TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

79 JUL 17 A8:17 July 12, 1979

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Goergia 30303

Dear Mr. O'Reilly:

YELLOW CREEK NUCLEAR PLANT UNIT 1 INFRACTION 50-566/79-09-03, CONCRETE ACTIVITIES, AND INFRACTION 50-566/79-09-04, BULKWELD POWDERED METAL CHEMICAL ANALYSIS

This is in response to C. E. Murphy's letter dated June 20, 1979, RII:MJG 50-566/79-09, 50-567/79-09, concerning activities at the Yellow Creek Nuclear Plant which appeared to have been in violation of NRC regulations. Enclosed is our response to the citations.

If you have any questions concerning this matter, please get in touch with D. L. Lambert at FTS 854-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L M Mills by mfd

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosures
cc: Mr. Victor Stello, Jr., Director (Enclosures)
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ENCLOSURE

YELLOW CREEK NUCLEAR PLANT UNIT 1

INFRACTION 79-09-03

CONCRETE ACTIVITIES

Infraction

566/79-09-03

As required by Criterion V of Appendix B to 10 CFR 50, and as implemented by TVA Topical Report TVA-TR75-1A, Section 17.1A.5, "Activities affecting quality shall be prescribed by documented instructions, procedures or drawings . . . and shall be accomplished in accordance with these instructions, procedures or drawings." Quality Control Instruction QCI C-208 specifies requirements for obtaining and documenting concrete samples, and specifies actions to be taken for out of specification test results. QCI C-208, Appendix 4, states that concrete compressive test cylinders shall be removed from the molds at 16 to 24 hours after molding and shall have free water maintained on the entire surface area of the cylinder at all times. QCI C-201 requires vertical insertion of vibrators a sufficient distance into concrete to ensure consolidation of successive layers and requires deposition of concrete in a manner that will not result in concrete flow for any distance.

Contrary to the above:

1. A concrete sample for Category 1 pour A1-D4 was discarded because measured slump was out of specification on June 5, 1979.

2. Several cylinders in the moist curing room were surface dry on June 5, 1979.

3. The mold for cylinder 684 was removed 29 hours after molding.

4. Vibrators were inserted into the top layer of pour A1-D4 at acute angles and failed to penetrate to the previous layer.

5. Concrete was deposited in one large pile from the bucket on several occasions during pour A1-D4 and allowed to flow excessive horizontal distances (6-8 feet).

Assessment of Infraction

Because of the following reasons, it is TVA's opinion that TVA was in compliance with QCI C-201 for item 5.

TVA certified concrete inspectors continually monitor each pour and are trained to recognize segregation due to excessive concrete movement and take corrective action.

In determining excessive movement of concrete, the segregation of the aggregate and mortar is the major controlling factor, and is dependent upon the slump of the concrete. Low slump concrete can and must be worked (moved) more than higher slump concrete. The concrete cited in this deficiency had a slump maximum of 2-1/2 inches and would require more movement than higher slump concrete. It is impracticable to place a quantitative value on the amount of movement.

Further, the concrete for this pour was placed in 2-cubic yard increments with an average lift thickness of 15 inches. After depositing, the pile is leveled to the lift height and then consolidated. Two cubic yards of concrete would therefore cover an area with a 3.7 foot radius.

Corrective Steps Which Have Been Taken and Results Achieved

1. Out-of-specification samples have been handled and will continue to be handled in accordance with QCI C-208 section 3-A. This procedure specifies that if more than one of ten samples are out of specification, inspectors will notify the materials engineer for corective action and, if necessary, initiate a QCIR.

   The practice of discarding out-of-specification samples from wasted batches was discontinued immediately upon notification by the NRC inspector of his concern.

2. The moist curing room has been maintained at a relative humidity of over 95 percent. The dry cylinders discovered by the NRC inspectors were a direct result of clogged fog nozzles. These nozzles were cleaned and the dry cylinder conditions eliminated on June 9, 1979.

