and addenda that form their baseline), unless that portion of the Code is specifically identified in the regulations for application independent of the entire edition or addenda. This recommendation is referred to as Option 1.B in this paper.

BACKGROUND

Since the 1970s, licensees of nuclear power plants have been required by 10 CFR 50.55a to update their ISI and IST programs every 120 months to meet the provisions of the edition and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a and in effect 12 months before the start of the new 120-month interval. The NRC established this requirement on the basis of the knowledge that the ISI and IST provisions in the ASME Code would be improved as experience was obtained from their application at nuclear power plants.

[Attachment 1](#) to this Commission paper provides additional details on the history of the 120-month ISI/IST update requirement.

On April 7, 1999, the staff briefed the Advisory Committee on Reactor Safeguards (ACRS) on its evaluation of the continued need for a requirement to update ISI and IST programs every 120 months. In a letter dated April 19, 1999, the ACRS recommended against eliminating the 120-month update requirement for ISI and IST programs. The ACRS comments and the staff's response to those comments are discussed later in this paper.

In a proposed rule published in the *Federal Register* on April 27, 1999, the NRC suggested the replacement of the 120-month ISI/IST update requirement with a provision which allows licensees to update their ISI and IST programs voluntarily beyond a set of baseline ISI and IST requirements to be established in the NRC regulations. The baseline proposed at that time was the 1989 Edition of the ASME Code. The NRC staff held a public workshop on May 27, 1999, to discuss the 120-month ISI/IST update requirement. The staff received numerous comments on the proposed rule from ASME, the Illinois Department of Nuclear Safety, the Nuclear Energy Institute (NEI), nuclear utilities, and private citizens. These comments are summarized in [Attachment 2](#) to this paper.

In an SRM dated June 24, 1999, the Commission directed the staff "to require the use of the 1995 Edition with the 1996 Addenda of the ASME Boiler and Pressure Vessel Code in the updating of [ISI and IST] programs for those licensees approaching their next 120-month ISI and IST program interval." The Commission then directed the staff to consider the need for the 120-month ISI/IST update requirement in a separate rulemaking. The Commission stated that the staff should

evaluate public comments received on the 120-month ISI/IST update requirement and discuss this issue further with the ACRS. The Commission also stated that the staff should evaluate the implications of introducing backfit considerations to 10 CFR 50.55a relative to ISI and IST program requirements if the 120-month update requirement is eliminated. The Commission directed that the staff report the results of these efforts, along with options and recommendations regarding the efficacy and desirability of eliminating the 120-month update provision.

After the SRM was issued, several commenters stated that the baseline for ISI and IST requirements should be established as the 1989 Edition of the ASME Code, Section XI (except for containment inspection, which should be the 1992 Edition with the 1992 Addenda as currently required in 10 CFR 50.55a). In addition, in a letter dated October 26, 1999, NEI reiterated this previously stated position on the ISI/IST baseline requirements. Several commenters, including certain utilities, suggested that some or all of the ISI and IST baseline requirements be based on more recent ASME Code versions than the 1989 Edition of the ASME Code. With the receipt of these comments since issuance of the SRM, the staff has included an evaluation of the 1989 Edition of the ASME Code as a possible baseline for ISI and IST requirements in this paper to allow the Commission to consider this option.

DISCUSSION

The NRC staff has reviewed comments provided by internal and external stakeholders regarding the continued need for a regulatory requirement that licensees update their ISI and IST programs every 120 months. From this review, the staff has identified three options with respect to updating ISI and IST programs:

- (1) Replace the 120-month ISI/IST update requirement with a baseline of ISI and IST requirements and allow voluntary updating to entire subsequent NRC-endorsed ASME Code editions and addenda without prior NRC approval unless the baseline is revised in accordance with 10 CFR 50.109, where the initial baseline will consist of one of the following three possible sets of ISI and IST requirements:
 - (A) The 1989 Edition of the ASME *Boiler and Pressure Vessel Code* (ASME BPV Code) for ISI of ASME Code Class 1, 2, and 3 components (including supports) and for IST of ASME Code Class 1, 2, and 3 pumps and valves; the 1992 Edition with the 1992 Addenda of Subsections IWE and IWL of the ASME BPV Code for ISI of Class MC and Class CC components and their integral attachments; the 1995 Edition with the 1996 Addenda of Appendix VIII of the ASME BPV Code, Section XI, with limitations and modifications specified in 10 CFR 50.55a (as discussed in the proposed rule dated April 27, 1999);
 - (B) The 1995 Edition with the 1996 Addenda of the ASME Code with the limitations and modifications specified in the NRC regulations, or
 - (C) A later version (e.g., the 1998 Edition) of the ASME Code with appropriate limitations and modifications.
- (2) Retain the current 120-month ISI/IST update requirement and the current regulatory provision that allows licensees to use portions of NRC-endorsed ASME Code editions or addenda provided that all related requirements of the respective editions are met.
- (3) Retain the 120-month ISI/IST update requirement and the current provision for use of portions of NRC-endorsed ASME Code editions or addenda, but develop explicit guidance for plant-specific alternatives to the ISI/IST update requirement.

Option 1 would replace the 120-month ISI/IST update requirement with a provision that allows voluntary updating if the selected baseline for ISI and IST requirements is not revised. The initial ISI and IST baseline requirements under Options 1.A, 1.B, and 1.C would focus principally on the 1989, 1995, or 1998 Edition of the ASME Code, respectively, with appropriate limitations and modifications. All licensees would be required to update their programs to the selected baseline edition and addenda of the ASME Code. There are two alternatives with respect to the timing of licensee updating: (1) to require all licensees to update by a date certain or within a specific period of time (i.e., 1 year after issuance of the rule); or (2) updating when their current 120-month ISI/IST programs are completed. At this time, the staff intends to specify that licensees update their ISI and IST programs to the initial baseline when their current 120-month ISI/IST programs are completed. Licensees would be allowed to voluntarily update their ISI and IST programs to entire editions and addenda of the ASME Code which are approved for use (endorsed) and incorporated by reference into 10 CFR 50.55a. Prior staff review and approval would not be necessary for licensees to voluntarily adopt ASME Code editions and addenda that are endorsed for voluntary use which are more recent than their licensing basis. Staff approval would be required if licensees were to slip back and choose to use an ASME Code edition or addenda which is older than their licensing basis at the time of the change. Licensees could request approval for use of a *portion* of an endorsed ASME Code edition or addenda pursuant to the provisions in 10 CFR 50.55a(a)(3) governing staff approval of alternatives. Finally, licensees could request approval under 10 CFR 50.55a(a)(3) for the use of all or portions of an ASME Code edition or addenda which have not been approved for use and incorporated by reference into 10 CFR 50.55a.

After establishment of the initial ISI/IST baseline through rulemaking, the NRC staff would continue to review subsequent ASME Code editions and addenda for either imposition as a mandatory requirement, or endorsement as a voluntary alternative which could be used by licensees without prior NRC review and approval (so long as the edition or addenda being selected is more recent than their licensing basis at the time of the change). Both mandatory imposition or endorsement for

voluntary use would ordinarily be accomplished through rulemaking. The staff would also evaluate whether specific ASME Code provisions (or groups of related provisions) should be mandated or endorsed for voluntary use based upon 10 CFR 50.109. The staff would also evaluate whether new ASME Code editions and addenda, when considered in the aggregate, should be adopted as a new baseline requirement based upon the 10 CFR 50.109 evaluation factors to be used for endorsing individual ASME Code provisions.

Option 2 would retain the 120-month ISI/IST update requirement to provide continued updating of ISI and IST programs every 120 months to incorporate the latest ISI and IST methods. This option would also retain the current regulatory provisions in 10 CFR 50.55a that allow licensees to use portions of ASME Code editions or addenda incorporated by reference in the regulations provided that all related requirements of the respective editions are met. The ASME consensus process does not explicitly evaluate the provisions of revised ASME Code editions and addenda in terms of safety or cost. However, the ASME standards writing committees include members from licensee organizations, design service organizations, and the NRC; and considerations of increased safety versus cost are implicit in the ASME consensus process. Under this option, licensees would continue to be required to update their ISI and IST programs to future ASME Code editions every 120 months.

Option 3 would retain the 120-month ISI/IST update regulatory requirement and the current provision for use of portions of NRC-endorsed ASME Code editions or addenda. This option is similar to Option 2, except that the staff would develop explicit guidance for the successful application of plant-specific alternatives to the ISI/IST update requirement pursuant to existing regulations in 10 CFR 50.55a(a)(3). Under Option 3, the licensee would be required to demonstrate that its current ISI and IST programs provide an acceptable level of safety in lieu of updating those programs to a more recent edition of the ASME Code incorporated by reference in the regulations.

In [Attachment 3](#) to this paper, the staff describes the options for the 120-month ISI/IST update requirement and compares the options through application of the Commission's performance goals of (1) maintaining safety, (2) increasing public confidence, (3) reducing unnecessary regulatory burden, and (4) making NRC activities and decisions more effective, efficient, and realistic.

