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

Report No. 50-395/82-13

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: J. L. Coley — 2-18-82 Date Signed

for B. R. Crowley — 2/18/82 Date Signed

E. H. Girard — 2/18/82 Date Signed

Approved by: for A. R. Herdt, Section Chief — 2/18/82 Date Signed
Engineering Inspection Branch
Engineering and Technical Inspection Division

SUMMARY

Inspection on January 26-29, 1982

Areas Inspected

This routine, announced inspection involved 73 inspector-hours on site in the areas of licensee action on previous inspection findings, licensee identified items (50.55(e)), inspector follow-up items, preservice inspection, review of as-builts, reactor coolant pressure boundary piping and IE Information Notices.

Results

No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*W. A. Williams, General Manager, Nuclear Operations
*O. Bradham, Plant Manager
*D. R. Moore, Manager, Quality Assurance
*S. S. Howze, Engineer, Nuclear Licensing
*J. Connelly, Deputy Plant Manager
*P. Fant, Director, Station Quality Control
*H. I. Donnelly, ISEG Engineer
*M. W. Clonts, QC Manager
K. W. Nettles, Senior Engineer - Production Engineering
*J. W. Parks, Technical Specialist
J. Radin, Director of Project Engineering
C. Turkett, Quality Control Group Leader
*T. A. McAlister, QA Surveillance Specialist
F. McKennon, Quality Control Group Leader
*L. B. Collier, Welding Supervisor
A. G. Alvarez, Senior Engineer

Other Organizations

G. Hughes, Metallurgist, Westinghouse Electric Corporation
D. G. Wieland, Site Service Manager, Westinghouse Electric Corporation
R. A. Stought, Site Service Manager, Westinghouse Electric Corporation
W. Remkus, Engineer, Westinghouse Electric Corporation
*J. R. Fletcher, Project Quality Manager, Daniel Construction Company (DCC)
J. L. Brooks, NDE Supervisor, DCC
L. J. Hinze, Quality Inspector, DCC
H. A. Bamberger, Resident Engineer, Gilbert Associates

NRC Resident Inspector

*J. L. Skolds

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on January 29, 1982 with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed the following new items which were identified as a result of the inspection:

(Open) Unresolved Item 395/82-13-01: "Installation of locking devices" - paragraph 10.

(Open) Unresolved Item 395/82-13-02: "Head lifting structure welds and bolting" - paragraph 8.

The following additional item, although discussed with the licensee, was not identified in the exit meeting but instead in a telephone conversation with H. Donnelly on February 16, 1982.

(Open) Inspector Follow-up Item 395/82-13-03: "Criteria for locating and sizing any indications detected by refracted longitudinal wave scanning" - paragraph 3.d.

3. Licensee Action on Previous Inspection Findings

a. (Closed) Unresolved Item (395/82-02-02): As-built Piping and Piping Records

This item identified several apparent errors found by the inspector in the piping records. The inspector discussed these with the licensee and examined additional records relative to the errors. The inspector found that the licensee had corrected or had a satisfactory explanation for the apparent errors. Further, none of the errors identified appeared to have any safety significance. This item is closed.

b. (Open) Unresolved Item (395/82-02-01): Pressurizer Integral Support Weld Exam

This item was opened to address the inspector's concern that the preservice inspection (PSI) program and records for the pressurizer integral support weld did not appear to adequately identify the weld location nor require that the weld be examined. The licensee informed the inspector that it was believed the support weld was coincident with the pressurizer bottom head to shell weld (pressurizer weld number 1), that the two welds had been examined together, and that the PSI report for weld 1 covered both the bottom head to shell and the support welds.

In the current inspection the inspector was informed by the licensee that:

(1) The support weld is not coincident with the bottom head to shell weld. The welds are identified as weld 15 (support) and weld 1 (head to shell), and separate examinations and reports were completed for each.

(2) The support attachment weld was accomplished by first depositing a weld buildup on the bottom head, then machining the buildup, and finally welding the support skirt to the buildup - apparently resulting in a relatively wide weld.

(3) Although listed out of sequence, the requirement for examination of the support weld was included in the PSI program. Information as to the exact location of the weld was not provided.

