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

Report No. 50-395/80-30

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

Facility Name: Summer

Docket No: 50-395

License No. CPPR-94

Inspection at Summer site near Columbia, South Carolina

Inspector: E. H. Girard — 12/30/80
E. H. Girard — Date Signed

Approved by: for A. R. Herdt, Section Chief, RCES Branch — 12/30/80
Date Signed

Inspection on October 20-24, 1980

Areas Inspected

This routine, unannounced inspection involved 42 inspector-hours on site in the areas of licensee action on previous inspection findings, licensee identified items (50.55(e)), review of preservice inspection procedures, and observation of preservice inspection work.

Results

No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

*O. S. Bradham, Manager, Summer Station
*D. A. Nauman, Group Manager - QA
*S. J. Smith, Maintenance Supervisor - Nuclear Operations
*D. R. Moore, Director of Surveillance Systems
*A. A. Smith, Site QA Coordinator
*J. Turkett, Maintenance Engineer
*J. M. Woods, QC Manager
*M. W. Clonts, Mechanical QC Supervisor
*H. Radin, Nuclear Engineer
*T. A. McAlister, QA Surveillance Specialist

Other Organizations

W. L. West, Project Quality Manager, Daniel Construction Company
R. Dail, Welding Engineer, Gilbert/Commonwealth
*R. H. Fleming, Resident Engineer, Gilbert/Commonwealth
*R. Weber, Westinghouse Nuclear Products
*D. Spooner, Virginia Corporation

NRC Resident Inspector

*J. L. Skolds

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on October 24, 1980 with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Inspection Findings

a. (Closed) Infraction (395/79-35-02): Undersized Socket Welds

The licensee identified this as a 10 CFR 50.55(e) item (see item 395/79-36-04 in paragraph 5.b below) and addressed the corrective actions in a final report to Region II dated December 5, 1979. The NRC inspector has examined the licensee's corrective actions as described in the licensee's report. The NRC inspector reviewed training records for socket weld inspection, examined examples of accepted socket welds and reviewed records for reinspections and repairs of socket welds. The NRC inspector concluded that the licensee had determined the full extent of the noncompliance, performed the necessary survey and followup actions to correct the conditions present and developed actions to prevent recurrence of

similar circumstances. The corrective actions identified to Region II by the licensee have been implemented.

b. (Closed) Unresolved Item (395/79-35-04): QC Inspector's Work Questioned Because of Reportedly Bypassed Inspections.

The NRC inspector reviewed results of final visual reinspections performed by the licensee on 138 socket welds described on isometric drawings DE-RH-08, DE-RH-10, DE-RC-12, DE-SI-16 and DE-SI-20. Thirty-six of these welds were originally inspected and accepted by the inspector who allegedly bypassed inspections. A comparison of reinspection results obtained on welds inspected by this QC inspector with results obtained on the welds previously accepted by the other QC inspectors who inspected welds in these areas did not indicate any significant differences. Both showed rejection rates from reinspection of 50 to 60%. The NRC inspector was satisfied that the licensee's program of visual reinspection of safety-related socket welds would provide for identification and correction of unacceptable conditions resulting from unsatisfactory work accepted by the named QC inspector and other QC inspectors except for possible improper back outs, as covered by item 395/79-35-09 below. This item is closed.

c. (Closed) Unresolved Item (395/79-35-05): Fitup for Butt Welds Did Not Meet Requirements and Grinding to Correct the Misalignment Resulted in Underwall Conditions.

The licensee identifi several examples of improperly fitup and overground welds in their reinspection of 200 (out of a lot of about 2400) ASME Section III Class 3 butt welds. Subsequently, in response to an allegation regarding a specific weld, Region II confirmed an additional example of an improperly fitup and overground ASME Section III Class 3 weld (identified as infraction 395/80-20-01). The examples found by the licensee were analyzed and determined to be acceptable. Based on the results obtained, the licensee concluded that the entire lot of 2400 welds had sufficient design conservatism to assure the welds would adequately meet applicable design criteria. Analysis on the discrepant weld identified by Region II had not been completed but was underway. Item 395/79-35-05 is closed. A final review of the licensee's response to this area will be addressed to item 395/80-20-01 when the licensee's analysis of the discrepant weld covered by that item is complete.

d. (Open) Infraction (395/80-20-01): Failure to Follow Fit Up Procedure

The licensee has submitted a response to this item but they have not (as noted in 3.c above) completed their design analysis of the discrepant weld condition which the item represents. This item will be examined further by Region II in subsequent inspections.

e. (Closed) Unresolved Item (395/79-35-06): Small Diameter Non-Code Piping Used in ASME Section III Class 1 Application