Varied opinions exist among stakeholders, including the NRC staff, regarding the need for a mandatory ISI/IST update requirement. Comments from NRC staff members who believe that the 120-month ISI/IST update requirement should be maintained are incorporated into the discussion in [Attachment 3](#) to this paper. The staff has also responded to the comments provided by the ACRS on the 120-month ISI/IST update requirement. The staff does not consider any particular option to have an overwhelming advantage over the other options.

Based on consideration of the Commission's performance goals, the staff recommends implementation of Option 1.B as described in this paper. The application of an initial ISI/IST baseline of the 1995 Edition with the 1996 Addenda of the ASME Code is based principally on (1) the incorporation by reference of this ASME Code edition and addenda into the regulations on September 22, 1999, with the requirement that licensees update their ISI and IST programs at the next 120-month interval, and (2) the substantial improvements to the ASME Code since 1989 identified by staff review and public comments.

Regardless of the option taken for this rulemaking, the staff notes that use of risk-informed ISI and IST programs and development of ASME Code cases to implement these programs are being encouraged. In addition, the staff has a major initiative underway to revise 10 CFR Part 50 to be more effective in a risk-informed environment. The project includes rulemaking activities to reduce special treatment requirements in safety-related components of low safety significance. The staff is encouraging the standard-writing consensus committees (such as ASME) to participate in these industry and regulatory issues. ASME representatives have expressed the desire to be a part of these efforts. Further, the staff is evaluating the specifics of the ISI/IST process for areas of improvement. As an outgrowth of the activities to make 10 CFR Part 50 risk informed, the staff may propose additional improvements for the review and implementation of ISI and IST programs.

Advisory Committee on Reactor Safeguards

On December 2, 1999, the staff discussed with the ACRS the public comments received on the proposed rule, the options described in this paper, and the staff's recommendations regarding the ISI/IST update requirement. In its presentation to the ACRS, the staff recommended the implementation of Option 1.B. In a letter dated December 8, 1999, to Chairman Meserve, the ACRS recommended that the Commission adopt Option 2 and retain the 120-month update requirement for ISI and IST programs in 10 CFR 50.55a. The ACRS agreed with the staff that any of the options will maintain an acceptable level of safety. Based on its review of recent analyses, the ACRS considers ISI and, on a more qualitative basis, IST to have a relatively modest impact on core damage frequency. However, the ACRS notes that, because assurance of the integrity of the reactor coolant pressure boundary and the containment is one of the cornerstones of the NRC regulatory system, ISI and IST programs have been required to provide additional assurance, through application of the defense-in-depth philosophy, of the integrity of these barriers and to compensate for uncertainties. The staff believes that defense-in-depth is maintained without requiring licensees to routinely update their ISI and IST programs. ASME Code requirements (both in ASME BPV Code, Sections III and XI) contain inherent conservatism and margins that contribute to defense-in-depth. Requiring updating of ISI and IST programs to maintain defense-in-depth is considered inconsistent with our overall regulatory approach, in that we do not require periodic updating to new standards in other areas in order to maintain defense-in-depth unless the backfit provisions of 10 CFR 50.109 are satisfied.

The ACRS believes that the review of the past decade of experience presented by the ASME demonstrated that there were significant changes to the ISI, IST, and operations and maintenance requirements that improved the effectiveness and

efficiency of these programs and that developments in technology and operating experience could lead to additional changes in the inspection programs. While the staff agrees that there continue to be improvements to the ASME Code, we believe that recently these changes are more evolutionary in nature, in many instances are relaxations to existing requirements and, while providing an overall improvement in the Code, are not necessarily justified compared to the costs imposed on licensees to implement these changes. Moreover, when scope changes are made to the ASME Code, the staff must perform (currently and under Option 1) a backfit evaluation in accordance with 10 CFR 50.109 before it can incorporate those changes into 10 CFR 50.55a.

With respect to Option 1, the ACRS does not consider 10 CFR 50.109 to be well suited to assess the appropriateness of defense-in-depth requirements, which are intended to address uncertainties that are difficult to quantify. Until a systematic methodology is developed, the ACRS notes that decisions on defense-in-depth will have to be based on judgment. The ACRS concludes that the collective judgment of the broad-based group of experts represented by the ASME Code should be reflected in the inspection requirements. The staff considers 10 CFR 50.109 to be amenable to evaluations of the need to update the defense-in-depth requirements associated with ISI and IST programs. In particular, the NRC regulations in 10 CFR 50.109 states, in part, that the Commission will require backfitting only when it determines that "there is a substantial increase in the overall protection of the public health and safety ... and that the direct and indirect costs of implementation for that facility are justified in view of this increased protection." In addition, the Charter of the Committee to Review Generic Requirements (CRGR) notes in [Attachment 3](#) that the Commission has stated that the criterion in 10 CFR 50.109 regarding a substantial increase in the overall protection of the public health and safety is "flexible enough to allow for qualitative arguments that a given proposed rule would substantially increase safety." The CRGR Charter further states that "[i]ncorporation of industry standards (including revisions to existing codes and standards) into NRC rules or staff positions, as a prudent means of assuring continued conformance with currently voluntary standards and practices that provide substantial safety benefit, can provide the basis for a finding that a proposed backfit meets the 'substantial increase' standard of 10 CFR 50.109." The CRGR Charter lists the incorporation of advances in science and technology as one example of the factors that may be argued to contribute directly or indirectly to a substantial increase in safety.

The ACRS and the staff agree that the 1995 Edition with the 1996 Addenda of the ASME Code would provide a technically superior baseline for ISI and IST programs under Option 1 than the 1989 Edition of the ASME Code. As a result, the staff is recommending under Option 1.B the adoption of the 1995 Edition with the 1996 Addenda of the ASME Code as incorporated by reference in 10 CFR 50.55a as the initial baseline for ISI and IST programs. The staff believes that Option 1 will continue to rely on the judgment of the broad-based group of experts associated with the ASME Code in developing new and improved ISI and IST techniques. However, under Option 1, licensees would only be required to update their ISI and IST programs to future editions or addenda of the ASME Code when justified by the NRC as providing a safety significant enhancement to those programs and balanced against the increased burden that would be incurred by the licensees. The staff also believes that voluntary updates to more recent editions of the ASME Code will provide licensees the maximum flexibility in determining the most cost-effective approach for their facilities.

Finally, the staff points out that it will continue to review and endorse the latest editions of the ASME Code so that they can be used, on a voluntary basis, by all licensees. In the course of these reviews, the staff will assess whether the changes made to the ASME Code are of such significance as to warrant the staff backfitting the Code, either in part or in total, as a requirement. The staff concludes this approach will have two major benefits. First, it will require the staff to evaluate ASME Code improvements in accordance with the standards that are used to evaluate other potential improvements that the staff proposes to backfit on licensees, namely the 10 CFR 50.109 standard. As stated previously, the staff believes that this standard can be effectively applied through qualitative assessments. Second, the staff believes that this approach will provide an impetus for the ASME to more carefully consider those items it includes in new editions of the Code. For example, the ASME may decide to identify some items as voluntary but not mandatory or, for those items it includes as mandatory, it may evaluate them against the 10 CFR 50.109 standard.

Based on the above discussion of the ACRS comments, the staff has decided to retain its recommendation for implementation of Option 1.B in this Commission paper.

RESOURCES

In SECY-99-029, "NRC Participation in the Development and Use of Consensus Standards," the staff outlined a process to enhance in a more effective and efficient manner its participation in the development and use of consensus standards. The NRC currently expends resources of approximately 1 full-time equivalent (FTE) on an annual basis to review new ASME Code editions issued every 3 years and to prepare rulemaking to incorporate by reference those new ASME Code editions and their addenda into the NRC regulations. As part of that review, the staff determines whether specific ASME Code provisions meet 10 CFR 50.109 with respect to scope or accelerated implementation as a backfit requirement. If Option 1 is selected by the Commission, the staff will also review the new ASME Code editions and addenda to determine whether those improvements individually or cumulatively justify revision of the ISI/IST baseline requirements. Based on Option 1, the staff estimates that an additional one-time resource burden of FTE would be required for developing guidelines to evaluate changes to the ASME Code for determining the need to revise the ISI/IST baseline requirements. In addition, the staff estimates a recurring additional resource burden of FTE to evaluate ASME Code improvements against 10 CFR 50.109 to determine whether the baseline should be revised to reflect the latest Code edition and addenda. This would bring the total resource burden under Option 1 to about 1 FTE annually in order to endorse the most recent ASME Code editions and addenda (including reviewing new ASME Code editions and their addenda, preparing rulemaking to endorse the new ASME Code editions, and identifying the need to backfit specific ASME Code provisions) and updating the ISI/IST baseline as necessary. If Option 2 is selected, the resource burden would remain 1 FTE annually to continue the staff's current practice of incorporating by reference the most

recent ASME Code editions and addenda into the regulations. If Option 3 is selected, the staff estimates that an additional one-time resource burden of about FTE will be required to develop guidance for the successful application of plant-specific alternatives to the ISI/IST update requirement. The staff also estimates a recurring additional resource burden of FTE to evaluate individual licensee requests to not update their ISI and IST programs. Therefore, the total resource burden for Option 3 would be about 1 FTE annually to incorporate by reference the most recent ASME Code editions and addenda into the regulations, and to evaluate licensee requests not to update their ISI and IST programs. Resource requirements for each of these options are currently within the budget.