The support weld could not be located visually because it had been machined or ground flush with the adjacent base metal. The inspector noted that unless weld location information had been provided to the PSI personnel who performed the examination, there was not adequate assurance that the weld had been properly examined. The licensee indicated that it was obtaining further information relative to this concern from its PSI contractor. This item will remain open pending Region II's evaluation of the additional information to be obtained by the licensee.

c. (Open) Unresolved Item (395/81-17-02): Inspection of Weld Root with 41° Refracted Longitudinal Wave Transducer

Region II originally agreed that this item would be considered resolved when the licensee provided a statement in the ASME Data Report (NIS) for PSI acknowledging that the ultrasonic examination (UT's) on welds in cast stainless steel were performed on a best effort basis utilizing the present state of the art in UT technology. This was to be provided prior to fuel loading. During the current inspection the licensee noted the ASME Code Data Report might not be ready prior to fuel loading and the licensee and Region II agreed that the licensee could provide a letter to Region II if the ASME report was not ready. This letter is to verify that:

(1) The PSI examinations are complete

(2) Or, that the PSI examinations are complete with certain minor exceptions - giving the basis for the exceptions and specifying a date by which the examinations will be complete

(3) The UT examinations of welds in cast reactor coolant piping were performed on a best effort basis utilizing the present state of the art in UT technology.

(4) Engineering evaluations and repairs required as a result of the examinations have been completed (identifying the examination results that required evaluation and/or repair).

d. (Closed) Unresolved Item (395/81-22-01): Calibration Block and UT Procedure for PSI of Main Loop Reactor Coolant Piping

This item dealt with Region II concerns identified when NRC inspectors performing ultrasonic examination on reactor coolant system weld joints discovered that the reactor coolant pipe at Summer was wrought stainless steel, whereas the fittings were statically cast stainless

steel. The inspectors had previously been informed by the licensee that the pipe was cast material. The licensee's reports for PSI UT examinations of pipe to fitting welds indicated that the procedure used was a refracted longitudinal wave procedure developed by their contractor, Westinghouse, for use on cast stainless steel.

Subsequently, the inspectors discovered that this procedure had also been used to examine reactor coolant main loop branch connection welds, where the piping on both sides of the weld was wrought stainless steel.

The Westinghouse refracted longitudinal wave scanning procedure does not provide a fully adequate examination of welds for crack-like discontinuities in cast stainless steel material as reported in paragraph 3 of IE Report 395/81-22. However, properly applied, it does provide a limited "state of the art" examination for welds in cast stainless steel. The inspectors noted the licensee had not demonstrated that the refracted longitudinal wave scanning procedure would provide an adequate examination of the welds to wrought piping. The inspectors contended that the wrought piping may have been more properly examined with a proven shear wave scanning procedure that had been calibrated on a wrought calibration block.

The licensee did not have a wrought stainless steel calibration block representative of the wrought stainless steel reactor coolant main loop piping. The refracted longitudinal wave transducer had been calibrated on a cast stainless steel block. The licensee agreed to demonstrate that their refracted longitudinal wave technique, calibrated on a cast block, would provide examinations through wrought piping that are equivalent to or superior to the commonly used shear wave technique calibrated on a wrought block. This demonstration was conducted by the licensee on January 28, 1982. For this demonstration the licensee obtained and used a wrought calibration block. The wrought calibration block contained a saw-cut notch as described in ASME Section XI (77 edition), Appendix III, Supplement 7(b)(2) and side drilled holes. For the demonstration, the contractor's refracted longitudinal wave transducer was calibrated on their cast calibration block, and a commonly used shear wave transducer was calibrated on the wrought calibration block for comparison. Both calibrations were performed using the contractor's Procedure ISI-205. The two transducers were positioned to obtain the maximum amplitude from the opposite side notch (½ V-path away) on the wrought calibration block. The refracted longitudinal wave transducer produced a signal at the proper sweep range location. When calibrated in accordance with ISI-205, utilizing a double DAC with the 3/4 T hole at 80% screen height (100% DAC), the signal from the notch was within 3 DB's of the shear wave signal produced with a normal code required DAC curve.

ISI 205, which was used in examining the reactor coolant main loop piping welds, requires that all flaw indications which produce a response greater than 75 percent of the primary response reference

level DAC curve be investigated to the extent the examiner can characterize and report data relevant to the shape, orientation, location, and possible source of the indication producing area. This 75% DAC recording and evaluation level further increases the equivalency of the Westinghouse refracted longitudinal wave transducer calibrated on a cast block to the shear wave transducer calibrated on a wrought calibration block and used with normal code DAC and reporting requirements.

