UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

June 5, 1996

NRC INFORMATION NOTICE 96-32: IMPLEMENTATION OF 10 CFR 50.55a(g)(6)(ii)(A), "AUGMENTED EXAMINATION OF REACTOR VESSEL"

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to certain aspects of scheduling and implementing the augmented reactor vessel examination required by Section 50.55a(g)(6)(ii)(A) of Title 10 of the Code of Federal Regulations (10 CFR). It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Background

Because of concerns regarding the scope of inspection of reactor vessels, the NRC issued, in 1992, 10 CFR 50.55a(g)(6)(ii)(A), "Augmented Examination of Reactor Vessel" [hereinafter referred to as Paragraph (A)], which contains new requirements for an augmented examination of reactor vessels. The rule requires licensees to implement, before the time required by normal updating of the inservice inspection (ISI) program, provisions in the 1989 Edition of the American Society of Mechanical Engineers, Boiler and Pressure Vessel Code (ASME Code), Section XI, to examine "essentially 100%" of the length of all reactor vessel shell welds. Licensees with fewer than 40 months remaining in the ISI interval that was in effect on September 8, 1992, may defer the augmented reactor vessel examination to the first period of the next ISI interval [Paragraph (A)(3)]. "Essentially 100%" examination is defined in Paragraph (A)(2) as "more than 90% of the examination volume of each weld" [emphasis added].

Licensees unable to completely satisfy the requirements for the augmented reactor vessel examination must propose an alternative that would provide an acceptable level of quality and safety. The proposed alternative may be used when authorized by the Director of the Office of Nuclear Reactor Regulation (NRR) [Paragraph (A)(5)].

The 1989 Edition of the ASME Code, Section XI, incorporated Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems." Appendix VIII was developed to ensure the effectiveness of ultrasonic examinations through a performance demonstration to evaluate the adequacy of procedures, equipment, and personnel for detecting and sizing flaws during examinations. Licensees are not currently required to implement Appendix VIII.

Description of Circumstances

It became evident to the staff while it was conducting ISI reviews that some licensees were unaware of or uncertain about some aspects of the augmented reactor vessel examination rule.

The staff learned that a small number of licensees were unaware of the rule and its requirements for some time after it was published. Licensees need to be aware of the schedular requirements of the rule to ensure timely implementation of its provisions. Because of the scope and extent of the examination, significant planning is necessary to address the technical, schedular, and regulatory issues associated with a comprehensive examination of the reactor pressure vessel.

This information notice contains a discussion of certain areas of misinterpretation that the staff has dealt with in the implementation of the augmented reactor vessel examination rule.

Discussion

Schedular Requirements of the Rule

In one instance, a licensee original 10-year ISI interval end date allowed deferral to the first period of the next interval. However, this licensee experienced an extended shutdown and, as permitted by Section XI, extended the ISI interval to complete the examinations required for the interval. As a result, more than 40 months remained in the interval in effect on September 8, 1992, and the licensee would have been required to do the examination sooner than expected. The licensee requested and was granted approval by NRR to schedule the examination in accordance with the original 10-year ISI interval end date to allow for proper scheduling and to ensure the availability of examination equipment.

"Essentially 100%" Examination Standard

Most licensees are finding that while the overall average examination coverage for reactor vessel shell welds may be more than 90%, examination coverage for individual welds may be substantially less than 90%. When a licensee is unable to examine "essentially 100%" of each shell weld, it must seek NRC authorization of an alternative in accordance with Paragraph (A)(5).

During discussions with the NRC staff regarding the review of the 10-year ISI program plan, a licensee stated that it had obtained "essentially 100%"

coverage of the total volume of the reactor vessel shell welds but coverage of less that 90% of several individual welds. Contrary to the requirements of the rule, the licensee did not submit a request for authorization of an alternative to the NRC as required by the rule, until asked to do so by the NRC.

"Spirit of Appendix VIII" Examination

Section XI contains rules for evaluating the significance of flaws identified through non-destructive examination. Flaws that are of such size that they cannot be dispositioned through comparison with code tables must be analyzed in accordance with Section XI, Paragraph IWB-3600, "Analytical Evaluation of Flaws." Furthermore, Section XI, Paragraph IWB-3134(b), "Review by Authorities," requires that analytical evaluations performed in accordance with Paragraph IWB-3600 be submitted to the regulatory authority having jurisdiction at the plant site (i.e., NRC).