COORDINATION

The Office of the General Counsel has reviewed this Commission paper and has no legal objection to its content. The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections to its content. The Office of the Chief Information Officer has reviewed the Commission paper for information management and information technology implications and concurs in it. The Offices of Congressional Affairs and Public Affairs have no objection to this Commission paper.

RECOMMENDATION

That the Commission

1. Approve

The staff's recommendation based on consideration of the Commission's performance goals to proceed with rulemaking to implement Option 1.B as described in this paper. This rulemaking will replace the 120-month ISI/IST update requirement with a baseline consisting of the 1995 Edition with the 1996 Addenda of the ASME Code as currently incorporated into the regulations. This baseline recommendation is based principally on (1) the incorporation by reference of this ASME Code edition and addenda into the regulations on September 22, 1999, with the requirement that licensees update their ISI and IST programs at the next 120-month interval, and (2) the substantial improvements to the ASME Code since 1989 identified by staff review and public comments.

2. Note that

The staff is encouraging use of risk-informed ISI and IST programs and development of ASME Code cases to implement these alternatives. In addition, the staff has a major initiative underway to revise 10 CFR Part 50 to be more effective in a risk-informed environment. The project includes rulemaking activities to reduce special treatment requirements in safety-related components of low safety significance. The staff is encouraging the standard-writing consensus committees (such as ASME) to participate in these industry and regulatory issues. ASME representatives have expressed the desire to be a part of these efforts. Further, the staff is evaluating the specifics of the ISI/IST process for areas of improvement. As an outgrowth of the activities to make 10 CFR Part 50 risk informed, the staff may propose additional improvements for the review and implementation of ISI and IST programs.

The staff will await direction from the Commission prior to initiating action on this paper.

/RA/

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- Attachments:
- [1. History of Rulemaking for Inservice Inspection and Inservice Testing Requirements](#)
 - [2. Summary of Public Comments on the 120-Month Update Requirement for Inservice Inspection and Inservice Testing Programs](#)
 3. Replace the 120-month ISI/IST update requirement with a baseline of ISI and IST requirements and allow voluntary updating to entire subsequent NRC-endorsed ASME Code editions and addenda without prior NRC approval unless the baseline is revised in accordance with 10 CFR 50.109, where the init">Comparison of Options for Updating Inservice Inspection and Inservice Testing Programs Using Commission's Performance Goals

ATTACHMENT 1

HISTORY OF RULEMAKING FOR INSERVICE INSPECTION AND INSERVICE TESTING REQUIREMENTS

- [ASME Code in 10 CFR 50.55a](#)
- [Chronology of the Update Requirement](#)
- [Recent Rulemaking To Revise 10 CFR 50.55a](#)

ASME Code in 10 CFR 50.55a

The general design criteria in Appendix A to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR Part 50) require that structures, systems, and components of light-water reactors be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety function performed. The American Society of Mechanical Engineers (ASME) first issued a standard for the "Inservice Inspection (ISI) of Nuclear Reactor Coolant Systems" in 1968. In response to the rapid pace of nuclear power plant construction, ASME developed additional construction and ISI requirements. The provisions of the ASME Code have been utilized by the NRC since 1971 as one part of the framework to establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety. The mechanism for endorsement of the ASME standards has been to incorporate by reference the ASME rules into 10 CFR 50.55a. All segments of the industry are represented on ASME standards development committees (e.g., utility, manufacturing, insurance, and regulatory) developing improved methods for construction, ISI, and inservice testing (IST) of components in nuclear power plants.

Chronology of the Update Requirement

- 1971 The ISI requirements first adopted in 10 CFR 50.55a by the Commission in 1971 were based upon the construction permit date and did not refer to the operating license.
- 1972 The Commission modified its regulations to endorse specific editions and addenda of the ASME Code to comply with the notice and comment provisions of the Administrative Procedure Act, 5 U.S.C. §§ 552 and 553. In the Statement of Considerations for the 1972 rule, the Commission stated its intention to update 10 CFR 50.55a to incorporate new and amended editions of the ASME Code.
- 1974 Section 50.55a defines for the first time ISI requirements applicable during operation.
- 1977 An initial 20-month inspection period and subsequent 40-month ISI inspection periods are established. The need for licensees to revise ISI programs in subsequent 40-month inspection periods to comply with new ASME Code editions and addenda incorporated by reference into 10 CFR 50.55a is reiterated.
- 1979 The automatic update requirement for ISI programs is changed to the current 120-month interval. This change was adopted because it "makes the regulation more practical to implement and saves time and effort for both the NRC and the licensee without an increased risk to the public health and safety."
- 1989 During preparation of a proposed rule to endorse ASME Code, Section XI, Subsections IWE and IWL (containment examination) for the first time, a question was raised as to whether the backfit rule is applicable to the new subsections. A memorandum (dated March 15, 1989) from Stuart A. Treby, Assistant General Counsel for Rulemaking and Fuel Cycle, NRC Office of the General Counsel (OGC), to Eric S. Beckjord, Director of the NRC Office of Nuclear Regulatory Research (RES), on "Application of the Backfit Rule (10 CFR § 50.109) to Amendments to Codes and Standards Regulation (10 CFR § 50.55a)" documented the OGC position that the backfit rule applies to new subsections (PDR Accession #940518046).
- 1992 The Commission revised 10 CFR 50.55a to incorporate by reference the 1989 Edition of the ASME Code.
- 1993 Entergy Operations, Inc., submitted a request for relief from the requirement to update its ISI and IST programs to the latest ASME Code edition and addenda incorporated by reference into 10 CFR 50.55a. The underlying premise of the request was that a licensee should not be required to upgrade its ISI and IST programs without considering whether the costs of the upgrade are warranted in light of the increased safety afforded by the updated ASME Code edition and addenda. Entergy later updated its ISI and IST programs to the 1992 Edition.
- 1996 The National Technology Transfer and Advancement Act of 1995, Public Law 104-113, was signed into law on March 7, 1996.
- 1997 The OGC position regarding endorsement of the ASME Code and the applicability of the backfit rule was reaffirmed in a memorandum (dated March 18, 1997) from Karen D. Cyr, General Counsel, OGC, to David L. Morrison, Director of RES, on "Applicability of Backfit Rule to 10 CFR 50.55a" (PDR Accession #9802120205).
- 1997 Under the Commission's Strategic Assessment and Rebaselining Initiative, Direction-Setting Issue (DSI) 13, "Role of Industry," the NRC staff began addressing the evaluation of industry initiatives and reviewing several issues related to NRC endorsement of industry codes and standards. As part of this effort, the staff has been reviewing the NRC's endorsement of the ASME Code (including periodic updating), the impact of 10 CFR 50.109 (the backfit rule), and the process for NRC review and endorsement of the ASME Code.

Recent Rulemaking To Revise 10 CFR 50.55a

On December 3, 1997, the NRC published a proposed rule in the *Federal Register* (62 FR 63892) to update the requirements

in 10 CFR 50.55a for construction, ISI, and IST of nuclear power plant components. For construction, the NRC staff proposed to revise 10 CFR 50.55a to incorporate by reference Section III, Division 1, of the ASME *Boiler and Pressure Vessel Code* (ASME BPV Code), 1989 Addenda through the 1996 Addenda, for Class 1, Class 2, and Class 3 components, with certain limitations and modifications. For ISI, the staff proposed to revise 10 CFR 50.55a to incorporate by reference Section XI, Division 1, of the ASME BPV Code, 1989 Addenda up to and including the 1996 Addenda for Class 1, Class 2, and Class 3 components, with certain limitations. The proposed amendment included expedited implementation of Appendix VIII, "Performance Demonstration of Ultrasonic Examination Systems," to Section XI, Division 1, with certain modifications. The amendment also included expedited implementation of a proposed modification to ASME BPV Code, Section XI, addressing volumetric examination of Class 1 piping of the high pressure safety injection (HPSI) system in pressurized-water reactors. For IST, the staff proposed to revise 10 CFR 50.55a to incorporate by reference the 1995 Edition with the 1996 Addenda of the ASME *Code for Operation and Maintenance of Nuclear Power Plants* (ASME OM Code) for Class 1, Class 2, and Class 3 pumps and valves, with a limitation and modification. The staff proposed to permit the use of specific portions of the ASME Code and certain ASME Code cases. The proposed amendment maintained the requirement for licensees to update their ISI and IST programs every 120 months to the edition and addenda of the ASME BPV Code and the ASME OM Code incorporated by reference in 10 CFR 50.55a and in effect 12 months before the start of the new 120-month interval. The NRC received more than 500 comments on the proposed rule and revised the rule in response to those comments.