As a result of the demonstration, the inspectors concluded that the licensee's refracted longitudinal wave (RL) procedure (calibrated on a cast block) was essentially as satisfactory for detecting discontinuities in wrought stainless steel as the normally used shear wave procedures. It was noted, however, that the refracted longitudinal wave procedure did not contain suitable criteria for locating and sizing flaws. The RL transducer detected the notch in the calibration block at an angle of approximately 20° rather than at the 41° angle specified for the transducer - indicating potential problems in flaw location. Also, when sizing flaws in accordance with ASME characterization requirements, the refracted longitudinal wave transducer examinations will indicate smaller flaw size than if the shear wave tranducer were used. The licensee indicated that no reportable flaws had been detected in its examinations and that, therefore, no location or sizing had been necessary. Based on the inspectors' observations this item is being closed. However, a new item is being opened to identify and provide for follow-up on the sizing and location criteria used for any indications that are detected by the RL procedure in future inservice inspections. This new item is inspector follow-up item 395/82-13-03, "Criteria for locating and sizing any indications detected by refracted longitudinal wave scanning."

4. 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 paragraphs 8 and 10.

5. Licensee Identified Items (10 CFR 50.55(e))

(Closed) Item 395/81-28-03: Undersize Socket Welds on EFWS Pumps

The licensee submitted a final report on this item to Region II in a letter dated September 14, 1981. Additional information relative to the completion of corrective action for this item was provided by the licensee in a letter to Region II dated January 13, 1982. The inspector reviewed the licensee nonconformance report (identified NCN 1343M) and documentation of the repairs and reinspections required for this item and discussed the item with cognizant licensee QA personnel. The inspectors are satisfied that the

corrective action taken by the licensee is adequate. This item is considered closed.

6. Inspector Followup Items

a. (Closed) item 395/82-11-01: Document Changes - White Out

This item involved an inspector's concern that a white opaque correction fluid was being used by licensee personnel, against management direction, to make corrections on documentation. The inspectors examined the licensee's investigation into this matter as documented in their memo of January 26, 1982, identified as CGSS-2069-QCM. The changes made with the correction fluid were reportedly editorial and had no safety significance. The inspectors are satisfied that this item may be closed.

b. (Open) Item 395/81-17-03: UT reporting inconsistencies. This item was opened to identify a concern for errors or inconsistencies found in the reporting of PSI UT examination results. The licensee has indicated that the PSI reports are being reviewed to detect and correct such errors. In the current inspection the inspectors found errors or inconsistencies in the PSI records for examination of reactor coolant pump bolting. The records of the examination for the No. 1 and No. 2 seal housing bolts could not be differentiated, as they were similarly identified. Also, while a summary sheet indicated UT of some of the bolting (required for the No. 1 seal housing bolts), no UT reports were found. The licensee stated that it is believed the missing UT records might be shop examination records (as permitted by the ASME code) and indicated they would check for the records.

The additional apparent errors or inconsistencies found in the current inspection and described above will be followed as a part of item 395/81-17-03 and will be reviewed further in subsequent Region II inspections.

7. Preservice Inspection (PSI)

The inspectors reviewed portions of the licensee's PSI work and records, as described below, to determine their compliance with regulatory requirements and FSAR commitments - including the applicable ASME code requirements, as specified in ASME Section XI (74S75).

a. Observation of Work and Work Activities

The inspectors were unable to observe preservice repair work in progress but reviewed records for three repairs resulting from PSI findings.

The repair records reviewed were as follows:

REPAIR IDENTIFICATION.	CAUSE OF DISCREPANCY
CGE-1-2101 Weld #24	** UT Indications
CGE-2-2550 Weld #5	** UT Indications
CWR-5699	* Visual Indications

NOTE * Repaired by grinding
** Repaired by welding

The above repairs were reviewed to determine whether the following requirements had been fulfilled where applicable:

(1) Approved quality assurance program is applied to control the quality affecting activities of the repair.

(2) Welding is performed by welders who are qualified and are using procedures which are properly qualified.

(3) Welder followed welding procedure.

(4) Welding materials are controlled in accordance with appropriate instructions.

(5) Completed weld meets visual examination acceptance standards, including surface preparation.

(6) Completed weld is examined by qualified examination and certified NDE personnel using approved procedures.

(7) Preservice inspection has been performed and results recorded.

