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

Report No. 50-395/81-17

Licensee: South Carolina Electric and Gas Company
Columbia, South Carolina 29218

Facility Name: Summer

Docket No. 50-395

License No. CPPR-94

Inspection at Summer Site near Columbia, South Carolina

Inspectors: James L. Coley Jr. — 8-10-81
J. L. Coley — Date Signed

E. H. Girard — 8/10/81
E. H. Girard — Date Signed

Approved by: A R Herdt — 8/11/81
A. R. Herdt, Section Chief — Date Signed
Engineering Inspection Branch
Engineering and Technical Inspection Division

SUMMARY

Inspection on July 13-17, 1981

Areas Inspected

This routine, unannounced inspection involved 64 inspector-hours onsite in the areas of preservice inspection - audit of work and work activities by reverification inspection and preservice inspection - data review.

Results

Of the 2 areas inspected, no violations or deviations were identified in one area; one violation was found in one area (Violation - Failure to follow ultrasonic inspection procedure for baseline inspection, paragraph 4.a).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*O. S. Bradham, Station Manager
*D. R. Moore, Quality Assurance Manager
*L. B. Collier, Welding Supervisor
*T. A. McAlister, Q.A. Surveillance Specialist
*S. J. Smith, Maintenance Supervisor
*S. S. Howze, Licensing
*C. C. Turkett, QC Supervisor
*A. R. Caban, Q. C. Inspector

Other Organizations

*M. A. Derylak, Project Q.A. Engineer, Daniel Construction Company
*J. R. Fletcher, Project Quality Manager, Daniel Construction Company

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 17, 1981 with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below:

(Open) Violation 50-395/81-17-01: Failure to follow ultrasonic inspection procedure for baseline inspection, paragraph 4a.

(Open) Unresolved Item 50-395/81-17-02: Inspection of weld root with 41° refracted longitudinal (R.L.) wave transducer, paragraph 4b.

(Open) Inspector Follow-up Item 50-395/81-17-03: Ultrasonic inspection reporting inconsistencies, paragraph 5a.

3. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph 4.b.

4. Preservice Inspection - Audit of Work and Work Activities by Reverification Inspection

   a. The inspectors selected the following Class 1 and Class 2 pipe weld joints for inspection reverification. This reverification was accomplished with Region II ultrasonic (UT) equipment and personnel. The applicable code for the preservice inspection is the ASME Boiler and Pressure Vessel Code Section XI and Section V, 1974 Edition with Addenda thru Summer 1975. Reflectors used for calibration in each of the following pipe weld joint examinations, with the exception of the two weld joints in the centrifugal cast stainless steel reactor coolant loop, were 10% notches. Reflectors for the centrifugal cast stainless steel reactor coolant loop calibration were 3/16 inch diameter side drilled holes.

ISOMETRIC DWG	SYSTEM & WELD JOINT NO.	SIZE	SCAN PERFORMED	COMMENTS
CGE-2-2103	Feedwater #121	18" X 1.100"	Partial 2,5,7,8	Paint not removed within Angle Beam Scan Distance
CGE-2-2304	Feedwater #4	18" X 1.156"	Partial 2	(1) Paint not remove within Angle Beam Scan distance. (2) UT Record has Datum Point reversed. Report indicates scan 5 was performed.
CGE-1-4100	Reactor Coolant #5DM	33.7" X 2.35"	Partial 5, ID Root not Inspected with 45° R.L. wave	Transition weld, I.D. Root not inspected with 45° R.L. wave
CGE-1-4100	Reactor Coolant #4	33.7" X 2.35"	5 Complete, Partial 7 and 8	ID Root not Inspected with 45° R.L. wave

CGE-1-4101	Safety Injection #1	12" X 1.125"	Partial 5	Hanger removed for inspection
CGE-1-4101	Safety Injection #2	12" X 1.125"	Partial 5, 2 Complete	Hanger removed for inspection
CGE-1-4102	Residual Heat Removal #8	12" X 1.015"	2 Complete	Hanger removed for inspection
CGE-1-4102	Residual Heat Removal #7	12" X 1.015"	5 Complete	---
CGE-1-4103	Safety Injection #6	6" X .719"	5 Complete	---
CGE-1-4501	Reactor Coolant #DM-1	6" X .719"	Partial 2	Report indicated flange as limitation, bevel on nozzle is actual limitation
CGE-1-4501	Reactor Coolant #2	6" X .719"	2 Complete	Same as above

