8005190027 TIC

STONE & WEBSTER ENGINEERING CORPORATION

245 SUMMER STREET, BOSTON, MASSACHUSETTS

ADDRESS ALL CORRESPONDENCE TO P.O. BOX 2325, BOSTON, MASS. 02107

W.U. TELEX: 94-0001
94-0977

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DOCKET NUMBER
PROPOSED RULE PR Misc Notice
Reg Guide

April 8, 1980

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

Gentlemen:

We are pleased to submit our comments on Proposed Revision 2 to Regulatory Guide (RG) 1.94 "Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils and Foundations During the Construction Phase of Nuclear Power Plants," September 1979.

Since there are also some apparent differences between RG 1.94 and RG 1.10 "Mechanical (Cadweld) Splices in Reinforcing Bars of Category I Concrete Structures," Revision 1, January 1973, we have also addressed these differences in Attachement A to this letter.

Specific comments on RG 1.94 are as follows:

1a. ANSI N45.2.5 requires that Caldwelding be stopped if the tensile failure rate exceeds 1 in 15. It is impracticable to stop all Cadwelders when only one or two may have caused the criteria to be exceeded. We recommend that the licensee be permitted the flexibility to continue Cadwelding by those Cadwelders not responsible for the failing splices, except in those cases where the Cadwelding process and/or materials are suspect.

1b. The statistical approach being used (1 in 15 criteria) may be a problem. A more manageable position should be taken such that any failure-whether it is visual or tensile and whether it concerns requalification, stopping Cadwelding, or doing additional investigation/testing - should be cause to take a positive move, rather than wait for a second failure to occur and raise doubt about those splices done in the interim.

For this reason, we recommend the approach taken by ASME Section III - Division 2, which recommends immediate investigation/testing rather than waiting for the second failure to occur.

Ack by card 4/24/80

2. Under Part C, Regulatory Position, the opening paragraph appears to state that this document only applies when ASME Section III, Division 2, does not cover a particular topic. We recommend that this paragraph be clarified/revised to state that the provisions of ANSI N45.2.5 are applicable to those structures not covered by the American Society of Mechanical Engineers (ASME) Section III, Division 2.

3. In C1, it is unclear whether the NRC is objecting to an upper limit of "one-half hour" rather than an "average one-half hour" or to a total elapsed time of one-half hour from the mixing point up to the commencement of discharge.

   It is our interpretation that a total elapsed time of one hour is being allowed from the mixing point to the commencement of discharge.

4. Section C, Regulatory Position, Item 5, should be divided into two separate paragraphs. The first paragraph should address Subsection 7.4.2 only. The second paragraph should be numbered as Item 6 and should address the reference to Subsection 8.4.

5. The last sentence of Item 5 (which appears to apply to both Subsections 7.42 and 8.4) contains a conflict of terms; the word "should" should be changed to "shall."

6. The present Item 6 should be renumbered as Item 7.

7. The following general comment has a far-reaching significance to both the NRC and the ASME.

   Section 4.10 of ANSI N45.2.5-1974 stated that welding of reinforcing bar splices shall be subject to the provisions of Section 5.5, except that AWS D12.1 shall apply. Revision 1 to RG 1.94 (April 1976) paragraph C4 additionally required that "...the provisions of articles CC-4334 and CC-4330 of...(ASME, Section III, Division 2) for testing of welded reinforcing bar splices should be used as guidance pending endorsement of that code by the NRC staff."

   The proposed Revision 2 to RG 1.94 no longer addresses this matter, apparently because ANSI N45.2.5-1978, Section 6.13 has been revised. It now reads, "Welded reinforcing bar splices shall be subject to the requirements of Section 7.5 of this Standard except that provisions of Subsection CC-4334 of ASME Code Section III, Division 2 shall apply."

   The wording of Revision 1 to RG 1.94 invoked CC-4334 with regard to testing welded splices, whereas ANSI N45.2.5-1978 invokes all of CC-4334, which is a significant change. Because of the

new wording, certain aspects of CC-4334 appear to apply now which did not before. Some of the more significant of these are:

a. (CC-4334.1) Requirements for controlled chemistry reinforcing bars and a limitation on the maximum carbon equivalent in order to be able to weld reinforcing bars.

