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Secretary of the Commission
U. S. Nuclear Regulatory Commission
Attention Docketing and Services Section
Washington, DC 20555

December 17, 1979

Gentlemen:

We are pleased to submit our comments on draft Proposed Regulatory Guide "Ultrasonic Testing of Reactor Vessel Welds During In-Service Examination," NRC Task SC 705-4, dated May 1979.

SECTION B

Paragraph 2a

The status of Article 4 (T-432.1.2), Section V of the ASME Code, 1977 Edition should remain unchanged.

The philosophy behind the use of only one point on Distance-Amplitude Correction curve (DAC) for a calibration check is to guard against possible instrument drift - either gain or sweep, or any inadvertent change of the instrument controls - all of which would be immediately obvious with a one-point check.

Paragraph 2b

The use of mechanical or electronic simulators should be allowed in accordance with Subarticle T-432.1.3 of Article 4, ASME V, 1977 Edition.

It is true that the mechanical or electronic simulator could be any device that provides an electrical signal. However, it is not necessarily true that uncertainty results. A mechanical simulator can provide a reference signal, which, though undefined from a quantitative point of view, will at least remain constant and, therefore, useful for the purpose for which it is intended. It is used for purposes of comparison only.

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Paragraph 2c (1)

We recommend that the electronic simulator parameters, which are required to be defined in Subarticle T-432.1.3 of Article 4, ASME V, 1977 Edition, be limited to stability with respect to both time and pulse height.

There is no need to define any of the electronic parameters of the electronic simulator except for stability. Defining the pulse voltage in terms of a standard source of reference is meaningless. The important factor is that the pulse height produced on the screen be correlated with the original calibration on the basic calibration block during the original calibration, as called for in Subarticle T-432.1.3 of Article 4, Section V ASME Code, 1977 Edition. Thus, a stable reference will be established, against which any change in test parameters can be determined.

Paragraph 2c (2)

We recommend that the status of Subarticle T-432.1.3, Section V of the ASME Code, 1977 Edition, remain unchanged.

Checking transducer sensitivity, either separately or in combination with the entire test system, will not affect the problems cited, which will exist either way. If sensitivity of the transducer is defined as amplitude of signal resulting from a standard reflector, then it is not important, as signal height can be adjusted to any convenient value. Thus, adjustment of the instrument gain can be used to compensate for any deficiency in transducer sensitivity. Signal amplitudes are meaningful only for comparative purposes under similar test conditions and are, therefore, independent of such factors as transducer sensitivity.

SECTION C

Paragraphs 1.1. and 1.2

Determination of screen height and amplitude linearities should not be limited to the methods outlined in Article 4. Optional methods should be allowed, providing that equivalency or superiority can be demonstrated.

Paragraph 1.3

Frequency-Amplitude curves are useful, at the time of purchase of a transducer, simply to verify the normal frequency of the unit. This should be supplied by the vendor. Aside from this one purpose, the data called for in this paragraph appears to have no value.

Paragraph 1.4

The purpose served by a record of the unloaded pulse shape is not clear. Such information would bear little relationship to the loaded pulse shape, which would vary unpredictably when loaded with different transducers. Reference to "test point at which it is obtained" is irrelevant, as no test point is involved.

Paragraph 4

We suggest that caution be exercised when using beam profile in an attempt to size flaws. When the flaw is smaller than the sound beam diameter, the relationship between beam profile and flaw is, at best, somewhat nebulous. When the area of the flaw is large, as compared to the sound beam diameter, the boundary can be determined by the half-peak amplitude method to a fair degree of accuracy, but this determination is independent of beam spread, or profile. Placing undue reliance on the use of beam profile in sizing of flaws may well result in a false sense of confidence in the results obtained, particularly if they are to be used for purposes of stress analysis. Alhough Article 4 of Section V of the ASME Code outlines a procedure for the determination of beam profile, the value of these data is unclear.

Stone & Webster Engineering Corporation appreciates this opportunity to contribute to the improvement of this Proposed Regulatory Guide.

Very truly yours,

S. B. Jacobs
Chief Licensing Engineer

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