   The detrimental effects of dry cylinders lowers the concrete's compressive strength. The compressive strengths of all concrete cylinders are checked either at 28 days or at 90 days and must meet the design strengths in accordance with TVA General Specification G-2. QCIR 12165 has been written and dispositioned by the materials engineer covering the dry cylinders.

3. Concrete cylinders are normally molded throughout the second shift and stripped on the following day at the beginning of the second shift. This provides the proper time interval of 16 to 24 hours of set before stripping. Concrete cylinders 684 were molded on the first shift for turbine building concrete and stripped on the following day at the beginning of the second shift. This resulted in a setting time of approximately 28 hours instead of 24 hours as required by QCI C-208.

   The concrete represented by these cylinders was nonsafety-related concrete for the turbine building caisson.

4. QCIR 12164 and NCR 014 were initiated for pour A1-D4 and sent to Engineering Design for disposition.

5. None.

Corrective Steps Which Have Been Taken To Avoid Further Noncompliance

1. The Supervisor, Quality Control-Materials and Civil Unit, immediately instructed concrete employees orally and by memorandum to retain all sample data.

2. An additional line of fog nozzles is being installed to preclude future problems and is expected to be completed by July 15, 1979. In the interim, surveillance has been increased to ensure compliance with QCI C-208.

3. First shift concrete inspectors have been instructed by the materials engineer to strip any concrete cylinders molded by them at the beginning of the first shift on the following day. This should preclude any discrepancy with safety-related concrete that may be poured on the first shift.

4. Concrete inspection employees have been instructed verbally and by memorandum by the Supervisor, Quality Control-Materials and Civil Unit, regarding the correct use of concrete vibrators and their responsibilities to ensure craft compliance with QCI C-201, Appendix 4, Section 11 2. Additionally, craft supervisor employees were instructed regarding the importance of proper concrete vibration.

5. None.

Date When Full Compliance Will Be Achieved

1. TVA was in full compliance with QCI C-208 on June 7, 1979.

2. TVA was in full compliance with QCI C-208 on June 9, 1979.

3. TVA was in full compliance with QCI C-208 on June 9, 1979.

4. TVA was in full compliance with QCI C-201 on June 7, 1979.

5. TVA has been in compliance with QCI C-201.

YELLOW CREEK NUCLEAR PLANT UNIT 1

INFRACTION 79-09-04

BULKWELD POWDERED METAL CHEMICAL ANALYSIS

Infraction

566/79-09-04

As required by Criterion V of Appendix B to 10 CFR 50, and as implemented by TVA Topical Report TVA-TR75-1A, Section 17.2A.5, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings . . . and shall be accomplished in accordance with these instructions, procedures or drawings."

Chicago Bridge and Iron Company procedure WMS 479, Revision 0, part 4, states, "The chemical analysis of the powdered metal shall conform to AWS classification EH-14 in SFA 5.17 of Section II, Part C, Table 1 of the ASME code and the special requirements of this section."

Contrary to the above, the certified material test report for bulkweld powdered metal heat number 0479008 indicated a chemical analysis had only been conducted for three of the six required elements listed in Table 1 of SFA 5.17, Section II, Part C of the 1974 ASME code. The bulkweld powdered metal had been used in the submerged arc welding of Unit 1 containment vessel plates.

Corrective Action Taken and Results Achieved

Chicago Bridge and Iron Company (CB&I) contacted the bulkhead powder metal supplier, Tapco, concerning the certified material test report for heat number 0479008. A revised CTR, showing the material meets the required specifications, for the concentration of all six elements as required by SFA 5.17 of Section II, Part C, ASME code was sent to CB&I.

Steps Taken to Avoid Further Recurrence

CB&I's QA staff has been alerted to the requirements of the ASME code concerning the CTR.

Date of Full Compliance

A copy of the revised CTR was available on site on June 18, 1979.