One licensee administered a "Spirit of Appendix VIII" performance demonstration for the procedures, personnel, and equipment to be used for the augmented reactor vessel examination. This type of examination essentially satisfies the technical requirements of Appendix VIII and would be expected to yield more accurate and reliable inspection results. The licensee concluded that the performance demonstration resulted in examination and evaluation techniques that surpassed the conventional techniques of Section XI of the ASME Code and Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations." During the augmented reactor vessel examination, the licensee identified 15 flaws in the shell welds and in the shell-to-flange weld outside the scope of the augmented reactor vessel examination, which required analytical evaluation in accordance with Section XI, Paragraph IWB-3600. The licensee stated that if the conventional techniques of Section XI and Regulatory Guide 1.150 had been used, 12 of these 15 flaws would not have even been recordable and only 2 of the remaining 3 flaws would have required analytical evaluation in accordance with Paragraph IWB-3600. This licensee experience indicates that flaws of sufficient size to require analytical evaluation may not be detected when using conventional techniques for the augmented reactor vessel examination.

Although the licensee in the above example submitted a request for authorization of an alternative as the examination coverage was less than "essentially 100%," it did not submit the flaw evaluations, as required by the ASME Code, until asked to do so by the NRC.

Need for NRC Authorization of Alternatives

A licensee unable to obtain the required examination coverage quoted 10 CFR 50.55a(g)(4) as a basis for not seeking NRC authorization of an alternative as required by Paragraph (A)(5). However, 10 CFR 50.55a(g)(4) states, in part, that "components. . . must meet the requirements. . . to the extent practical within the limitations of design, geometry and materials of construction of the components." As with relief requests for other Code components for

incomplete or partial ASME Code-required ISI examinations, NRC authorization is required when all the examination requirements of Paragraph (A) are not met.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate NRR project manager.

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Attachments:
1. Referenced Codes and Standards
2. List of Recently Issued NRC Information Notices

Attachment Filed in Jacket.

Referenced Codes and Standards

1. Title 10 of the Code of Federal Regulations (10 CFR), Section 50.55a(g)(6)(ii)(A), "Augmented Examination of Reactor Vessel"

2. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1989 Edition.

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
96-31	Cross-Tied Safety Injection Accumulators	05/22/96	All holders of OLs or CPs for pressurized water reactors
96-30	Inaccuracy of Diagnostic Equipment for Motor-Operated Butterfly Valves	05/21/96	All holders of OLs or CPs for nuclear power reactors
96-29	Requirements in 10 CFR Part 21 for Reporting and Evaluating Software Errors	05/20/96	All holders of OLs or CPs for nuclear power reactors
96-28	Suggested Guidance Relating to Development and Implementation of Corrective Action	05/01/96	All material and fuel cycle licensees
96-27	Potential Clogging of High Pressure Safety Injection Throttle Valves During Recirculation	05/01/96	All holders of OLs or CPs for pressurized water reactors
96-26	Recent Problems with Overhead Cranes	04/30/96	All holders of OLs or CPs for nuclear power reactors
96-25	Transversing In-Core Probe Overwithdrawn at LaSalle County Station, Unit 1	04/30/96	All holders of OLs or CPs for nuclear power reactors
96-24	Preconditioning of Molded-Case Circuit Breakers Before Surveillance Testing	04/25/96	All holders of OLs or CPs for nuclear power reactors
96-23	Fires in Emergency Diesel Generator Exciters During Operation Following Undetected Fuse Blowing	04/22/96	All holders of OLs or CPs for nuclear power reactors

OL = Operating License
CP = Construction Permit

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Technical Editor reviewed and concurred on January 23, 1996.

JHConran of CRGR reviewed on January 11, 1996, and determined that subject matter was appropriate for an information notice.

OGC has no legal objections (editorial changes incorporated) per conversation with EJSullivan on 5/13/96.

*See previous concurrence
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