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*PR-Misc. Notice
Reg. Guide*

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing and Service Branch

Gentlemen:

Lambert, MacGill, Thomas, Inc. offers the following in response to solicitation for comments concerning Task SC 705-4, "Ultrasonic Testing of Reactor Vessel Welds during Inservice Examination."

Introduction

Lambert, MacGill, Thomas, Inc. is a privately held corporation founded in 1977 by senior engineers and specialists in the nondestructive examination of nuclear components and systems. The experience of the company principals spans 27 calendar years and includes work at most of the power reactors, fuel manufacturing facilities, and hot laboratories in the United States. Because of this lengthy and diversified experience I feel qualified to offer these comments on Task SC 705-4 for your consideration.

General

The draft regulatory guide, rather than stating requirements for vessel examination, requests data and is in effect an outline for a development program. It requires the examination agency and the utility to perform extensive data-gathering without identifying a specific need for the data, offering rules for its use once gathered, or setting methods for its collection and presentation. Rather than reducing the amount of examinations and evaluations required by the licensing process it appears this regulatory guide will significantly increase them, primarily due to the number of trivial operations added, each required its own lengthy paperwork support.



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In an attempt to justify this added activity the writers must first establish that ultrasonic testing is not reliable, and to do this they have drawn carefully selected references from the literature, choosing most from foreign sources while neglecting those state-of-the-art inputs from American technology which find ultrasonic testing to be a reliable examination method not only for nuclear applications but in aircraft, ship, structural and piping construction, and maintenance. Their conclusion that there is a basic problem of reliability with the ultrasonic method, which can be solved by data gathering, is difficult to accept. Perhaps because of this the regulatory guide is laced with escape words and phrases such as "may be", "desirable", "partly due", "should be considered", and so forth, when setting forth arguments for these increased activities.

It appears that the draft regulatory guide has been prepared not to improve this method but to increase understanding and acceptance of it within the NRC. The use of a regulatory guide for this purpose is doubly unfortunate. There is not only a tremendous cost involved ensuing from performing work which does not contribute to the timely completion of an already expensive product and the delay associated with bringing a multitude of trivial audit points into the licensing chain, but by concentrating heavily on peripheral technical points the NRC ignores the most basic and continuing problem concerning nondestructive examination in the nuclear industry, that of personnel competency and corporate responsibility.

Discussion

A few specific comments are offered to illustrate the above observation that the guide addresses itself to very minor points and data gathering.

A. Comments on the Discussion Portion of the Draft

Comment 1 to
Page 6, Para. (2)
Secondary DAC

In practice, the DAC curve is most often terminated because of a poor signal-to-noise ratio. Increasing gain does not improve this situation. A regulatory guide should recognize this condition and state at what point a DAC should be terminated, as was done at one time

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in ASME XI, Appendix I (Summer 1975, I-4423). The guide does not state that the use of two sensitivities implies scanning at two sensitivities, thereby doubling either the test time or the equipment required.

Comment 2 to
Page 6, Para. (4)
Calibration Holes

Surface changes to a block are easily measured and have reproducible effects. The regulatory guide should state acceptable limits to these effects as well as all block tolerances. A requirement for unchanged surface condition implies a measurement, maintenance, and documentation program on each block. More serious surface changes may happen to the vessel.

Comment 3 to
Page 7, Para. (3)
Near Surface Examination and Surface
Resolution

The relation between frequency and resolution is well established as are the effects of plastic or liquid delay lines upon the ultrasonic beam. A regulatory guide should state requirements to ensure coverage on all tests, as is done in structural welding codes. Without this, the requirement for a best estimate invites individual interpretation which may or may not be accepted by the NRC.

Comment 4 to
Page 7, Para. (4)
Beam Profile

The regulatory guide should specify acceptable beam profiles. The ASME procedures recommended in this draft have been in effect some time and several years of measurement of this parameter should already have generated sufficient data for competent

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researchers to prepare procedures for its use in evaluation. Unless this is done, beam profiling on a routine basis will continue to be waste. Should a beam profile be required for an evaluation of an indication it can be performed on selected transducers at that time.

Comment 5 to
Page 9, Para. (6)
Sizing

This section, tutorial in tone, is extremely vague and the effects on examination time may be extreme. How shall the one inch be measured since beam spread varies with metal path? Is the 20% of DAC indication level required to be continuous or intermittent as one indication is traversed? What scanning and recording sensitivity is now required? What about the effect of vessel curvature on beam spread?

B. Comments to the Regulatory Position Portion of the Draft.

Comment 1 to
Page 11, Para. (1.3)
Frequency Amplitude
Curve

The regulatory guide should first state which frequency response curve is required, the transducer, instrument, or system; then the guide should define an acceptable response. Until this is done, this type of work is only very expensive data collection. It will enlarge the instrumentation system appreciably and introduce an entire new Quality Assurance area into the examination.

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Comment 2 to
Page 12, Para. (3)
Near Surface Exam-
ination and Surface
Resolution

The basis for the requirement that a beam be almost perpendicular to the weld interface is not clear. The discontinuities to be detected with this beam orientation are contained within the weld and arise and should be detected and corrected during fabrication. These are not a major consideration in inservice inspection. It is surely more important to detect fatigue or stress corrosion cracking which first appears at the material surface and results in a corner reflector. The writers should also note that vessel curvature prevents an angle beam from being within 15° of the perpendicular on many vessel longitudinal welds.

Comment 3 to
Page 14, Para. (6.6)
Traveling Indications

Traveling indications are indeed highly significant, but this paragraph is not consistent with Page 9, Para. (6), and neither considers corner reflectors which represent the most significant type of indication. The ASME procedures required in Paragraph 4 of the Regulatory position use the 50% of DAC point as a reference level for beam spread determination and are therefore not compatible with this paragraph. Finally, there is no standard for evaluating low level indications.

These are examples to illustrate the contention that the draft guide is not technically suitable to be applied in the field. It does not possess sufficient precision to fulfill its function and will result in excessive attention to details and technical

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curiosities which have to date not been shown to have any identifiable effect on an ultrasonic examination. Attempts to fulfill the requirements of this guide will be entirely subject to the interpretation of individuals which will result in a lack of consistency thereby diluting efforts to maintain uniform performance standards.

If we are all playing different games, how do you determine the winner?

It is essential that the NRC, through its regulatory guides, set explicit standards to be met in the field. When this is done the so-called inconsistencies of ultrasonic testing will begin to disappear. Then the more serious problem of performance evaluation can be attacked. In other sensitive areas regulated or controlled by the government (the military, commercial aircraft, and ship repair) firms and individuals must be directly approved by the regulating authority. Only in the energy field has unrestricted "price only" competition been allowed. The results of this policy have been horrendous, and yet the regulatory guide unfortunately ignores this entire situation.

A final comment. The value statement assumes that positive results will be obtained and that more uniform data reporting will result from the implementation of the regulatory guide. To say the least, this assumption does not appear warranted. It appears rather that implementation of this guide will further complicate the licensing process, without clear benefit. In this way through the years we have so slowed nuclear development that the energy crisis is largely a nuclear crisis. If the many plants that have been cancelled or set back were now on line and operating, our country would not now be at the mercy of those who hate it. What value is it to regain energy independence?

Sincerely,

T. G. Lambert

TGL/gd

cc: NRC Contact File

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