

January 13, 2000

Dr. Dana A. Powers, Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: DRAFT COMMISSION PAPER REGARDING 120-MONTH UPDATE
REQUIREMENT FOR INSERVICE INSPECTION AND INSERVICE TESTING
PROGRAMS

Dear Dr. Powers:

This memorandum is in response to your letter of December 8, 1999, to Chairman Meserve regarding the proposed rulemaking related to the 120-month update requirement for inservice inspection (ISI) and inservice testing (IST) programs. As you are aware, 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 American Society of Mechanical Engineers (ASME) Code incorporated by reference in 10 CFR 50.55a and in effect 12 months before the start of the new 120-month interval. 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 for 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. On December 2, 1999, the staff met with the Advisory Committee on Reactor Safeguards (ACRS) to discuss the public comments received on the proposed rule, the options described in a draft Commission paper on the 120-month ISI/IST update requirement, and the staff's recommendations regarding that requirement. During its December 2, 1999, meeting, the ACRS also received presentations by the ASME and the Nuclear Energy Institute (NEI) on this matter.

In the draft Commission paper, the staff identified the following three options:

- (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 regulatory 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.

In the NRC staff presentation to the ACRS, the staff recommended the implementation of Option 1.B.

Your letter dated December 8, 1999, to Chairman Meserve, forwarded the ACRS recommendation that the Commission adopt Option 2 as described in the draft Commission paper and retain the 120-month update requirement for ISI and IST programs. 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. Also, our current practice of requiring updating of ISI and IST programs 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.

Dr. Powers

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Based on the above discussion, the staff has decided to retain its recommendation for implementation of Option 1.B in the Commission paper. If you would like to discuss this matter in more detail, please contact Jack Strosnider, Director, Division of Engineering, NRC Office of Nuclear Reactor Regulation, at 301-415-3298.

Sincerely,

/RA/

William D. Travers
Executive Director
for Operations

cc: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
SECY

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