This item originated as an allegation that some non-code piping had been substituted for code piping in an ASME Section III Class 1 application. The piping in question was small diameter (2 inch) stainless steel piping. Based on a review of the licensee's controls and checks, the NRC inspector was not able to either confirm or deny this allegation. The licensee has informed the inspector that all of their non-code piping was purchased to the same ASTM material specifications as the code piping (ASTM A312 and A376). The non-code pipe would not, however, have the additional assurances of soundness provided by code-added nondestructive examinations. The NRC inspector does not consider the possible presence of some small diameter non-code piping (of the quality described) in a Class 1 application to be a significant safety concern. This item is closed.

f. (Closed) Unresolved Item (395/79-35-08): Underwall Condition on a 6000 # Reducer Insert

This item originated as an allegation that an undersize reducer insert had been installed in safety-related piping. In a safety-related piping surveillance, which the licensee stated was not related to this item, the licensee has identified and dispositioned a 3000# reducer insert installed where a 6000# insert was required. The inspector reviewed the final hardware and documentation checks being performed by the licensee to assure that any other improper sized materials are identified for proper disposition. The inspector considers the checks satisfactory. This item is closed.

g. (Open) Unresolved Item (395/79-35-09): Pipe Not Properly Backed Out of Sockets.

This item originated as an allegation that pipe had not been properly backed out of fittings during fitup for socket welding, violating code and procedural requirements. Such back out is specified to assure that thermal contraction in cool down from welding will not pull pipe against the bottom of the socket producing undesirable stresses in the weld or fitting. In response to this item the licensee has radiographed 265 safety-related socket welds (out of approximately 14,000 installed) to reveal the gap remaining after welding and has evaluated the likelihood of a service failure in socket joints prepared without proper back out. The NRC inspector has requested that the licensee provide Region II with a formal submittal of their data and analyses relative to this matter, and with a description of any further steps they will take to assure the adequacy of their safety-related socket welds. The NRC inspector also requested that the licensee consider performing additonal examinations on a selected group of socket welds to be chosen on the basis of factors such as the consequences of their failure,

severity of service conditions, historical service information, etc.

h. (Closed) Unresolved Item (395/79-35-10); Improperly Repaired SW Line Piping.

This item originated as an allegation that the service water (SW) line had been damaged and repaired without proper controls or inspection. The NRC inspector reviewed the licensee's response to this concern as described in a South Carolina Electric & Gas Company, Nuclear Engineering Office letter dated July 7, 1980 and identified CGSS-4581. This letter reported that the SW line was designed very conservatively. The pipe used was noted to have a nominal .375 inch wall whereas the design required only about .060 inch. Based on this reported design conservatism and the lack of any identified defect produced by the alleged repair, the inspector does not consider this item to present a significant safety concern. This item is closed.

i. (Closed) Unresolved Item (395/79-35-12): Alleged Violations of Socket Welding Procedure Requirements.

The licensee addressed concerns with regard to alleged welding procedure violations in the letter referenced in 3.h above and in two additional letters from their design welding engineer (letters from R. L. Dail to H. Radin dated 4/2/80 and 5/8/80). The NRC inspector reviewed these letters and discussed their contents with the licensee's engineering personnel. Based on the information presented in the referenced letters, discussions with licensee engineering personnel, observation of a sample of welds from those questioned, and information obtained in questioning site craft and inspection personnel; the inspector is satisfied that the allegations posed in this item do not present a significant safety concern. The item is closed.

j. (Closed) Unresolved Item (395/79-35-13): Underwall Socket-Welding 90° Elbows.

This item originated from concerns expressed by several individuals that improper size (underwall) 90° socket-welding elbows had been installed in safety-related piping. In inspections conducted as corrective action for item 395/79-35-02 (3.a above) the licensee identified an underwall socket-welding fitting installed in safety-related piping. The NRC inspector has discussed the final inspection verifications being performed on safety-related piping with the licensee. The inspector is satisfied that these inspection verifictions should identify and provide for disposition of improper size (wall) piping materials. This item is closed.

k. (Closed) Unresolved Item (395/79-35-14): Violations of High-Low Requirements on Difficult to Reach Welds.

The NRC inspector considers this item to have been adequately addressed through the licensee's sample checks described for item 395/79-35-05 above (see 3.c.). This item is closed on the same basis as item 395/79-35-05.

4.. Unresolved Items

Unresolved items are items 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 paragraphs 6.d and 7.a.

5. Licensee Identified Items (50.55(e))

a. (Closed) Item 395/79-24-02: Deficient Pipe Hanger Installations.

The licensee submitted a final report on this item to Region II on March 21, 1980. The NRC inspector has reviewed the licensee's corrective action on this item and has no further questions. This item is closed.

b. (Closed) Item 395/79-36-04: Deficient Socket Welds.