(8) New or repaired pressure retaining welds are pressure tested.

b. Data Review and Evaluation

The inspector selectively reviewed preliminary records of the following PSI nondestructive examinations to verify performance of required examinations and preparation of records therefor:

EXAMINATION CATEGORY	EXAMINATION
BA	UT of weld 12 on Sketch CGE-1-1100
BB	UT of weld 6 on Sketch CGE-1-2100
BC	UT of weld 1 on Sketch CGE-1-1100
BD	UT of weld 19 on Sketch CGE-1-1100A
BO	UT of welds on Sketch CGE-1-1300
CA	UT of weld 1 on Sketch CGE-2-1200
CB	UT of weld 3-5 on Sketch CGE-2-1220
CC	Penetrant exam (PT) of weld WS 1-4 on Sketch CGE-2-1210
CD	UT of B1-3 and visual exam (VT) of 1-B1 thru B20 on Sketch CGE-2-1220
CE-1	Magnetic particle exam of weld WS-1 on Sketch CGE-2-2300
CG	UT of welds 1 and 18LS on Sketch CGE-2-2300
BG-1 and -2	UT and VT of bolting on Sketch CEG-1-5100A

The inspector found apparent errors or inconsistencies in the records for UT and VT of the reactor coolant pump bolting shown on licensee Sketch CGE-1-5100. These errors or inconsistencies are described in paragraph 6.b above.

8. Review of As-Builts

The inspectors selectively examined piping, structures and their associated records, as described below, to determine whether the applicable specifications, drawings and discrepancy documentation correctly reflect the as-built conditions.

a. Piping

The inspectors reviewed the construction records for the below listed field weld joints in safety related piping systems to verify proper weld location, identification, nondestructive examination and piping materials (including size):

(1) Weld joints 3, 5, 6 and 7 on construction drawing SE-FW-13R5EE
(2) Weld joints 1 and 3 on construction drawing SE-SI-13R1
(3) Weld joints 5 and 6 on construction drawing SE-RC-05 R3

The specification for the above piping is identified as SP-220-044461-000, Revision 9.

b. Structures

The inspectors examined selected examples of seismic category 1 structures, as described below, to verify that their as-built conditions were correctly reflected on the licensee's drawings and any associated discrepancy reports.

(1) Fuel Oil Day Tanks

The below listed fuel oil day tanks were inspected to determine whether the structural assembly configuration; and joint location/orientation, dimensions and configuration conform to the design requirements:

TANK	DRAWINGS
A	Colt Dwg. 5931-BR7, SCEG Dwg. 1MS-32-80-8
B	Colt Dwg. 5931-BR7, SCEG Dwg. 1MS-32-80-8

In addition, measurements were made to verify correct wall thickness.

The inspectors noted several flange joints with loose fasteners on the bolting or with incorrectly installed fasteners. These were corrected by the licensee.

(2) Reactor Vessel Head Lifting Structure

The ispectors examined the partially assembled head lifting structure to determine whether the structural assembly configuration; and joint location/orientation, dimensions and configuration conform to the design requirements depicted on drawings 1098E56 and 583F754. The inspectors found that the Keeper Plate bolting (item 13 on Dwg. 1098E56) at some joints was different than specified by drawing, in that there was no provision for for locking wires and no locking devices were present. In addition, the inspector found lack of fusion and apparent grinding damage (1 to 2 inches long) on a spreader assembly weld in apparent violation of requirements depicted on drawing 583F754. The licensee stated they would assure that proper bolting and locking devices were provided for assembly of the lifting, structure and that they would evaluate the apparent weld discrepancies described above. The acceptability of the welds and bolting on the head lifting structure is considered an unresolved item and is identified 395/82-13-02, "Head Lifting Structure and Bolting".

Within the areas examined, no violations or deviations were identified.

9. Reactor Coolant Pressure Boundary Piping

The inspectors reviewed welding and non-welding quality records for reactor coolant pressure boundary piping as described below to determine whether applicable code and procedure requirements were met. The applicable code for reactor coolant pressure boundary piping is the ASME Boiler and Pressure Vessel Code, Section III, subsection NB, 1971 edition including Addenda through S73.

a. Welding Activities

Weld records, including welder qualification records, were reviewed for welds FW-10 and FW-11 on ISO DE-RC-06-A. These are 31" diameter X 2.48" thick reactor coolant welds. The root pass portion of the records were reviewed in the following areas:

(1) Weld identification and identification of parts on the weld record were compared with the weld identification and parts identification on the isometric drawing.

(2) Records were reviewed to determine if specified procedure was used.

(3) Welder qualification records for the root passes were reviewed.

