



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 191 MARIETTA ST., N.W., SUITE 3100
 ATLANTA, GEORGIA 30303

Report Nos. 50-566/80-17 and 50-567/80-17

Licensee: Tennessee Valley Authority
 500A Chestnut Street
 Chattanooga, TN 37401

Facility Name: Yellow Creek

Docket Nos. 50-566 and 50-567

Licensee Nos. CPPR-172 and CPPR-173

Inspection at Combustion Engineering Inc. Plant Chattanooga, Tennessee

Inspectors:

L. D. Zajac

11/24/80
Date Signed

J. D. Coley

11-24-80
Date Signed

Approved by:

A. R. Herdt
A. R. Herdt, Section Chief, RC&ES Branch

11/24/80
Date Signed

SUMMARY

Inspection on October 15-17, 1980

Areas Inspected

This routine, announced inspection involved 48 inspector-hours on site in the areas of Preservice inspection of reactor vessel; followup on inspector identified items concerning responsibilities for preservice inspection; review of radiographic films of safety related piping and components.

Results

Of the three areas inspected, no items of noncompliance or deviation were identified in two areas; one item, a previous unresolved item, was upgraded to a noncompliance (Deficiency - Failure to establish responsibilities in PSI when inspections are conducted in vendor shops - paragraph 3).

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DETAILS

1. Persons Contacted

Licensee Employees

- *W. E. Andrews, Chief QA Staff, Nuclear Power
- *R. H. Daniel, Supervisor Baseline & ISI
- *M. E. Gothard, Mechanical Engineer

Other Organizations

- *R. A. Hillis, Lead Quality Engineer, Combustion Engineering, Inc.
- *N. R. Bentley, Quality Engineer, Combustion Engineering, Inc.
G. R. Perkins, Supervisor Inservice Inspection, Combustion Engineering, Inc.
- *J. J. Dore, Project Engineer, ISI, Combustion Engineering, Inc.
- *G. V. Papalexiou, Mgr, Automated Exams, Nuclear Energy Services
- *G. D. Martens, Ultrasonic Examiner Level III, Nuclear Energy Services

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on October 17, 1980 with those persons indicated in Paragraph 1 above. The unresolved item and the three inspector follow up items were discussed in detail. Subsequent to the inspection, the licensee was informed that a previous unresolved item noted in paragraph 3 below was elevated to an item of noncompliance. This information was transmitted to the licensee by telephone on October 20, 1980.

3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item No. 50-566; 567/80-05-01 Responsibilities for PSI. On March 5, 1980, NRC identified that TVA's Operational QA Manual did not clearly define activities such as procedure approval, program surveillance, and final report review for PSI work performed in the vendor shops. The Division of Power Production had recently reorganized and the operational QA manual was in the process of being completely revised to cover the new organization. The Supervisor of the Preservice (PSI) and Inservice Inspection Section however, agreed to issue an interim change to the existing operation QA manual to more clearly define the Section activities relative to vendor shop PSI work until the revised QA manual could be issued. During this inspection the inspectors found that an interim change had not been issued as agreed on March 5, 1980. In addition the revision of TVA's operational QA manual which was to incorporate the changes for PSI work performed in the vendor shops was still in the draft stage and as written fails to adequately address NRC's previously reported concern. Failure to clearly establish and delineate in writing the duties of persons and organizations performing activities affecting the safety related function of structures, systems and components is in noncompliance with 10

CFR 50 Appendix B Criterion I and will be identified as deficiency no. 566/80-17-01 and 567/80-17-05, "Failure to Establish Responsibilities for PSI when inspections are conducted in vendor shops."

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in paragraph 8.

5. Inspector Follow-up Item

(Closed) Inspector follow-up Item 566, 567/80-02-01: "Use of Appendix I to Section XI for Piping Inspection".

This item concerns the licensee's contractor use of Appendix I to ASME Section XI 1974 Edition through S/75 addenda for piping inspections in lieu of Section V 1974 Edition through S/75 addenda as required by Section XI. The requirements of Section V appeared to be exceeded when using Appendix I, however, Combustion Engineering (CE) agreed to evaluate the pipe inspection procedure to ensure that all requirements of Section V were included. Combustion Engineering Shop Pre-Service Inspection Program Plan for TVA Yellow Creek Units 1 and 2, Document No. TR-ESS-071 Revision 2 Section VI, "Exclusion and Exceptions", addressed this concern in detail. A review of this revision disclosed that the original concerns were covered.

There were no discrepancies were noted by the inspectors and this item is consider closed.

6. Independent Inspection Effort

The inspectors reviewed radiographic films of several welds, of the reactor vessel and safety related piping, identified below, to ascertain whether code requirements were being met. The applicable code for this activity is ASME Boiler & Pressure Vessel Code Section V, 1974 with addenda through summer 1975.