In the *Federal Register* notice dated December 3, 1997, the staff discussed NRC endorsement of the ASME Code. As noted in that *Federal Register* notice, the NRC's position has been that 10 CFR 50.109 does not require a backfit analysis for the routine 120-month ISI/IST program update. The basis for the NRC's position is that "(1) Section III, Division 1, update applies only to new construction (i.e., the edition and addenda to be used in the construction of a plant are selected based upon the date of the construction permit and are not changed thereafter, except voluntarily by the licensee), (2) licensees understand that §50.55a requires that they update their inservice inspection program every 10 years to the latest edition and addenda of Section XI that were incorporated by reference in §50.55a and in effect 12 months before the start of the next inspection interval, and (3) endorsing and updating references to the ASME Code, a national consensus standard developed by the participants (including the NRC) with broad and varied interests, is consistent with both the intent and spirit of the backfit rule (i.e., NRC provides for the protection of the public health and safety, and does not unilaterally impose undue burden on applicants or licensees)." The NRC has also noted that "to ensure that any interested member of the public that may not have had an opportunity to participate in the national consensus standard process is able to communicate with the NRC, proposed rules are published in the *Federal Register*" (62 FR 63905-06, December 3, 1997). Although this position on the backfit justification for the 120-month ISI/IST update requirement remains valid, the staff indicated in the *Federal Register* notice for the proposed rule that the requirement for updating ISI and IST programs every 120 months was being reviewed. For example, the staff suggested for some time that the ASME perform a cost-benefit evaluation of updated ASME Code editions and addenda with new provisions identified as mandatory or voluntary.

In SECY-99-017 (January 13, 1999), the staff provided to the Commission a revised schedule and approach for completing the amendment to 10 CFR 50.55a that would consider the need for the 120-month ISI/IST update requirement. In that Commission paper, the staff described a proposal to replace the ISI/IST update requirement with a voluntary provision for updating ISI and IST programs with establishment of a baseline for ISI and IST requirements. The staff then requested the Commission's approval of the revised schedule and approach. In a staff requirements memorandum (SRM) dated March 26, 1999, the Commission notified the staff that it did not object to the revised schedule and approach but directed that, before issuance of the final rule, the staff provide alternative implementation options, the bases for the recommendations, and a discussion of the pros and cons, including the impacts of the proposed changes to the regulations.

In a letter dated April 19, 1999, the Advisory Committee on Reactor Safeguards (ACRS) recommended that the 120-month ISI/IST update requirement be maintained. The ACRS did not believe that the current ASME Code requirements had reached a level of maturity that would result in little benefit from further updating. The ACRS did not consider the cost burden of updating the ISI and IST programs every 120 months to be excessive. The ACRS concurred with the NRC staff's position that if a baseline ASME Code is established, licensees voluntarily committing to an ASME Code edition or addenda subsequent to the baseline must implement all provisions of the edition or addenda.

On April 27, 1999 (64 FR 22580), the NRC published a supplement to the proposed rule (dated December 3, 1997) that would replace the requirement for nuclear power plant licensees to update their ISI and IST programs every 120 months with a provision for updating ISI and IST programs voluntarily. The proposed rule supplement would have established the baseline for ISI requirements for (1) components (including supports) classified as ASME Code Class 1, Class 2, and Class 3 as the 1989 Edition of the ASME BPV Code, Section XI, and (2) metal and concrete containment (Class MC and Class CC) components and their integral attachments as the 1992 Edition with the 1992 Addenda of Subsections IWE and IWL of Section XI of the ASME BPV Code. The proposed rule would have established the baseline for IST requirements for pumps and valves classified as ASME Code Class 1, Class 2, and Class 3 as the 1989 Edition of the ASME BPV Code, Section XI. The proposed rule also included the provisions for performance demonstration of ultrasonic examination systems in Appendix VIII of Section XI of the ASME BPV Code in the baseline requirements. The proposed rule would have allowed 5 years for licensees to implement the baseline or a later ASME Code edition or addenda. The proposed rule indicated that licensees could voluntarily apply the full requirements of subsequent editions or addenda of the ASME Code incorporated by reference in the regulations, subject to the specified limitations and modifications, without requesting specific NRC approval. However, licensees would need to obtain prior NRC approval to apply only a portion of an ASME Code edition or addenda that was not preapproved. The staff would continue to review future ASME Code editions and addenda for incorporation by reference in the regulations for voluntary use by licensees and to determine whether any specific provisions of those future ASME Code editions and addenda satisfy 10 CFR 50.109 for implementation as backfit requirements.

On May 27, 1999, the staff held a public workshop at NRC headquarters in Rockville, Maryland, to discuss the requirement for

licensees to update their ISI and IST programs every 120 months. Approximately 60 participants attended the workshop including members of the NRC staff, several private citizens, and individuals from ASME, the Illinois Department of Nuclear Safety, the Nuclear Energy Institute, and certain nuclear utilities. The workshop discussions revealed a wide range of views on the 120-month ISI/IST update requirement. A transcript of the public workshop discussions was prepared. The staff requested the participants to submit their comments on the proposed rule in writing to ensure consideration of their comments.

In an SRM dated June 24, 1999, the Commission directed the staff to defer consideration of the 120-month ISI/IST update requirement and to complete the final rulemaking revising 10 CFR 50.55a to incorporate by reference the 1995 Edition with the 1996 Addenda of the ASME BPV Code and the ASME OM Code. The rulemaking was also to be subject to the specific limitations or modifications determined following the consideration of public comments on the proposed rule issued on December 3, 1997. The Commission directed the staff to mandate the expedited use of Appendix VIII on qualification of ultrasonic examination systems in the ASME BPV Code, Section XI, as well as to require the use of the 1995 Edition with the 1996 Addenda of the ASME Code in updating ISI and IST programs for those licensees approaching their next 120-month ISI and IST program interval. The Commission specified that the rulemaking package be completed expeditiously and not be further delayed to include consideration of the elimination of the 120-month ISI and IST update requirement.

During review of the ISI/IST update requirement, the Commission directed that the staff evaluate public comments received on the proposed rule supplement and discuss this issue further with the ACRS. The Commission also stated that the staff should evaluate the implications of introducing backfit considerations to 10 CFR 50.55a relative to ISI and IST program requirements if the 120-month update requirement is eliminated. The Commission requested that the staff provide the results of its efforts, along with options and recommendations regarding the efficacy and desirability of eliminating the 120-month update provision.

On September 22, 1999, the NRC published in the *Federal Register* (64 FR 51370) the final rule to incorporate by reference the 1995 Edition with the 1996 Addenda of the ASME BPV Code and the ASME OM Code into 10 CFR 50.55a with specific limitations and modifications. In accordance with 10 CFR 50.109, the rule includes a requirement for licensees to expedite the implementation of the provisions of Appendix VIII of the ASME BPV Code, Section XI, for performance demonstration of ultrasonic examination systems. The rule allows the optional implementation of the provisions of the ASME BPV Code, Section XI, for surface examinations of HPSI Class 1 piping welds while the staff evaluates the need for interim action during the development of an industry initiative on thermal fatigue in nuclear power plant piping. The rule permits the use of specific portions of the ASME Code and certain ASME Code cases.

ATTACHMENT 2

SUMMARY OF PUBLIC COMMENTS ON THE 120-MONTH UPDATE REQUIREMENT FOR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAMS

- [Potential Effect of the Proposal on Safety, including Potential Reductions in Effectiveness of ASME Codes](#)
- [Selection of Proper Baseline Edition and Addenda of ASME Codes](#)
- [Regulatory Benefits \(or Hardships\) for Licensees, Industry Suppliers \(Including Vendors\), Nuclear Insurers, States, Standards Organizations, and Others as a Result of the Proposal](#)
- [Reduction in Burden on Licensees by Eliminating the Requirement To Update ISI and IST Programs and Related Procedures](#)
- [Potential Effect of the Proposal on the Reduction in the Number of Licensee Submittals \(e.g., Relief Requests\)](#)
- [Consistency in the Range of ASME Code Editions and Addenda Applied by Licensees](#)
- [Potential Effect of the Proposal on Risk-Informed ISI and IST Initiatives](#)
- [Potential Effect of the Proposal on States and Other Organizations](#)
- [Application of Portions of ASME Codes Incorporated by Reference in Regulations](#)
- [Miscellaneous Comments](#)

In the *Federal Register* notice dated April 27, 1999, the NRC staff requested comments on a proposal to replace the requirement in the NRC regulations for licensees to update their inservice inspection (ISI) and inservice testing (IST) programs every 120 months with a voluntary provision for updating those ISI and IST programs. The staff received more than 40 letters, facsimiles, or electronic submittals from various sources, including the American Society of Mechanical Engineers (ASME), the Nuclear Energy Institute (NEI), many nuclear utilities, the Illinois Department of Nuclear Safety (IDNS), several individuals associated with the ASME Code or ISI and IST programs, and a legal firm. The staff herein summarizes the public comments on the 120-month ISI/IST update requirement, including those comments from a public workshop conducted on May 27, 1999.

