



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 17 1982

Docket No. 50-444

MEMORANDUM FOR: T. T. Martin, Director, Division of Engineering and
Technical Programs, Region I

FROM: R. L. Baer, Chief, Engineering and Technical Support Branch,
DEQA, IE

SUBJECT: POSITION OF CADWELD SPLICE SAMPLING FOR CONTAINMENT DOME
AT SEABROOK STATION, UNIT 2

We have received comments on the draft position on the above subject which was circulated by a memo dated October 18, 1982, a copy of which was sent to you. The responses from NRR and RES are enclosed as Enclosures 1 and 2.

Enclosure 3 represents the original UE&C position. Since both NRR and RES endorsed the draft position, it now may be considered the NRC position statement on this subject for the Seabrook Unit 2 dome. This position is presented in Enclosure 4.

If there are any questions, please contact us.

Robert L. Baer

Robert L. Baer, Chief
Engineering and Technical Support Branch
Division of Engineering and
Quality Assurance
Office of Inspection and Enforcement

Enclosures:

1. Memo R. H. Vollmer to
E. L. Jordan dtd 11/2/82
2. Memo G. A. Arlotto to
E. L. Jordan dtd 11/9/82
3. Regulatory Guide 1.10 dtd 3/8/82
4. Position Statement dtd 11/15/82

cc: w/enclosures

F. P. Schauer, NRR
W. F. Anderson, RES

A. A. Varela, RI
A. C. Cerne, RI

E. L. Jordan, IE
J. M. Taylor, IE

CONTACT: R. E. Shewmaker, IE
49-27432

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IE ADOCK 05000444
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Enclosure 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 2 1982

*Rec'd
11/4/82*

MEMORANDUM FOR: Edward L. Jordan, Director
Division of Engineering and Quality Assurance, IE

FROM: Richard H. Vollmer, Director
Division of Engineering, NRR

SUBJECT: DRAFT POSITION ON CADWELD SPLICE SAMPLING FOR CONTAINMENT
DOME AT SEABROOK STATION UNIT 2

This is in response to your memo of October 18, 1982 on the above subject. We are in full agreement with your position (contained in Enclosure 3 of your October 18, 1982 memo) that the licensee should be allowed to proceed with a Cadweld sampling and testing program for curved bar splices in the dome using only sister splices. Our bases for agreement rests in the knowledge that the results of production tests for curved bar splices are very likely to be compromised by the fact that the bars are bent. The sister splices made on straight bars therefore provide more meaningful data and should be the standard by which the quality of the Cadweld process is judged.

We have reviewed the test data for the 9,102 Cadweld splices that were cited in your memo. We agree, based on this review, that reduction of the required test frequencies for production splices is appropriate in light of the excellent record to date. We are concerned, however, that total elimination of production splice testing may not be prudent. Since a number of groups within the NRC, and possibly the nuclear industry, could provide input to resolve this matter we recommend that further discussions be initiated to allow an exchange of ideas regarding future Cadweld test programs. We will be happy to participate in these discussions; Dr. John S. Ma from the Structural Engineering Branch will be the DE contact for this matter.

Richard H. Vollmer, Director
Division of Engineering, NRR

cc: R. L. Baer, IE
R. E. Shewmaker, IE
G. A. Arlotto, RES
W. F. Anderson, RES
F. J. Miraglia, DL
L. L. Wheeler, DL
J. P. Knight, DE
F. P. Schauer, DE
D. C. Jeng, DE
J. S. Ma, DE

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 9 1982

*Rec'd
11/04/82*

MEMORANDUM FOR: E. L. Jordan, Director
Division of Engineering and Quality Assurance, IE

FROM: G. A. Arlotto, Director
Division of Engineering Technology, RES

SUBJECT: DRAFT POSITION ON CADWELD SPLICE SAMPLING FOR CONTAINMENT DOME AT SEABROOK STATION UNIT 2

Your October 18, 1982 memo has been reviewed and comments provided by G. Arndt to R. Shewmaker on October 20, 1982, as requested. They are:

