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NS-TMA-2122

October 3, 1979

Mr. Samuel J. Chilk
Secretary of the Commission
U.S. Nuclear Regulatory Commission
1717 H Street
Washington, D.C. 20555



Attention: Docketing & Service Branch

Dear Sir:

Westinghouse would like to take this opportunity to submit written comments and suggestions with respect to the draft regulatory guide "Ultrasonic Testing of Reactor Vessel Welds During Inservice Examination," Task SC 705-4.

In the attachments Westinghouse has carefully reviewed the draft regulatory guide and has identified several areas where revision is justified. Comments on the value impact assessment are also provided.

If you have any questions, please do not hesitate to call.

Very truly yours,

T. M. Anderson, Manager
Nuclear Safety Department

M. A. Haley/keg

Attachments

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Attachment 1 to NS-TMA-2122

COMMENTS ON DRAFT REGULATORY GUIDE "ULTRASONIC TESTING OF REACTOR VESSEL WELDS DURING INSERVICE ESAMINATION"

Instrument Performance Checks

- The first paragraph in Section B.1 discusses recording and thus should be moved to Section B.7.

- The guide takes exception to the ASME Code time interval between instrument performance checks of "at the beginning of each period of extended use (or every three months, whichever is less)" and proposes that these checks be performed, as a minimum before and after each pressure vessel examination. Westinghouse agrees with this provision of the guide.

- The statement concerning demonstration of the proportionality of the signal response to different sizes of reflectors at 1/4, 1/2, and 3/4T is not clear. In addition to the linearity checks required by the Code, the NRC has specified that frequency-amplitude and pulse shape data be verified before and after each vessel examination. Collecting frequency-amplitude data requires use of specialized instrumentation under laboratory conditions. Changes in instrumentation, cable, or test material can alter the frequency spectrum. Therefore, unless every possible instrument/cable search unit/test material combination is evaluated, the measurements will have no meaning. If these variables are not considered, the search unit spectrum analysis supplied by equipment manufacturers will serve to satisfy this requirement. Further, since the Commission has placed no criteria for acceptance/rejection on this evaluation, this data serves no useful purpose. Westinghouse recommends deletion of this requirement from the guide.

- Clarification of the pulse shape requirement is necessary. It is not clear how this measurement will be made, what significant data will be collected, or how this information will be used to evaluate instrument performance.

Calibration

- The duties of the Authorized Inspector (AI) include approving the ISI program including calibration techniques. AI's have witnessed initial calibration programs and use of EBS (Electronic Block Simulator) equipment. NRC compliance personnel have visited Westinghouse facilities to review calibration and use of EBS equipment. Owner QA programs provide for audit of calibrations preparatory to in-service inspection programs. The EBS is integral to a calibration program when it is used and the program must meet the requirements in the code. An EBS does not stand alone, all calibrations are recorded in tabulated form. The written or tabulated record of calibration is the primary reference for controlling the calibration. So in reality, controls do exist at the present time. Westinghouse has completed qualification testing on the EBS system, employing state-of-the-art-components and design. WCAP 9545, which describes the EBS and tests which confirm its stability will be forwarded under separate cover.

The NRC has failed to mention that although simulators may be used for calibration checks, the entire test system must eventually be calibrated against the basic reference block. Calibration errors because of simulators would be easily identified during this sequence. Until more specific details are provided, this concern cannot be addressed by the industry.

- We agree with the Regulatory Positions which recommend:

  a. Manual calibration for manual scanning, automated calibration for automated scanning, and calibration at the scanning speed.

  b. "Double DAC'ing" in instances where amplitudes from the reference holes are less than 20% of full screen height.

  c. Calibration checks each time a component is changed in the system, and

  d. Protection of a reference reflector surfaces.

Near Surface Examination and Surface Resolution

- The draft guide states "The capability to effectively detect defects near the front and back surfaces of the actual component should be estimated." It also specifies that gating, decay time, clad/base metal interface, surface roughness, and other factors be considered in this estimate. Rather than require inspection agencies to provide a "best guess" concerning these capabilities, it would be more appropriate to require additional reflectors near the front and back surfaces of the reference block to actually provide a demonstration of the system detection performance. This would eliminate the need to interpret the guides terminology "effectively examined" and assure that the evaluations are thus consistent.

Beam Profile

- The draft Regulatory guide requires that beam profile "be determined if any recordable flaws are detected." In the "Discussion" section of the Guide we find, "The beam profile needs to be determined and recorded so that comparisons may be made with successive examinations." These requirements are not consistent and require clarification.