Potential Effect of the Proposal on Safety, including Potential Reductions in Effectiveness of ASME Codes

The comments received on the proposed rule provided differing views regarding the potential for a direct effect on safety from the proposed replacement of the 120-month ISI/IST update requirement with a provision for voluntary updating of ISI and IST programs. Some commenters (e.g., NEI, nuclear utilities, and the legal firm) did not believe that periodic revisions to the ASME Code resulted in safety-significant improvements in ISI and IST requirements. One commenter (ASME) stated that operating experience, research results, and new technology are applied in adjusting and refining the ASME Code and that this process has worked well for many years. Some commenters (e.g., ASME, IDNS, and several individuals) pointed to recent

additions to the ASME Code (such as comprehensive pump test requirements, or resistance and laser beam welding techniques) and the positive effect of small cumulative ASME Code changes as evidence of improvements in ISI and IST methods in successive editions of the ASME Code. These latter commenters also noted the opportunity to identify and correct potential weaknesses in the ISI and IST programs during the updating process.

The commenters disagreed on the effect of replacement of the 120-month ISI/IST update requirement with a voluntary updating provision on the participation of licensees on ASME Code committees. Some commenters (e.g., ASME, some individuals, and one utility) predicted potentially significant reductions in licensee participation and possible adverse effects on the evolution of the ASME Code. These commenters also were concerned about potential unforeseen impacts on the historically successful ASME Code process. Other commenters (e.g., NEI, one individual, and one utility) believed that licensee participation would continue in order to share operating experience, discuss industry issues, and pursue specific efforts.

Selection of Proper Baseline Edition and Addenda of ASME Codes

Some commenters (e.g., NEI and several utilities) believed that the 1989 Edition of the ASME Code provided an appropriate level of safety with more recent ASME Code editions and addenda available for voluntary use. Other commenters (e.g., ASME, IDNS, and several individuals) considered the establishment of any baseline to be inappropriate and pointed to the value of the evolutionary process and specific improvements made to the ASME Code since 1989. For example, these commenters noted that the ASME Code has been revised to include new welding techniques; more comprehensive pump tests; expanded provisions for repair, replacement, and modifications; relaxation of provisions to allow reductions in radiation exposure; changes to enhance implementation of some ASME Code provisions; methods for evaluating flaws in thin-wall ferritic piping; and issuance of the ASME *Code for Operation and Maintenance of Nuclear Power Plants* (ASME OM Code) for IST of pumps and valves to replace previous standards. Some commenters (e.g., two utilities) recommended selection of the 1998 Edition of the ASME Code as the baseline to incorporate the most recent improvements in ISI and IST methods. With respect to ISI requirements for metal and concrete containment, some commenters (e.g., NEI and several utilities) recommended that the baseline be established as either the 1992 or 1998 Edition of Subsections IWE and IWL of the ASME *Boiler and Pressure Vessel Code* (ASME BPV Code), Section XI. Several commenters (e.g., NEI, the legal firm, and some utilities) asserted that the NRC staff had not justified the backfit implementation of Appendix VIII of the ASME BPV Code, Section XI, on performance demonstration of ultrasonic examination systems. One commenter (IDNS) believed that the multiple ASME Code editions and addenda in the baseline requirements presented in the proposed rule for various plant components might cause confusion, based on observations by State inspectors. Another commenter (ASME) also noted possible confusion resulting from the inclusion of multiple ASME Code editions in the baseline. Another commenter (an individual) recommended that the baseline for IST requirements be more recent than 1989 in order to incorporate the ASME OM Code. Some commenters (e.g., NEI and one utility) stated that application of a baseline other than the baseline discussed in the proposed rule would prevent the submittal of public comments on that new baseline.

Regulatory Benefits (or Hardships) for Licensees, Industry Suppliers (Including Vendors), Nuclear Insurers, States, Standards Organizations, and Others as a Result of the Proposal

Some commenters (e.g., NEI) believed that the establishment of a baseline for ISI and IST requirements would increase regulatory stability and lead to higher quality inspections and more efficient use of resources, including a reduced number of relief request submittals. Other commenters (e.g., ASME and some individuals) considered the regulatory benefits from replacement of the ISI/IST update requirement with a voluntary updating provision to be minimal in terms of cost per year and that this action might result in the need for licensees to submit additional relief requests. One commenter (ASME) pointed to ASME Code cases prepared over the last few years as reflecting the economic benefit and reductions in radiation exposure resulting from improvements to the ASME Code. One commenter (a utility) believed that elimination of the ISI/IST update requirement would allow the NRC staff to review and endorse updated editions and addenda of the ASME Code in a more timely manner. Another commenter (ASME) predicted that a reduced emphasis on the ASME Code process by the NRC staff would delay endorsement of subsequent ASME Code editions and addenda. One commenter (an individual) predicted hardship to vendors that supply nondestructive examination services in that special procedures will need to be maintained for nuclear and non-nuclear plants if different requirements exist between those plants. This commenter also suggested that nuclear insurers will have to be more versed in various exceptions to ASME Code provisions in reviewing ISI and IST programs if the update requirement is eliminated.

Reduction in Burden on Licensees by Eliminating the Requirement To Update ISI and IST Programs and Related Procedures

Some commenters (e.g., NEI, several utilities, and one individual) reported that the reduction in burden on licensees by the elimination of mandatory updating of ISI and IST programs would be much greater than the amount to be saved (\$200,000 to \$300,000) predicted in the proposed rule. For example, NEI estimated that a typical plant spends from \$500,000 to \$1,500,000 every 10 years to update its ISI and IST programs. Other commenters (e.g., ASME and one individual) believed that the extent of savings might not be as great as expected because (1) the updating costs are not as high as suggested by some commenters, (2) licensees might expend resources to voluntarily update their ISI and IST programs, or (3) licensees might need to submit additional relief requests if the ISI/IST update requirement is eliminated. Further, some commenters (e.g., ASME and one individual) suggested that eliminating the ISI/IST update requirement could result in increased burden in that updating can minimize licensee submittals, work requirements, and worker radiation exposure.

Potential Effect of the Proposal on the Reduction in the Number of Licensee Submittals

(e.g., Relief Requests)

Some commenters (e.g., NEI and one utility) believed that licensees would need to submit fewer relief requests if the 120-month ISI/IST update requirement is eliminated because they would not be required to renew relief requests with each ISI and IST program update. Other commenters (e.g., ASME, one utility, and one individual) believed that licensees would continue to submit relief requests to a similar or greater extent, if the update requirement is eliminated, to obtain approval for use of portions of recent editions and addenda of the ASME Code and for use of ASME Code cases. One commenter (a utility) pointed to potential scheduling difficulties for NRC review of randomly submitted relief requests.

Consistency in the Range of ASME Code Editions and Addenda Applied by Licensees

Some commenters (e.g., NEI and some utilities) asserted that the establishment of a baseline for ISI and IST requirements would promote (or not affect) consistency in the range of ASME Code editions and addenda being applied by licensees. Other commenters (e.g., ASME and one utility) believed that updating of ISI and IST programs provides standardization and consistency and that elimination of the update requirement would increase the range of applied ASME Code editions and addenda, or ASME Code cases, as licensees diverge from the baseline requirements. One commenter (ASME) suggested that inconsistency might occur as a result of plant-specific review of licensee requests to apply various ASME Code editions if the update requirement is eliminated.

Potential Effect of the Proposal on Risk-Informed ISI and IST Initiatives

Some commenters (e.g., NEI and one utility) asserted that replacement of the 120-month ISI/IST update requirement with a voluntary updating provision would not have any impact on risk-informed ISI and IST initiatives. One commenter (ASME) noted that Section XI of the ASME Code is in the midst of a change in philosophy and scope by moving from prescribed repetitive inspections to risk-informed programs. This commenter considered the ASME Code to be a "living document" that could be adversely affected in many respects by elimination of the update requirement. For example, some commenters (e.g., ASME and one utility) suggested that the effort underway within the ASME Code to incorporate risk-informed concepts might be adversely affected by a possible reduction in participation in ASME Code activities.