The inspectors performed all angle beam examinations with 45 degree transducers. Westinghouse inspection procedure ISI-205 Rev. 2 was used for the above inspection. The inspectors noted that Westinghouse procedure ISI-205 Rev. 2 Figure 7 required a minimum angle beam scan length of 4 inches when full node 45 degree examinations were performed on material ranging in thickness from 1 inch to 1.2 inch. The surface area that would be required to be cleaned in order that a transducer wedge could achieve a minimum 4 inch scan length would be approximately 5 inches. In addition to the above scan length requirement, Westinghouse procedure ISI-205 paragraph 3.7 required the surface finish on the calibration blocks to be representative of the examination area (no paint); and paragraph 2.4 required that the area contacted by the transducer be checked to ensure that foreign matter that could impair the free movement of the transducer or effect the examination was removed prior to the examination. Contrary to the above, the inspectors noted that both weld joints selected for

reinspection in the 18 inch carbon steel feed water system (Isometric CGE-2-2103 joint #121 and Isometric CGE-2-2304 joint #FW-4) had not had the paint removed from the pipe for the required minimum scan length. This failure to properly prepare the examination surface and to conduct the ultrasonic examination in accordance with an approved procedure resulted in an inadequate inspection of the weld and the heat affected zone. The area that did not receive an adequate inspection by the examiners represented 65% of weld joint #FW-4 (3:00 to 11:00), which had a clean scan distance ranging from a minimum of 2 7/8 inches to a maximum of 3 1/4 inches. The area that did not receive full inspection on weld joint #FW-121 represented approximately 45% of the weld joint (3:00 to 9:00), the scan distance clean in this area ranged from 3 1/8 inches to 3 3/4 inches.

Painted surface conditions that made total UT coverage of the welded joints impossible were verified by South Carolina Electric and Gas Company personnel cognizant of preservice inspection. Failure to follow procedure is a violation of 10 CFR 50 Appendix B Criterion V and was reported to the licensee as Violation Number 50-395/81-17-01, Failure to follow UT procedure for baseline inspection.

b. The inspectors noted that when 45 degree refracted longitudal wave transducers were used for calibration on the licensee's reactor coolant (centrifugal cast stainless steel) calibration block the side drilled holes were readily discernible, but that a representative signal could not be obtained from the corner of the block. It was apparent to the inspectors that corner defects such as cracks propagating from the I.D. of the pipe may not have been identified or properly characterized by the licensee if a 45 degree refracted longitudal wave transducer was utilized. Failure of the refracted longitudal wave to discern properly the corner of the calibration block was due to mode conversion. The larger compressional wave signal was converted to a shear wave and attentuated into the grain structure of the cast stainless. The mode conversion left a smaller longitudal wave reduced to the point that it was also attentuated into the pipe grain structure. The licensee however had used a 41 degree refracted longitudal wave transducer in lieu of a 45 degree used by the inspectors. The licensee's transducer was not at the site so the inspectors could not evaluate the licensee's technique for inspection of defects propagating from the weld I.D. However, Westinghouse's Level III examiner stated per telcon that corner defects starting on the weld ID would have been detected and evaluated when a 41 degree transducer was used.

The inspector informed the licensee that a demonstration would be necessary to prove that the licensee's 41 degree refracted angle longitudal wave transducer actually inspected the root of the reactor coolant system welds and that a corner defect such as a crack could be observed and characterized. The licensee agreed to provide such a demonstration. This item was reported to the licensee as Unresolved Item 50-395/81-17-02, Inspection of weld root with 41 degree refracted longitudal wave transducer.

Within the area examined, no violations or deviations were identified except as reported in paragraph 4.a above.

5. Preservice Inspection - Data Review

a. The inspectors reviewed the preservice inspection records for the welds listed in 4a above. The applicable code for this review is also delineated in paragraph 4a above. The records were reviewed to determine whether they contain or provide reference to (where applicable):

- Examination results and data sheets
- Examination equipment data
- Calibration data
- Records on extent of examination
- Inspection limitations
- Evaluation of examination data performed by a Level II or Level III examiner.
- Evaluation of examination data complies with the procedure.

In reviewing the records for attributes as described above the inspectors found the following errors in ultrasonic reporting data.

(1) Isometric No. CGE-2-2304 weld joint #FW-4 had recorded that scan 2 had not been performed and that scan 5 had received a partial inspection, however, the reverse was true.

(2) Isometric No. CGE-1-4501 weld joint #2 had reported a limitation for the 5 scan as a flange. The limitation was actually a bevel on the nozzle for the pressurizer.

The licensee is presently reviewing the preservice records and comparing the actual records to the weld joint configurations. Reporting errors as identified above should be corrected as a result of this review. A review to assure that records accurately reflect inspections performed and conditions that are reported as limitations will be performed in subsequent inspections. This item was reported to the licensee as inspector followup item 50-395/81-17-03, UT reporting inconsistencies.