<u>Weld Identification</u>	<u>Drawing No.</u>	<u>Component</u>
101-121	E75174-121-001	Reactor Vessel shell girth weld
101-642B	E75374-642-001	Pressurizer shell long seam
101-124C	E-124-001	Reactor vessel long seam
201-128B	D-128-002 & C-131-001	Reactor vessel nozzle safe end
101-171	E75174-171-001	Reactor vessel girth weld
209-742A	742-210-3	Reactor coolant pipe long seam
209-742B	7422103	Reactor coolant pipe long seam
101-758	758-113	Reactor coolant pipe girth

202-741	741-201	seam Reactor coolant pipe nozzle girth seam
108-711	711-103-4	Reactor coolant pipe nozzle seam
203-742A	742-203-2	Reactor coolant pipe long seam
203-742B	742-203-2	Reactor coolant pipe long seam

The following discrepancies were noted:

- a. The radiographic films for weld 101-642B show a base metal indication 1/2-inch wide by 2 1/4-inches long on view (5-6). The radiographic reader sheet indicates that this is an acceptable surface indication. The adjacent view (6-7), which had a weld repair, overlaps area (5-6). However, the surface indication does not show on the (6-7) view, thus indicating that the wrong weld or the wrong area was radiographed after weld repair. Investigation of this apparent discrepancy disclosed that the (5-6) view was radiographed prior to clad welding of the vessel, while the (6-7) view was radiographed after clad welding, thus the surface indication would no longer exist at the time view (6-7), after repair, was made.

The inspectors suggested that reader sheets reflect this type of information when questionable conditions similar to the above exist.

- b. The radiographic films for nozzle weld 108-711 showed a 3/16-inch weld spatter or arc strike indication on the base metal about 1 1/2 inches from the weld which was not reported on the reader sheet. The inspectors were advised that indications of that type are not reported unless they are in the weld area. The inspectors were also advised that this type of indication is evaluated and resolved during other inspections, such as visual, liquid penetrant or magnetic particle.

The inspectors suggested that the examination program be reviewed to ensure that base metal indications disclosed by radiography, not only weld spatter or arc strikes but other indications that may go undetected by other examinations, are not overlooked

- c. One set of radiographic films for pipe weld 101-758 showed the penetrometer in the weld of each exposure, while a second set of radiographs showed the penetrometer on the base metal, but positioned on such a thick area that the film density difference between the penetrometer and the weld area was greater than 30%, thus violating code requirements. In this case the reader sheet indicated that only one set of radiographs were evaluated. Therefore, it can be assumed that the radiographs containing the penetrometer in the weld area were rejected and the weld re-radiographed, and since the second set of radiographs violate code, it would appear that both sets should have been rejected.

During discussion with the film reader, the inspectors were advised that both sets of radiographs were used to evaluate the weld. The inspectors agreed that by using both sets, the radiographs meet code requirements. However, the reader sheet did not indicate both sets were evaluated.

The inspectors suggested that an explanation of unusual circumstances, as described above, should be noted on the reader sheet, such that the official record "stands on it's own".

- d. In view of the above described discrepancies, it is recommended that the radiographic film review program be reviewed and corrective measures be established to preclude similar potential problem areas. This will be carried as Inspector Followup Item 567/80-17-04 "Confusing Radiographic Interpretation Records".

Within the areas examined, no items of noncompliance or deviations were noted.

7. Preservice Inspection - Observation of Ultrasonic Examination

- a. The inspectors observed ultrasonic examination of reactor vessel shell welds and reactor vessel head welds, as identified below, to ascertain whether examinations were being performed in accordance with code requirements and applicable licensee written procedures. The applicable code is the same as stated in paragraph 6.

<u>Weld Identification</u>	<u>Component</u>
02-002-002	Reactor vessel head circumferential weld, (inside surface only)
02-002-003	Reactor Vessel Head diametrical weld, (inside surface only)
02-001-019	Reactor Vessel nozzle to shell weld
02-001-007	Reactor Vessel intermediate longitudinal shell weld
02-001-011	Reactor Vessel upper shell longitudinal weld
02-001-010	Reactor Vessel upper shell to intermediate circumferential weld

The inspectors observed both manual and automatic ultrasonic examinations (UT) which included a review of the following:

- (1) type of apparatus used
- (2) extent of coverage
- (3) calibration methods
- (4) size and frequency of search units
- (5) reference level for monitoring discontinuities
- (6) methods of demonstrating penetration

- (7) levels for evaluating and recording indications
- (8) type of couplant used
- (9) In addition, for the automatic ultrasonic examination the following was inspected
 - (a) whether the instruction manual and/or written procedure was being followed.
 - (b) whether the examination personnel were familiar with system, application operation and limitations.
 - (c) whether the test examination did permit continuous observation of scanning pattern.
 - (d) whether there was continuous recording of meaningful and reproducible data with accurate reference points.
 - (e) whether initial unit calibration and subsequent calibrations were done per procedure.