Potential Effect of the Proposal on States and Other Organizations

The IDNS commented that its rules are currently synchronized with the ASME Code editions and addenda accepted by the NRC for ISI and IST requirements. However, the IDNS noted that a concern could arise if the 120-month ISI/IST update requirement is replaced with a voluntary provision and the State of Illinois decided to update its rules to the latest edition of the ASME Code for these requirements. Another commenter (ASME) also asserted that the proposed rule would create inconsistency between Federal and State requirements. One commenter (an individual) asserted that States, vendors, nuclear insurers, and standard development organizations would be adversely affected by the proposed action through the perception of reduced emphasis on safety and the increase in the differences in ISI and IST programs. Other commenters (e.g., two utilities) did not believe that these organizations would experience a significant impact as a result of the proposed action. One commenter (an individual) believed that insurance companies or inspection agencies might be adversely affected by the reduction in research to improve inspection techniques.

Application of Portions of ASME Codes Incorporated by Reference in Regulations

Some commenters (e.g., NEI and one individual) recommended that licensees be allowed to use portions of editions and addenda of the ASME Code incorporated by reference into the regulations. One commenter (an individual) suggested that the requirement for NRC approval before use of a portion of an ASME Code edition or addenda could preclude incentives for the ASME Code committees to prepare ASME Code sections that identify those portions of the ASME Code that can be implemented without conflict with the remaining ASME Code section. This commenter also recommended that licensees be allowed to justify use of a portion of an ASME Code edition or addenda through the 10 CFR 50.59 process. One suggestion was that the NRC prepare generic evaluations of relief requests to allow use of portions of ASME Code editions and addenda by all licensees. One commenter (an individual) requested that Subsections IWA-4000 and IWA-7000 of the ASME BPV Code, Section XI, on repair, replacement, and modification be endorsed for use independent of other portions of the ASME Code. Some commenters (e.g., two utilities) suggested that the provision in the proposed rule for use of portions of more recent ASME Code editions and addenda be clarified with respect to the requirements of Subsection IWA of the ASME BPV Code, Section XI.

Miscellaneous Comments

Several commenters (e.g., ASME, NEI, several utilities, certain individuals, and the legal firm) emphasized the importance of more prompt NRC staff review and endorsement of revised editions and addenda of the ASME Code and of ASME Code cases. Suggestions were offered to improve the NRC's review and endorsement process, including allowing licensees to adopt ASME Code editions and addenda and ASME Code cases 6 months after being published unless the NRC directs otherwise. One commenter (ASME) believed that elimination of the 120-month ISI/IST update requirement would be inconsistent with the National Technology Transfer and Advancement Act of 1995, Public Law 104-113. Another commenter (a utility) requested that the NRC address the burden associated with qualification of quality assurance inspectors to meet different standards. One commenter (NEI) objected to the possibility that the NRC staff might place time limits on relief requests because of the potential for increased burden resulting from resubmittal of those requests. One commenter (a utility) stated that the

proposed rule should clarify the implementation of ASME Code provisions referenced in Subsections IWE and IWL and Appendix VIII of the ASME BPV Code, Section XI, that are more recent than the proposed baseline ASME Code edition and addenda. Another commenter (a utility) requested that the list of approved ASME Code cases and portions of the ASME Code editions and addenda be maintained to ensure that licensees do not unknowingly apply an unapproved document. Some commenters (e.g., three utilities) requested clarification of the overall implementation of the proposed rule.

COMPARISON OF OPTIONS FOR UPDATING INSERVICE INSPECTION AND INSERVICE TESTING PROGRAMS USING COMMISSION'S PERFORMANCE GOALS

- [Maintaining Safety](#)
- [Increasing Public Confidence](#)
- [Reducing Unnecessary Regulatory Burden](#)
- [Making NRC Activities and Decisions More Effective, Efficient, and Realistic](#)

In this Commission paper, the NRC staff has identified three options regarding the requirement that licensees update their inservice inspection (ISI) and inservice testing (IST) programs every 120 months. These options are as follows:

- (1) Replace the 120-month ISI/IST update requirement with a baseline of ISI and IST requirements and allow voluntary updating to entire subsequent NRC-endorsed ASME Code editions and addenda without prior NRC approval unless the baseline is revised in accordance with 10 CFR 50.109, where the initial baseline will consist of one of the following three possible sets of ISI and IST requirements:
 - (A) The 1989 Edition of the ASME *Boiler and Pressure Vessel Code* (ASME BPV Code) for ISI of ASME Code Class 1, 2, and 3 components (including supports) and for IST of ASME Code Class 1, 2, and 3 pumps and valves; the 1992 Edition with the 1992 Addenda of Subsections IWE and IWL of the ASME BPV Code for ISI of Class MC and Class CC components and their integral attachments; the 1995 Edition with the 1996 Addenda of Appendix VIII of the ASME BPV Code, Section XI, with limitations and modifications specified in 10 CFR 50.55a (as discussed in the proposed rule dated April 27, 1999);
 - (B) The 1995 Edition with the 1996 Addenda of the ASME Code with the limitations and modifications specified in the NRC regulations, or
 - (C) A later version (e.g., the 1998 Edition) of the ASME Code with appropriate limitations and modifications.
- (2) Retain the current 120-month ISI/IST update requirement and the current regulatory provision that allows licensees to use portions of NRC-endorsed ASME Code editions or addenda provided that all related requirements of the respective editions are met.
- (3) Retain the 120-month ISI/IST update requirement and the current provision for use of portions of NRC-endorsed ASME Code editions or addenda, but develop explicit guidance for plant-specific alternatives to the ISI/IST update requirement.

Option 1 would replace the 120-month ISI/IST update requirement with a provision that allows voluntary updating if the selected baseline for ISI and IST requirements is not revised. The initial ISI and IST baseline requirements under Options 1.A, 1.B, and 1.C would focus principally on the 1989, 1995, or 1998 Edition of the ASME Code, respectively, with appropriate limitations and modifications. All licensees would be required to update their programs to the selected baseline edition and addenda of the ASME Code. There are two alternatives with respect to the timing of licensee updating: (1) to require all licensees to update by a date certain or within a specific period of time (i.e., 1 year after issuance of the rule); or (2) updating when their current 120-month ISI/IST programs are completed. At this time, the staff intends to specify that licensees update their ISI and IST programs to the initial baseline when their current 120-month ISI/IST programs are completed. Staff resources could be managed most efficiently by the submittal of relief requests associated with updating if a new baseline is established as licensees reach their 120-month review cycle. Licensees would be allowed to voluntarily update their ISI and IST programs to entire editions and addenda of the ASME Code which are approved for use (endorsed) and incorporated by reference into 10 CFR 50.55a. Prior staff review and approval would not be necessary for licensees to voluntarily adopt ASME Code editions and addenda that are endorsed for voluntary use which are more recent than their licensing basis. Staff approval would be required if licensees were to slip back and choose to use an ASME Code edition or addenda which is older than their licensing basis at the time of the change. Licensees could request approval for use of a *portion* of an endorsed ASME Code edition or addenda pursuant to the provisions in 10 CFR 50.55a(a)(3) governing staff approval of alternatives. Finally, licensees could request approval under 10 CFR 50.55a(a)(3) for the use of all or portions of an ASME Code edition or addenda which have not been approved for use and incorporated by reference into 10 CFR 50.55a. The emphasis toward the use of entire editions or addenda of the ASME Code would ensure that interrelated requirements of the edition or addenda are applied without reducing the effectiveness of the ASME Code requirements.

After establishment of the initial ISI/IST baseline through rulemaking under Option 1, the NRC staff would continue to review

subsequent ASME Code editions and addenda for either imposition as a mandatory requirement, or endorsement as a voluntary alternative which could be used by licensees without prior NRC review and approval (so long as the edition or addenda being selected is more recent than their licensing basis at the time of the change). Both mandatory imposition or endorsement for voluntary use would ordinarily be accomplished through rulemaking. The staff would also evaluate whether specific ASME Code provisions (or groups of related provisions) should be mandated or endorsed for voluntary use based upon 10 CFR 50.109. The staff would also evaluate whether new ASME Code editions and addenda, when considered in the aggregate, should be adopted as a new baseline requirement based upon the 10 CFR 50.109 evaluation factors to be used for endorsing individual ASME Code provisions. The staff would ensure that assumptions for aging mechanisms as part of the review of licensee requests for extension of operating licenses remain valid.

Under Option 2, the NRC would retain the current 120-month ISI/IST update requirement to update ISI and IST programs every 120 months to incorporate the latest improvements in ISI and IST methods provided in the ASME Code. This option would also retain the current regulatory provisions in 10 CFR 50.55a that allow licensees to use portions of ASME Code editions or addenda incorporated by reference in the regulations provided that all related requirements of the respective editions are met. Option 2 requires licensees to periodically review their ISI and IST programs. The NRC staff has found that the process of updating ISI and IST programs every 120 months identifies deficiencies in those programs. For example, the staff reviewed licensee event reports (LERs) issued in the 1990s related to deficiencies in ISI and IST programs to determine those deficiencies detected during the 120-month program updates. Of the 122 LERs considered applicable to this question, nearly 25 percent (30 out of 122) of the LERs indicated that the ISI and IST program deficiencies were found during the 120-month program updates. The reasons for the identification of program deficiencies during the updating process vary. However, a primary reason appears to be the periodic modification of plant procedures related to examination, testing, repair or replacement, and maintenance of safety-related components with those modified procedures not undergoing detailed review for consistency with ISI and IST program requirements. Therefore, the 120-month ISI and IST program updates promote safety by ensuring that safety-significant components continued to be examined, tested, and repaired or replaced in accordance with 10 CFR 50.55a.