The licensee submitted a final report on this item to Region II on December 5, 1979. The licensee's corrective action has been reviewed as described in paragraph 3.a above. The inspector has no further questions on this matter. The item is closed.

c. (Closed) Item 395/80-05-06: Deficient Class 3 Butt and Attachment Welds

The licensee submitted a final report on this item to Region II on March 21, 1980. The inspector has reviewed the licensee's corrective action and has no further questions. This item is closed.

d. (Closed) Item 395/80-10-05: Potential Stress Corrosion Cracking of Control Rod Guide Support Pins.

The licensee submitted a final report on this item to Region II on September 3, 1980. The inspector reviewed the licensee's comments on the safety significance of the item and their planned actions as described in the report. The inspector has no further questions on this item. The matter is closed.

e. (Open) Item 395/80-30-01: Pipe Hanger Material Traceability.

On October 10, 1980, the licensee informed Region II that some of their safety-related pipe hangers had apparently been fabricated from non safety-related material. The licensee is evaluating the safety significance.

f. (Closed) Item 395/80-30-02: Emergency Feedwater Pump Impellar.

On July 24, 1980, the licensee informed Region II of a problem with an emergency feedwater rotating asembly failure. The failure occurred during the start-up program. The licensee, as a result of discussions with the pump manufacturer, does not consider the condition reportable. They consider identification of such problems to be a function of the start up program. The inspector has no further questions for the licensee on this item and it is considered closed.

6. Preservice Inspection - Review of Procedures

The NRC inspector reviewed the preservice inspection (PSI) procedures indicated below to determine whether the procedures were consistent with regulatory requirements and licensee commitments. The applicable code for PSI identified in the licensee's FSAR is the 1974 edition of ASME Section XI.

a. Inspection Procedures ISI-15 (Rev. 6, Am2), "Ultrasonic Examination of Studs, Bolts and Nuts" and ISI-47 (Rev. 2, Am.6), "Manual Ultrasonic Examination of Circumferential and Longitudinal Butt Welds in Ferritic Vessels of 2½ Inches Thick or Greater". These procedures were reviewed for:

(1) Procedure approval

(2) Qualification requirements for personnel

b. "Preservice Examination Program for V.C. Summer Unit 1 with Changes 1 and 2"

This document was reviewed for proper specification of examination category, method of examination, and extent of examination for areas B-G-1 and B-I-1 of IWB-2500 of ASME Section XI.

c. Inspection Procedure ISI-11 (Rev. 9, Am. 3), "Liquid Penetrant Examination Procedure

This Procedure was reviewed for:

(1) Method consistent with code requirements

(2) Specification of brand names and types of penetrant materials

(3) Requirements on sulfur and halogen content of penetrant materials.

(4) Procedure requalification on changes in surface treatments, precleaning, penetrant materials or penetrant process.

The NRC inspector found that this procedure appeared unsatisfactory in the areas described in paragraph 7. a below.

d. Inspection Procedure ISI-70 (Rev 0, Am. 1, with Changes 1 and 2), "Magnetic Particle Examinations"

This procedure was reviewed for:

(1) Specification of continuous method and proper surface preparation

(2) Particle color and component surfaces temperature requirements for dry particle examinations

(3) Proper liquid medium and surface temperature requirements for wet particle examination

(4) Fluorescent particle viewing conditions

(5) Overlap and field direction requirements

(6) Prod spacing and provisions to reduce arcing

(7) Prod magnetizing current

(8) Current and technique for coil method

(9) Acceptance criteria

(10) Record requirements for examination results entries, examination equipment and materials, and data sheets.

In his review the NRC inspector found that this procedure appeared unsatisfactory. It did not appear to be a procedure in that it provided a listing of general requirements rather than specific steps. For example, it identifies three acceptable methods (prods, yoke or coil), permits use of wet or dry powder, etc. The requirements are not even clearly separated into sections limited to a single method. The attached, unincorporated amendment to the procedure makes changes or additions to requirements in 15 subsections of the procedure, adding to difficulties in identifying and following the requirements for the various methods, powder types, etc. covered by the basic procedure. Further, the procedure does not appear to comply with ASME Section V (envoked by ASME Section XI) requirements as follows:

- Code Requirement T-723 requires use of continuous magnetization with the magnetizating current on while the powder medium is applied.

ISI-70 Subsect. 5.3 requires use of the continuous method only "when practical" and permits wet powder medium to be applied up to 20 seconds prior magnetizing.

- Code Requirement T-732.2 specifies magnetizing current requirements for the coil method. Code Requirement T-751 requires that the examination procedure include the magnetizing current. ISI-70 does not specify a magnetizing current for the coil method.