(4) Records were reviewed for evidence of QC verification of root pass. QC inspection of "hot pass" rather than root pass was required.

b. Non-Welding Activities

Records for the fo lowing piping work activities were reviewed:

(1) Receiving Inspection

Receiving inspection records consisting of "Receiving Inspection Report," "Receiving Inspection Checklist," "Document Package Index," "SCE&G Certificate of Inspection," "Vendor Material Certifications," and "Code Data Report" were reviewed for the following pipe spools:

ISO	SPOOL	SIZE
SE-SI-13	1SI-13-01	12"
SE-RC-05	1RC-05-02	4"
SE-RH-09	1RH-09-05	12"

The records were not reviewed in detail, but to the extent necessary to determine that DCC procedure AP-VIII-01, revision 15, "Receiving Inspection of ASME Code Related Material" was being followed.

(2) Cleanliness

Cleanliness requirements are specified in Westinghouse Specification 292722, revision 8, "Cleaning and Cleanliness Requirements of Equipment for use in the Nuclear Steam Supply System and Associated Components." The applicable site procedure

for flushing is SCE&G "Generic Flushing Instruction" GI-F, revision 1. The applicable procedure for cleaning piping during installation is DCC procedure WP-VII-05, revision 1, "Cleaning and Storage of Fabricated Piping and Subassemblies." Inspection of cleanliness during installation is covered by DCC procedures QCP-II-03, revision 15, "Welding of Materials" and QCP-VII-09, revision 15, "Pipe Installation Inspection."

(a) Flush records and procedures for the following piping were reviewed and compared with the above procedures:

PIPE	PROCEDURE
RHR Pump Suction Header	RH-01-F2
RC Loop	RC-01-F1
Safety Injection High Head	SI-01-F1
RTD Manifold Loops	RC-03-F1

(b) The following piping installation cleanliness records were reviewed and compared with the above procedures:

ISO SE-RH-06	-	"Release For Piping Insulation" dated 1/22/82 from PAB 3-001 to PAB 3-021 Fitup inspection at welds FW-5 and FW-6
ISO SE-SI-04	-	"Release for Piping Insulation" dated 1/22/82 From Weld FW-14 to weld FW-15 and from weld FW-13 to S1H062 Fitup inspection at welds FW-13, FW-14 and FW-15
ISO DE-RC-06-C		"Release For Piping Insulation" dated 10/9/81 Fitup inspection at welds FW-4 and FW-1

(3) RC Loop As-built Drawings

The inspector discussed "as-built" drawings for the RC loop with the licensee. Although "as-built" drawings per se were not issued for the loop piping, Gilbert Associates piping installation layout drawings E304601 and E304602 are considered to reflect the as-built condition of the loops. The RC equipment was installed to specified locations and the RC loop spool pieces, which have

"as-built" drawings, installed and welded to the equipment. The piping locations resulting from the equipment locations and the as-built pipe spool drawings represent the piping locations analyzed. No deviations outside the tolerances allowed by the layout drawings or deviations from the pipe spool as-built drawings were required.

The inspector reviewed as-built Westinghouse drawings 2179CGE, Sh.4, Loop A hot leg; 2179CGE, Sh.3, Loop A cross over; and 2179CGE, Sh.1, Loop A cold leg and compared the drawings to the Gilbert Associates layout drawings.

Within the areas inspected, no violations or deviations were identified.

10. IE Information Notice No. 81-33 - Locking Devices Inadequately Installed on Main Steam Isolation Valves (MSIV's)

The inspectors examined the licensee's MSIV's to determine whether discrepancies reported in Information Notice No. 81-33 existed on the three Atwood Morrill MSIV's at Summer. At the time of this inspection the licensee had not made his inspection of these valves. The inspectors found that all three valves had external vendor locking device discrepancies as noted in the I.E. Notice. In addition the inspectors noted that the Atwood Morrill valves were different in design than those previously reported deficient on BWR Plants. One difference was that Summers' valves also had internal locking devices identical to those improperly installed on the valve stem locking plates. The licensee notified Atwood Morrill of the discrepancies and asked Atwood Morrill to determine the safety significance if the internal fasteners were to come loose as a result of the locking devices failing to secure them. Atwood Morrill's preliminary evaluation was that this condition would not effect the valves ability to close. The licensee was notified that this item would be reported as unresolved item 50-395/82-13-01, "Installation of Locking Devices." The licensee stated that the external locking devices would be bent immediately. As for the internal locking devices, the licensee committed to the following:

(1) A copy of the vendors' evaluation with SCE&G concurrence on the evaluation, will be forwarded to the NRC.

(2) Interior locking plates will be checked at next scheduled maintenance.

(3) A generic procedure for locking devices, based on military spec 763 (except 50% engagement of the locking plate will be acceptable), will be prepared for the crafts.

Within the areas examined, no violations or deviations were observed.