Option 2 helps ensure that safety is maintained at nuclear power plants by incorporating operating experience and new examination and repair techniques into the programs as a result of the evolving ASME Code. This option also could be viewed as cost neutral in that, for some licensees, the 120-month ISI/IST update requirement might be as cost effective as modifying the update requirement because the costs associated with obtaining NRC approval for use of portions of future ASME Code editions or addenda, and ASME Code cases, might be similar to the cost of updating the ISI and IST programs every 120 months.

Option 3 would retain the 120-month ISI/IST update regulatory requirement and the current provision for use of portions of NRC-endorsed ASME Code editions or addenda. This option is similar to Option 2 except that the staff would develop explicit guidance for the successful application of plant-specific alternatives to the ISI/IST update requirement pursuant to existing regulations in 10 CFR 50.55a(a)(3). The guidance would consider such aspects as the remaining operating life of the facility and the safety significance of evolutionary changes to the ASME Code. Under Option 3, the licensee would be required to demonstrate that its current ISI and IST programs provide an acceptable level of safety in lieu of updating those programs to a more recent edition of the ASME Code incorporated by reference in the regulations. This option would be similar to the approach taken on October 21, 1993, by Entergy Operations, Inc., in requesting relief from the requirement to update its ISI and IST programs, except that more definitive guidance would be available for licensees to successfully pursue this approach.

Option 3 would use an existing regulatory process for licensees to avoid the burden of updating their ISI and IST programs every 120 months. For example, nuclear plants that have a small number of years (such as 15 or less) of remaining life would not need to update their ISI and IST programs when the licensee satisfactorily demonstrates that the proposed alternative would provide an acceptable level of quality and safety. This option would be responsive to those commenters who were concerned that elimination of the ISI/IST update requirement would discourage participation of licensees on ASME Code committees and potentially cause the technical quality of the ASME Code to be adversely affected. The staff would need to review individual licensee requests for alternatives to the 120-month ISI/IST update requirement. The staff would need to develop a process to ensure consistency in the acceptance of alternatives to the 120-month ISI/IST update requirement. Some licensees might decide to continue updating their ISI and IST programs every 120 months as currently required.

In the following discussion, the staff compares these options through application of the Commission's performance goals of (1) maintaining safety, (2) increasing public confidence, (3) reducing unnecessary regulatory burden, and (4) making NRC activities and decisions more effective, efficient, and realistic.

Maintaining Safety

Each option includes provisions for updating ISI and IST programs, although the criteria to require updating differ between the options. For example, Option 1 would apply a threshold in accordance with 10 CFR 50.109 to determine if updating of ISI and IST programs is appropriate as new ASME Code editions and addenda are issued. Under Option 1, significant safety improvements in the ASME Code would be imposed according to 10 CFR 50.109 either by revision of the ISI/IST baseline requirements or identification of a specific ASME Code provision to be backfit. Option 2 would maintain the current approach that ISI and IST programs are updated at 120-month intervals. Option 3 would require that licensees demonstrate that their ISI and IST programs provide an acceptable level of quality and safety without the need to update those programs to a more recent ASME Code edition. The staff finds that the safety of nuclear power plants will be maintained by the provision for updating of ISI and IST programs as described under each option.

With respect to an initial baseline to be selected under Option 1, the staff noted in the *Federal Register* notice forwarding the

proposed rule for public comment that the appropriate baseline was under consideration and requested comments in this regard. As a result, the staff obtained significant public comments on the appropriate baseline for ISI and IST requirements. Some commenters believed that the 1989 Edition of the ASME Code (Option 1.A) provides adequate baseline requirements for ISI and IST programs, with most plants currently implementing this ASME Code edition. Other commenters pointed to improvements to the ASME Code since 1989, and suggested that more recent ASME Code editions such as the 1995 Edition with the 1996 Addenda (Option 1.B) or the 1998 Edition (Option 1.C) should be selected as the ISI/IST baseline or recommended continuation of the current requirement for updating ISI and IST programs every 120 months (Option 2). The changes in the ASME Code since 1989 have not been explicitly quantified in terms of improvement in plant safety and, as a result, the staff would need to review those changes to finalize the baseline under Option 1.A. The selection of the 1995 Edition with the 1996 Addenda of the ASME Code, with the specified limitations and modifications, as the baseline for ISI and IST programs under Option 1.B would apply recent substantial ISI and IST improvements that have been incorporated by reference in 10 CFR 50.55a with a requirement that licensees approaching their next 120-month interval update their ISI and IST programs to this ASME Code edition and addenda. The selection of the 1998 or later ASME Code edition with appropriate limitations and modifications as the baseline for ISI and IST programs under Option 1.C would apply the most recent improvements in ISI and IST methods, including Subsections IWE and IWL of the ASME BPV Code, Section XI, for metal and concrete containments. The 1998 edition of Subsections IWE and IWL address issues in the 1995 edition such that many relief requests could be avoided; however, if cost beneficial, licensees could update to the 1998 edition voluntarily once it is endorsed.

Regardless of the option selected, the NRC staff will continue to review future ASME Code editions and addenda for incorporation by reference into the regulations, implementation of specific ASME Code provisions as backfit requirements and, under Option 1, revision of the ISI/IST baseline requirements. Therefore, the staff does not view the importance of the ASME Code to be diminished by implementation of any of the three options. However, some commenters believed that modification of the 120-month ISI/IST update requirement will reduce participation on ASME Code committees. The staff believes that licensees will continue to support the ASME Code, because revised editions often provide more practical requirements than previous Code requirements and licensees could voluntarily adopt these improvements without further NRC review and approval following NRC endorsement for voluntary use through rulemaking revising 10 CFR 50.55a. In addition to the ASME Code, the ASME consensus process also develops ASME Code cases that present acceptable alternatives to specific ASME Code provisions, and their development should continue because of their particular usefulness to licensees in implementing ISI and IST programs. If participation on the ASME Code committees did change from the selection of Option 1, it does not mean that plant safety would be adversely affected.

The licensee's process of updating ISI and IST programs provides a means of assessing the adequacy of those programs to help maintain plant safety. Weaknesses in ISI and IST programs have been identified through the 120-month updating process. Nevertheless, licensees should not rely on a review once every 10 years to identify weaknesses in their ISI and IST programs. The staff expects licensees to maintain the adequacy of their ISI and IST programs through plant activities, such as the quality assurance program, on a continuing basis. When a new baseline is established, the update review would require licensees to identify and correct potential weaknesses in their ISI and IST programs. The staff plans to note the importance of licensees ensuring that inspections and tests specified by the ASME Code are performed in accordance with their established schedule as part of the final rulemaking on the ISI/IST update requirement.

Increasing Public Confidence

Option 1 could increase public confidence by applying ISI/IST update requirements more consistent with other new requirements imposed on operating nuclear power plants. Option 1.A could have a negative perception in terms of public confidence because of the age of the ASME Code edition. Option 2 could increase public confidence by maintaining the current 120-month ISI/IST update requirement that applies the latest technological improvements to ISI and IST programs, but could have a negative perception of regulatory inflexibility and that the staff is unable to justify new requirements in accordance with its own rule (10 CFR 50.109). Option 3 could increase public confidence by retaining the 120-month update regulatory requirement but might have an adverse effect on public confidence if it was perceived that the staff might authorize licensees to avoid updating their ISI and IST programs as an alternative to the regulations without the benefit of public participation.

The National Technology Transfer and Advancement Act of 1995 (Pub. L. 104-113) requires all Federal agencies and departments to use technical standards that are developed or adopted by voluntary consensus standards bodies, and to use these technical standards as a means to carry out policy objectives or activities determined by the agencies or departments, unless use of such standards is inconsistent with law or otherwise impractical. Regardless of the option selected, the staff will continue to review future ASME Code editions and addenda for endorsement and possible mandatory application. Therefore, the staff considers each option to be compatible with Public Law 104-113 and implementing guidance issued by the Office of Management and Budget.

Many stakeholders emphasized that the NRC staff's process for evaluating revised editions and addenda of the ASME Code must be improved to provide more timely endorsement of updated ISI and IST methods. In response, the staff is preparing to evaluate the 1998 Edition of the ASME Code for incorporation by reference into the regulations. The staff believes that public confidence can be increased most directly by prompt endorsement of future ASME Code editions and addenda.

