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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemakings and Adjudications Staff

Subject: Docket ID NRC-2008-0554, 10CFR50 Proposed Rule

Reference: Federal Register /Vol. 75, No. 85/Tuesday, May 4, 2010

To Whom It May Concern:

In the referenced issue of the Federal Register, the Nuclear Regulatory Commission (NRC) proposes to amend its regulations by incorporating by the ASME Boiler and Pressure Vessel Code, 2005 Edition through the 2008 Addenda of Sections III and XI, in addition to several other modifications to 10CFR50.

While the NRC's efforts to more frequently incorporate later Editions and Addenda of the ASME Codes should be of significant benefit to industry, I would like to comment regarding the NRC's proposal to not approve one of the more beneficial provisions of the referenced Code.

Page 24338 of the Referenced Federal Register contains the following statement:

"In the newly designated 50.55a(b)(2)(xv), the NRC is also proposing to impose the condition that paragraphs IWA-4520 (b)(2) and IWA-4521 of the 2007 Edition of Section XI, Division 1, of the ASME B&PV Code, with the 2008 Addenda are not approved for use."

These paragraphs would allow the use of ultrasonic examination (UT) to be performed in lieu of radiographic examination (RT) for repair/replacement of Code Class components. It is my opinion that the NRC should not withhold approval of these paragraphs based on the following points:

1) The NRC states that "Substitution of UT for RT... is of a concern to the NRC because, depending on flaw type (i.e. volumetric or planar) and orientation, UT and RT are not equally effective for flaw detection and characterization."

   Comment: It is certainly true that UT and RT are not equally effective for flaw detection and characterization. However, contrary to the NRC's implications, based on industry

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experience, UT is typically deemed ***more effective*** than RT for flaw detection. UT may not be as effective as RT for flaw characterization, however for repair and replacement activities in operating reactors, it would seem logical to use UT examinations in conjunction with ASME Section XI style acceptance criteria (flaw analysis based on size, location, and significance) for operating reactors, than to use Construction Code style acceptance criteria (based on workmanship standards, which require flaw characterization and may or may not have significance relative to component integrity). If NRC is truly interested in detecting flaws and analyzing those flaws with respect to their impact on operational safety, the NRC should require UT where practical rather than allow RT for these repair and replacement activities.

2) The NRC states that "RT is effective in detecting volumetric-type flaws (e.g. ...), planar type flaws with large openings (e.g. ...), and those flaws that are oriented in a plane parallel to the X-ray beam. ... In contrast, UT is most effective in detecting and sizing planar-type flaws associated with inservice degradation due to, for example, fatigue or stress corrosion cracking."

   Comment: While it is agreed that RT is effective in detecting certain types of flaws, it should be noted that there are few studies that have actually attempted to measure or demonstrate the effectiveness of RT in a manner comparable to the way the effectiveness of UT has been demonstrated via ASME Section XI, Appendix VIII.

   The quoted NRC statements imply that UT is not effective for detection or sizing of volumetric-type flaws or planar-type flaws with large openings. UT can be very effective in detecting and sizing volumetric flaws and other fabrication induced defects if the techniques are applied properly. During the preservice examinations performed in the US in the 1970s and early 1980s, there were many examples of fabrication flaws that were detected with UT that were not identified by RT. There were also many examples of flaws that were detected with UT which were later correlated with acceptable RT results. Unfortunately, although the occurrence of these examples is well known, specific documentation is probably not readily available at this time since most of these examples occurred over 25 years ago. Unfortunately, since there was no requirement to correlate acceptable construction RT results with preservice UT results, the number of flaws that may have been acceptable based on the RT results but missed with UT is unknown. It should also be noted that these preservice UT examinations were performed with UT procedures that had not be "performance demonstrated" in accordance with current Code requirements.

   The quoted statements also imply that UT is better suited for detection of planar flaws than volumetric flaws. While UT is better than RT for detection of planar flaws, UT is actually better for detection of volumetric flaws than it is for detection of planar flaws. A very simple example would be a comparison of the anticipated UT response from a mid-wall side-drilled hole versus the anticipated UT response from a mid-wall planar reflector. Unless the planar reflector was oriented normal to the sound beam, and holding other variables constant, one would expect a much smaller response from the planar reflector.

3) The NRC addresses the limitations of UT on cast stainless steel components and states that "...the ASME Code provisions addressing the inspection of cast stainless steels are still under development and are, therefore, not yet published for use."