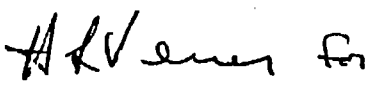
b. (CC-4334.2) The allowable end preparation for details of welded reinforcing joints restricts welding to only a few of the end preparation details that are allowed by AWS D12.1.

c. (CC-4334.6.1) Nondestructive examination (radiography) is required for welded reinforcing bar splices but is not required by AWS D12.1 unless specifically addressed in contract documents.

We do not believe that it was the intent of the NRC to adopt this section in its entirety. We recommend that RG 1.94 be reviewed to invoke only that portion of CC-4334, having to do with tensile testing.

Stone & Webster Engineering Corporation has taken certain exceptions to ANSI/ASME N45.2.5-1978. Since the RG endorses this Standard, we have enclosed, for your information, a copy of our letter to ASME, which explains these exceptions.

Very truly yours,



S. B. Jacobs
Chief Licensing Engineer

Enclosure

DWR:jmm

ATTACHMENT A

The following are comments on the apparent differences between Regulatory Guide (RG) 1.94 (Revision 2 proposed) and RG 1.10 (Revision 1):

1. There are differences between requirements of RG 1.10 "Mechanical (Cadweld) Splices in Reinforcing Bars of Category I Concrete Structures" and the portion of ANSI N45.2.5 endorsed by RG 1.94 (Revision 2 proposed) concerning Cadwelds, such as:

    a. ANSI N45.2.5 requires Cadwelder requalification for a change in bar size beyond one size up. It also requires original qualifications on the largest bar size to be used, which appears to conflict with the requalification requirements. Since RG 1.10 does not address requalification for a change in bar size, it is unclear whether a requalification is even necessary by RG 1.10.

    b. ANSI N45.2.5 does not list performance by a Cadwelder/crew as an essential variable in determining the separate test cycles, as RG 1.10 does.

2. In addition to the differences stated above, there are a number of aspects of ANSI N45.2.5 (and RG 1.10) which seem to be impractical and confusing. For quite some time, we have depended upon an interpretation of RG 1.10 made by the AEC (NRC) during a meeting held with Erico Products Inc. on May 8, 1973, (Attachment B). The interpretation itself does not provide enough clarification.

    Some of the items are as follows:

    a. The NRC has stated in its summary of the May 6, 1973, meeting that requalification could be based upon exceeding a tensile test failure rate of 1 in 15 (Item No. 6 of Attachment). for practical reasons, the rate of 1 in 15 must be applied to the total output of all Cadwelders rather than an individual, as approximately 750 production slices would be necessary to obtain 15 test splices from one individual (Item No. 15 of Attachment). Consequently, when two failures occur within 15 tests, requalification would be necessary. Using an example of two Cadwelders, A and B, assume that A fails a test and ten tests later (approximately 500 production splices worth) B's sample fails. Who should be requalified? If both should be, what effect if there upon those splices performed by A without requalification up until B's failure. If only B is to be requalified, it suggests that there is concern over the work of B, but not over that of A.

    b. When the rate of 1 in 15 is exceeded, the splices on either side of the last failed splice are tested.

However, the additional requirement to test four more, distributed throughout the balance of the 100 under investigation, is confusing. It is unclear whether the work of one Cadwelder is in question or whether a specific area of a structure may be deficient. This is further confused by the fact that the 100 splices referred to relates to the frequency of sampling and, by RG 1.10, is required to be based on each Cadwelder's work. It is possible that a group of 100 done by one individual may be spread out over a number of different areas of the same or different structures. Sampling any of these other areas would not provide significant data about a possible deficiency in a specific area. Sampling in the same general vicinity of the last failed splice may provide that information, but probably would be outside the scope covered by the 100 under investigation. Whichever question should be answered, the problem is further compounded by the fact that the work of the Cadwelder who performed the splice which failed first, or the adequacy of the area of the structure where the first failure occurred, is not pursued to the degree that the second failure is pursued.