- The clad/base metal interface has a very definite effect on the beam profile. The profile will not be the same at any two points, thus its use as a correction factor will not provide consistent defect sizing.

Scanning Weld Metal Interface

- The Commission should provide specific procedures for the use of tandem techniques.

- The "Discussion" section requires that during the 0° back reflection examination, reductions of amplitude of 50% be investigated by angle beam in increments of 15° until the signal reduction is explained. This requirement is merely an exercise. Losses in back reflection amplitude are common during reactor vessel inspection and are the result of many inconsequential factors. Irregular clad surfaces, clad/base metal

interface problems, and changes in geometry all will have the effect of decreasing the back reflection amplitude. This requirement will result in significant additional effort with little or no technical benefit, and it is therefore recommended that it be deleted from the Regulatory Guide.

Sizing

- The guide states, "It is recommended that indications that are associated with through thickness flaws and do not meet code allowable criteria or criteria set down in this guide be sized at 20% DAC as well as 50% DAC." This requirement serves no purpose since an indication which is unacceptable when sized to 50% DAC will only be "more unacceptable" when sized to 20% DAC. This requirement should be deleted.

- Going to a 20% DAC sizing standard and recording to 10% DAC limits will have the undesirable effects of grossly exaggerating recorded flaw sizes, additional radiation exposure, and increased recording time. There is no reason to believe that collection and recording of these additional data points will enhance the flaw sizing capabilities of present ultrasonic techniques. Conservatism built into ASME XI acceptance criteria has been ignored in this section of the guide. Prior to initiating requirements that will add unnecessary conservatism and result in very high additional costs, the NRC should provide technical justification.

Reporting of Results

- The value and consistency of "best estimates" of error bands in sizing and "best estimates" of volumes not "effectively examined" are questionable. Estimates of this nature are based on the experience of the individual and depend on a multitude of factors, and as such are very subjective. The reasons for variance in these estimates by different inspection agencies will be difficult to substantiate, and thus they will be of little or no value.

Attachment 2 to NS-TMA-2122

COMMENTS ON THE VALUE IMPACT ASSESSMENT OF DRAFT REGULATORY GUIDE "ULTRASONIC TESTING OF REACTOR VESSEL WELDS DURING INSERVICE EXAMINATION"

There is no basis for the position that implementation of the provisions of this guide will provide advantages, such as:

1. Greater accuracy and consistency in flaw characterization.

2. Consistent flaw characterization by NRC.

3. Better assessment of flaw growth.

4. More reliability in detection and evaluation.

5. Reduced licensing time for review of results.

6. Avoid unnecessary repairs.

7. Reduced margins of error in estimates of flaw growth.

8. More consistent characterization procedures.

On the contrary, we expect implementation of the guide will confuse issues such as flaw sizing and characterization, increase inspection time, increase the potential for unnecessary repairs, and significantly increase radiation exposure to inspection personnel. A great deal of additional data will be generated with no guidelines for systematic evaluation of that information.

Cost estimates for implementation of the guide have been considerably underestimated. We expect the 20% recording and 10% sizing criteria will have a significant impact even if recording is not necessary. Additional time is required to determine whether the indication is recordable. Each time a reflector greater than 20% DAC is detected, the scanning process must be stopped to determine the length and through-wall dimensions of the reflector. If the size exceeds the criteria defined in the guide, the reflector must be recorded. If the reflector size is smaller, the scanning process may proceed. The search process, however, requires additional inspection time.

The argument that the 20% DAC recording and sizing will only find service induced defects because ASME III radiographic standards prohibit defects having lengths greater than the 3/4 inch is technically incorrect. The Commission has failed to recognize that ultrasonic and radiographic examinations are complementary and results do not always correlate.

We agree that some of the concerns which prompted the Commission to generate this document are legitimate. The capabilities of current ultrasonic testing methods in the areas of defect detection, location, and sizing have not been firmly established. We do not agree, however, that implementation of this guide will enhance our knowledge in any of the above areas.

To satisfy that goal requires a comprehensive study of the entire ultrasonic test system as applied to vessel weld inspection designed to firmly establish the capabilities of current test methods. If improvement is necessary, the program could be extended to systematically analyze the test system for identification of areas where improvement is necessary and provide proper corrective action.

In summary, the proposed guide will very likely add considerable cost to periodic inservice inspection of reactor vessels which will far outweigh any benefits that might result.