1. We support your draft recommendation as stated in Enclosure 3 to your memorandum. The variety of radii in the dome bars and the complexity of their placement makes it reasonable to permit sister splices for all dome test samples, even though some of these bars may have a radius of curvature large enough to permit testing production splices. However, this should not set a precedent to be applied below the springline to the containment wall cylinder and its horizontal hoop bars, even though their radius of curvature may approximate that of some of the dome bars.
2. We would like to study further the suggestion that production splices be dropped altogether for this splice system. It is a topic independent of the Seabrook 2 topic and needs a determination, based on a review of field data, of how critical or noncritical is workmanship in the performance of this splice system. We recommend IE, NRR, and RES discuss this in the near future. Gunter Arndt has already told Bob Shewmaker that we will participate whenever IE calls such a meeting.

Guy A. Arlotto
Guy A. Arlotto, Director
Division of Engineering Technology
Office of Nuclear Regulatory Research

cc: R. Shewmaker
F. Schauer

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CF

3/8/82

Regulatory Guide 1.10
UE&C Position on Regulatory Positions 3 & 4

1. Regulatory Position 3 states ... "production splice samples should not be removed from curved reinforcing bars for tensile testing". UE&C concurs and has used sister splices for all curved reinforcing bars.
2. When complying with R.P.3 it is not possible to comply with R.P.4b which is referenced in R.P.3. Since separate test cycles must be established for horizontal, vertical and diagonal bars it is not possible to establish a test frequency which combines production and sister splices for a bar position such as horizontal where all bars are curved and all sister splices are tested.
of RS 1.10
3. UE&C does not utilize position 4b since we do not combine sister and production splices. When production splices can be tested we test all production splices.
4. In recognition that no testing frequency is provided in the Regulatory Guide for the situation where all sister splices are tested we have opted to use the more frequent testing specified in 4b for this case. This is supported by our interpretation of ASME Section III Div. 2 which provides a third category of all sister splices in CC4333.4.3(c) although a testing frequency is also not provided.
5. This position is supported by ANSI N45.2.5 Section 6.12.3 which is endorsed by the NRC in Regulatory Guide 1.94. It states that when sister splices are used for curved bars the combined sister - production frequency shall be used but all sister splices can be tested.
6. The requirement in 4b that "At least one-fourth of the total number of splices tested should be production splices", also is not possible to satisfy when a test cycle has all sister splices. We have however included a requirement in the Contractor's procedures that at least one-fourth of the splices in the structure will be production tested. This could obviously result in a crew which does not have production testing performed on its work. This is unavoidable, particularly for new crews formed since work started on the curved dome rebar.

B. B. Scott

B. B. Scott

BES/ba

P.S. If this position is acceptable to the NRC we should modify FSAR to take exception to R.G.1.10.

cc: BB Scott - 1404
 DE McGarrigle - 1406
 AJ Eulshizer/KM Kalewadia - 0604
 J. Cannon - 1403
 DC Lambert - Site

Position Statement (11/15/82)
For Seabrook, Unit 2 Dome

1. It is acceptable for all splices completed on curved reinforcing steel to be sampled on only sister splices. These are to be made and tested on the following frequency as derived from RG. 1.10, C.4.b.:
 - 1 sister splice for the first 10 production splices
 - 4 sister splices for the next 90 production splices
 - 3 sister splices for the next and subsequent units of 100 production splices
2. Since the sister splices are to be made by crews in the same position, on the same bar size and adjacent to the production splice they represent, separate test cycles are to be established for meridional, hoop and apex bars for each bar size and crew.
3. If the rate of test splices that fail the tensile tests exceeds one in fifteen consecutive test splices, mechanical splicing shall be terminated and the cause of the failures determined and corrected before resuming work. The sampling procedure and frequency shall start anew.