Reducing Unnecessary Regulatory Burden

The regulatory benefits to licensees if their ISI and IST programs are not required to be periodically updated are uncertain. If ASME Code improvements are not significant over the years, then the financial benefits to licensees could be sizeable. These

benefits include the reduced cost of preparing ISI and IST program updates, procedure revisions, and relief requests associated with a mandatory update. Some stakeholders estimated that the cost of updating ISI and IST programs exceeded \$1 million per plant every 10 years. On the other hand, if ASME Code improvements are significant over the years, then it is likely that the staff would conclude that a 10 CFR 50.55a update would be necessary and a new edition of the Code would likely pass a backfit test and be incorporated in 10 CFR 50.55a as a requirement. This would result in some licensees having to update their ISI and IST programs. In addition, burden reduction from the implementation of Option 1 may not be as large as expected because future savings resulting from elimination of relief request submittals every 120 months may well be offset by licensee costs of submitting relief requests to apply portions of future ASME Code editions and ASME Code cases which licensees deem to be desirable.

In applying the 1989 Edition of the ASME Code as the baseline, Option 1.A might allow more burden reduction than Option 1.B (1995 Edition with the 1996 Addenda) or Option 1.C (1998 Edition) because most licensees are currently implementing the 1989 Edition in their ISI and IST programs, but this savings could be mitigated by the submittal of additional relief requests to apply portions of later ASME Code editions and addenda, and ASME Code cases. Option 2 would maintain the current updating process. Hence, the burden associated with requiring updating of ISI and IST programs to currently endorsed editions of the ASME Code (and any new requirements that are not cost-justified) will be maintained. Option 2 could result in the imposition of an unnecessary regulatory burden if the ISI and IST programs are required to be updated to an ASME Code edition or addenda that does not include safety significant improvements from the ASME Code edition or addenda currently applied in those programs. Option 3 might provide less burden reduction than available under Option 1 in light of the need for licensees to demonstrate that their ISI and IST programs provide an acceptable level of quality and safety as an alternative to the 120-month update requirement. Overall, Option 1 provides the greatest flexibility for licensees to minimize their burden in a cost-effective manner, but could require additional NRC staff resources.

Making NRC Activities and Decisions More Effective, Efficient, and Realistic

If licensees are not required to update their ISI and IST programs, there would be no relief requests associated with those ISI and IST program updates submitted for NRC staff review. However, depending on the option selected, licensees would continue to submit alternatives to, or requests for relief from, ASME Code provisions as part of voluntary or mandatory updating, or requests to use portions of future ASME Code editions and addenda, or ASME Code cases. Some commenters believed that these submittals would increase if mandatory updating is eliminated. The staff considers the question of whether additional licensee submittals would result from modifying the 120-month ISI/IST update requirement to be speculative at this time and should not be crucial to the issue of modifying the update requirement.

In the staff requirements memorandum (SRM) dated June 24, 1999, the Commission directed that the staff address the implications of introducing backfit considerations to 10 CFR 50.55a relative to ISI and IST programs. In 10 CFR 50.109, the NRC established provisions for imposing backfit requirements on licensees of operating nuclear power plants. Under Option 1, the staff would determine on a quantitative and qualitative basis over time whether the collective improvements to the ASME Code warrant revision of the required baseline for ISI and IST programs in accordance with 10 CFR 50.109. This approach in revising the ISI/IST baseline would result in mandatory implementation of later ASME Code editions or addenda only when they provide safety-significant improvements in ISI and IST methods. Updating ISI and IST programs to ASME Code editions or addenda with less significant improvements or editorial changes would not be mandated. Option 1 would make updating of ISI and IST programs more consistent with the imposition of other new requirements for operating nuclear plants. In particular, the NRC regulations in 10 CFR 50.109 states, in part, that the Commission shall require backfitting when it determines that "there is a substantial increase in the overall protection of the public health and safety ... and that the direct and indirect costs of implementation for that facility are justified in view of this increased protection." In addition, the Charter of the Committee to Review Generic Requirements (CRGR) notes that the Commission has stated that the criterion in 10 CFR 50.109 regarding a substantial increase in the overall protection of the public health and safety is "flexible enough to allow for qualitative arguments that a given proposed rule would substantially increase safety." The CRGR Charter further states that "[i]ncorporation of industry standards (including revisions to existing codes and standards) into NRC rules or staff positions, as a prudent means of assuring continued conformance with currently voluntary standards and practices that provide substantial safety benefit, can provide the basis for a finding that a proposed backfit meets the 'substantial increase' standard of 10 CFR 50.109."

It should be noted that the updating costs apply only to ISI, IST, and repairs because construction and design aspects in Section III of the ASME BPV Code are not applicable to currently operating plants, absent a specific backfit requirement. Further, although not directly relevant to this issue, new plants would continue to meet the latest edition and addenda of the ASME Code incorporated by reference in the regulations on the date 12 months prior to the date of issuance of the operating license.

The NRC currently expends resources of approximately 1 full-time equivalent (FTE) on an annual basis to review new ASME Code editions issued every 3 years and to prepare rulemaking to incorporate those new ASME Code editions and their addenda into the NRC regulations. As part of that review, the staff determines whether specific ASME Code provisions meet 10 CFR 50.109 with respect to scope or accelerated implementation as a backfit requirement. If Option 1 is selected by the Commission, the staff will also review the new ASME Code editions and addenda to determine whether those improvements individually or cumulatively justify revision of the ISI/IST baseline requirements. Based on Option 1, the staff estimates that an additional one-time resource burden of FTE would be required for developing guidelines to evaluate changes to the ASME Code for determining the need to revise the ISI/IST baseline requirements. In addition, the staff estimates a recurring additional resource burden of FTE to evaluate ASME Code improvements against 10 CFR 50.109 to determine whether the baseline should be revised to reflect the latest Code edition and addenda. This would bring the total resource

burden under Option 1 to about 1 FTE annually in order to endorse the most recent ASME Code editions and addenda (including reviewing new ASME Code editions and their addenda, preparing rulemaking to endorse the new ASME Code editions, and identifying the need to backfit specific ASME Code provisions) and updating the ISI/IST baseline as necessary. If Option 2 is selected, the resource burden would remain 1 FTE annually to continue the staff's current practice of incorporating by reference the most recent ASME Code editions and addenda into the regulations. If Option 3 is selected, the staff estimates that an additional one-time resource burden of about FTE will be required to develop guidance for the successful application of plant-specific alternatives to the ISI/IST update requirement. The staff also estimates a recurring additional resource burden of FTE to evaluate individual licensee requests to not update their ISI and IST programs. Therefore, the total resource burden for Option 3 would be about 1 FTE annually to incorporate by reference the most recent ASME Code editions and addenda into the regulations, and to evaluate licensee requests not to update their ISI and IST programs.

Apart from the issue of updating ISI and IST programs, the staff is encouraging the use of risk-informed ISI and IST programs and development of ASME Code cases to implement these alternatives. In addition, the staff has a major initiative underway to revise 10 CFR Part 50 to be more effective in a risk-informed environment. The project includes rulemaking activities to reduce special treatment requirements for safety-related components of low safety significance. The staff is encouraging the standard-writing consensus committees (such as ASME) to participate in these industry and regulatory issues. ASME representatives have expressed the desire to be a part of these efforts. Further, the staff is evaluating the specifics of the ISI/IST process for areas of improvement. As an outgrowth of the activities to make 10 CFR Part 50 risk informed, the staff may propose additional improvements for the review and implementation of ISI and IST programs.

The current ISI/IST updating process has resulted in the development of distinct ISI and IST programs at each nuclear power plant. Modification of the 120-month ISI/IST update requirement would not deter licensees from submitting relief or alternative requests with respect to particular provisions of the ASME Code. Therefore, the staff does not believe that replacing the 120-month ISI/IST update requirement with a provision for voluntary updating would have a significant effect on the range of ASME Code editions and addenda applied by licensees. The Illinois Department of Nuclear Safety commented that the multiple levels of ISI and IST requirements specified as the 1989 baseline in the proposed rule published for public comment could cause confusion in their application.

The NRC and the industry have initiated efforts to incorporate the consideration of risk insights into ISI and IST programs at pilot plants and through the provisions of the ASME Code. As noted earlier, some commenters believed that modification of the 120-month ISI/IST update requirement would reduce participation on ASME Code committees. Those commenters raised concerns that reduced participation might disrupt the ongoing process to incorporate risk-informed concepts into the ASME Code. The staff recognizes these concerns but notes that the successful completion of the risk-informed initiatives for ISI and IST programs is a high priority for both the NRC and licensees. Therefore, the staff believes that the industry will continue to participate in the ASME-sponsored risk-informed initiatives. The staff will continue to participate in the ASME Code process and monitor the progress of the risk-informed ISI and IST initiatives to ensure that adverse impact on those initiatives is avoided.

Most States appear to rely on the NRC to establish requirements for ISI and IST programs at nuclear power plants. With respect to the issue of NRC versus State requirements, any inconsistency that might occur would be resolved by Federal preemption.