Comment: The limitations regarding use of UT in cast stainless steel materials is well known and is a valid concern where those materials are used. However, it seems logical to allow UT to be performed on those materials where it is known to be more effective than RT instead of continuing to require RT on those materials. Also, it should be noted that "inspection" requirements (what, when, and how to inspect) for cast stainless steel materials are currently addressed in the ASME Code. It is the UT "qualification" requirements (procedure demonstration) for cast stainless steel materials that are still under development.

4) The NRC states "Finally, UT requires more surface scanning area that RT to perform examinations."

Comment: While it is true that UT requires more access and may also require more weld surface preparation that RT, the other peripheral benefits of UT (or disadvantages of using RT) should not be ignored, some of which are:

a. Use of RT requires isolation areas and work area restrictions that are not required when performing UT.
b. Time required to perform UT is typically much less than needed to perform RT.
c. The performance of RT includes some amount of inherent radiation exposure (and some risk of accidental over-exposure) that do not occur with UT
d. RT sources are known to be a potential national security risk and restrictions on their storage and use have increased considerably in recent years. The use of UT rather than RT will minimize the risk to national security associated with transportation and use of these radiographic "Quantities of Concern".

5) The NRC states "To ensure that a UT technique would be capable of detecting typical construction flaws, the NRC would require a licensee to demonstrate, through performance-based ASME B&PV Code, Section XI, Appendix VIII-like requirements, its capability of identifying the construction flaws which are easily detected by RT."

Comment: Appendix VIII was designed to test the capabilities of UT systems (techniques, equipment, and personnel) under blind conditions. The effectiveness of RT systems (techniques, equipment, and personnel) have not undergone this type of rigorous blind testing qualification program, so although the RT techniques may be capable of "easily detecting construction flaws", no consideration is given to the potential negative effects that personnel may have on the overall effectiveness of an RT system. The premise that UT systems would need to undergo an Appendix VIII style qualification/demonstration program for construction flaws prior to use seems illogical when RT examination systems have not undergone a similar rigorous qualification program to date. It also seems illogical that RT systems would continue to be mandated

for use in repair and replacement activities when the RT systems have not been subjected to a similar performance demonstration program.

6) The NRC states their concern that "... using the second leg of the ultrasound metal path (V-path) to achieve two direction scanning from only one side of the weld may not be adequate in detecting construction flaws."

   Comment: This concern is valid, especially for austenitic stainless steels and nickel alloys, and may be a basis for limiting the use of UT in these materials when only one side of a weld is accessible. The ability to detect certain types of smooth flaws (e.g. lack of fusion) that are oriented parallel to the sound beam on the second leg of the V-path may be limited when using manual conventional UT techniques. More advanced UT techniques (e.g. automated phased array) offer improved ability to detect such flaws but there is not a significant amount of industry experience to validate that improvement, nor is the current Appendix VIII implementation program (The Performance Demonstration Initiative) capable of currently administering such a qualification. However, even considering these limitations, it would seem logical to allow UT to be performed on materials and components where UT is known to be as effective, or more so, than RT.

Considering the above, instead of blanket disapproval, the NRC should consider approving the substitution of UT for RT with specific conditions or limitations, such as:

1) UT may not be used in lieu of RT for examination of cast stainless steel or austenitic stainless steels and nickel alloys where only single-sided access is available,
2) When UT is used in lieu of RT, the acceptance standards of ASME Section XI IWA-3000 shall be used in lieu of the construction code acceptance standards, and
3) Encoded or automated UT shall be used to create a permanent record which would allow multiple analysis reviews as well as document the results for comparison with future examinations.

This approach would provide benefits to licensees in many cases, but would restrict the use of UT in situations where it is known to be less effective than RT.

Sincerely,

Grady Lagleder

Grady Lagleder
President
IHI Southwest Technologies

Rulemaking Comments

From: Grady Lagleder [Glagleder@ihiswt.com]
Sent: Friday, July 16, 2010 12:40 PM
To: Rulemaking Comments
Subject: Docket ID NRC-2008-0554, 10CFR50 Proposed Rule
Attachments: NRC Letter 7-16-2010.pdf

Please see the attached letter containing comments regarding the subject Docket ID. The Proposed Rule was published in the Federal Register, Vol. 75, No. 85, on Tuesday May 4, 2010.

Thank you,
Grady Lagleder
IHI Southwest Technologies
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