b. The following discrepancies were noted:

- (1) During manual UT of the RV head diametrical weld, 02-002-003, weld spatter on the scanning surface prevented examination of a part of the weld. As this occurred near the end of the day, the inspectors departed without witnessing the resolution to this problem. The next morning the inspectors discovered that the longitudinal examination of the subject weld had been completed and the circumferential weld was being examined. However, the inspectors noted that the weld spatter had not been removed, which is required by the applicable procedure (NIP 1138). This was pointed out to the Inservice Inspection Supervisor who in turn initiated action to have the weld spatter removed and the area ultrasonically examined by the longitudinal method. It should be noted that even though the weld spatter (one piece) was not removed originally, the shear wave method of UT would have adequately scanned the weld volume beneath the weld spatter. However, in spite of this fact, the weld spatter should have been removed to permit adequate examination using the longitudinal method of UT and to comply with the licensee's procedure.

The inspectors consider that this discrepancy may be indicative of other examinations where weld spatter is not removed. Therefore, it was requested that the surface preparation requirements be reviewed to ensure the examiners are aware of these requirements and the actions they should take to ensure surfaces are satisfactory for examinations. This will be an Inspector Follow-up Item No. 567/80-17-03, "Removal of Weld Spatter on Surfaces to be Ultrasonically Examined".

- (2) The inspector observed an examiner performing the straight beam inspection for the reactor vessel head circumferential weld from the internal surface in the area of the forged bolting ring

flange. The purpose of this required inspection outside the Weld Required Volume (WRV) is to evaluate the base material discontinuities that will interfere with the angle beam inspection of the weld. The inspectors noted that the equipment (scope) was not calibrated with a back surface in accordance with Nuclear Energy Service (NES) procedure NIP 1138 for inspections performed in this area. Discussions with the examiner and with Combustion Engineering supervisor for inservice inspection revealed that the more critical straight beam calibration utilizing the side drilled holes on the WRV calibration block for back reflection was used because of the geometry of the flange. The inspectors were concerned that NES Procedure NIP-1138 that had been written specifically for the UT examination of the RPV closure head diametral and circumferential dome to flange welds did not address NES actual practice for conducting examinations in this area. Combustion Engineering Supervisor for Inservice Inspection issued Engineering Change Notice No. TVA 2-5 to revise paragraph 8.1 and paragraph 10.1.2 of NES procedure NIP-1138 Rev. 4 to reflect how examinations would be performed when no observable back reflection exist due to component geometry. NES Procedure NIP-1138 will be examined at a future inspection to ensure distribution of this change. This is identified as inspector follow-up item number 567/80-17-01.

Within the areas examined, no items of noncompliance or deviations were identified.

8. Preservice Inspection - Review of Personnel Qualification Records

The inspectors reviewed the ultrasonic examiner's qualification records to ascertain whether they met the applicable code requirements. The applicable code requirements are the same as indicated in paragraph 6. The qualification records reviewed were those for the ultrasonic examiners performing the automatic ultrasonic examination on the reactor vessel welds and also for those doing manual ultrasonic examination on the reactor vessel head welds. The records indicated that these individuals were qualified level I and II ultrasonic examiners, but there was no evidence that they had been trained/indoctrinated on the ultrasonic procedures being used. It should be noted that the UT examiners are employed by Nuclear Energy Services (NES). When NES was asked for verification that the UT examiners had been trained/indoctrinated on the applicable procedures, a letter was forwarded a couple days later from their main office which was to provide verification. However, this letter was merely a general statement that UT examiners receive training on the use of the automatic UT equipment in accordance with the applicable procedure. The letter did not state that the specific individuals performing the examinations were trained/indoctrinated.

The inspectors related the following requirements concerning this subject:

- a. Paragraph IWA-2300 of Section XI of ASME specifies the qualification requirements for NDE personnel. In part it states, "The practical portion of SNT-TC-1A shall be performed using the Owner's procedure(s) on part(s) representative of the Owner's Plant". For example, UT procedure NIP 1130 for automatic examination would apply which has been approved for use by the Owner.
- b. Paragraph 9.6.1 of SNT-TC-1A indicates that personnel records of certified individuals should include several items as a minimum; one being a statement indicating satisfactory completion of training in accordance with the employer's written procedure (e.g. NIP 1130), as specified in paragraph 9.6.1.d.
- c. The licensee should review the personnel records and ensure they adequately support the qualifications of individuals performing ultrasonic examinations on the reactor vessel.

This is Unresolved Item No. 567/80-17-02 "Lack of Documentation for Personnel Qualifications to Procedures being used".

Within the areas examined, no items of noncompliance or deviations were identified.