- Code Requirements T-731.3 and T-732.2 specify that the magnetizing current for the prod and coil methods be direct or rectified (AC).
  ISI-70 Subsect. 5.1 requires use of rectified AC only "when practical" for these methods. As noted in paragraph 7.b below, the licensee's Level II magnetic particle examination examiner informed the NRC inspector that he was conducting examinations to the procedure (ISI-70) with a coil that used unrectified AC magnetizing current.

- Code Requirement T-751 requires that the procedure include the ferromagnetic particles to be used giving manufacturer, color, and wet or dry.
  ISI-70 Sect. 2.4 identifies five powders which might be used but does not limit itself to use any or all these.

- Code Requirement T-751 requires that the procedure include sketches or a chart indicating coverage, where necessary for clarity.
  ISI-70 requires 100% overlap for complete coverage but neither states in word nor provides sketches or charts to show the overlap required to achieve coverage with the different methods and equipment permitted to be used.

The inspector also noted that the licensee's procedure ISI-70 does not include or provide reference to instructions or a form for recording all of the data required by ASME Section XI (IWA-1400 h). Also, the licensee's procedure OPS-NSD-101 (Rev. 5, Am. 2) which describes documentation requirements for PSI does not provide requirements for recording of magnetic particle examination information as it does for other types of examination.

The inspector witnessed performance of examinations specified to this procedure as described in 7.b below. As the performance provided a satisfactory examination, the safety significance of the procedural inadequacies is unresolved. The procedural inadequacies are considered to be an unresolved item, identified 395/80-30-03, "Magnetic Particle Examination Procedure".

e. Inspection Procedures ISI-205 (Rev. 2, Am. 3), "Manual Ultrasonic Examination of Full Penetration Circumferential and Longitudinal

Butt Welds" and OPS-NSD-101 (Rev. 5, Am. 2) "Preservice and Inservice Inspection Documentation"

These procedures were reviewed for record compilation requirements including:

(1) Examination results and data sheets

(2) Examination equipment data

(3) Calibration data

(4) Couplant Material

(5) Calibration blocks

No deviations or items of noncompliance were identified.

7. Preservice Inspection - Observation of Work and Work Activities

The inspector observed the PSI activities described below to determine whether these activites were being performed in accordance with regulatory requirements and licensee procedures. The code applicable to the PSI is the 1974 edition of ASME Section XI.

a. Penetrant Exam of Reactor Vessel Head Cladding Patches 1, 5 and 6 using Procedure ISI-11 (Rev. 9, Am 3 with changes 1 and 2)

This examination was observed for:

(1) color contrast method employed

(2) proper penetrant materials

(3) verifying data on penetrant materials sulfur and halogen contents

(4) pre-examination surface cleaning

(5) drying time after cleaning

(6) penetrant application method and time

(7) temperature of examination surface

(8) penetrant removal

(9) dry surface prior to developing

(10) type of developer and application method

(11) examination technique and time between developer application and evaluation

(12) technique for evaluation of indications

(13) reporting of results

(14) procedure requalification requirements

In observing preparation of the cladding for examination, the inspector noted that the surface was power wire brushed. As power wire brushing may close surface openings and be detrimental to the examinations, the inspector questioned its use. He was informed by the licensee that they did not consider it detrimental and had used it widely. However, the licensee was not able to submit a record of the re-qualification required by T-682 of ASME Section XI to confirm the acceptability of power wire brushing. The inspector's concern relative to the use of the practice and the absence of the code required requalification is identified as inspector followup item 395/80-30-05, "Power Wire Brushing Surfaces to be Penetrant Examined."

In observing performance of the examination the inspector noted that the penetrant materials used were not those specified in the procedure:

Material	Procedure Required	Used
Penetrant Remover	Spot-Check SKC-S	Dubl-Chek DR-60
Penetrant	Spot-Check SKL-S	Dubl-Chek DP-51
Developer	Spot Check SKD-S	Dubl-Chek D-100

ASME Section V, T-681, requires that the procedure include the brand name and specific type of penetrant, penetrant remover and developer. The inspector was informed that a test had been performed which demonstrated the equivalency of the penetrant materials used to those specified by the procedure. The NRC inspector identified the inadequacy in the procedure as unresolved item 395/80-30-04, "Penetrant Examination Procedure."

b. Magnetic Particle Examination of Reactor Vessel Head Studs 19 and 41 Using Procedure ISI-70 (Rev. 0, Am. 1 with changes 1 and 2)

This examination was observed for:

(1) use of continuous method and proper surface preparation

(2) surface temperature

(3) viewing conditions

(4) coverage

(5) current and technique

(6) results

In addition, the inspector observed a demonstration of the adequacy of the methods used on a standard specimen.

Because of the NRC inspector's concerns with regard to the adequacy of the examination procedure, as described in 6.d above, the inspector questioned the Level II examiner performing the examination. He was asked how much overlap was required. The examiner quoted specific requirements which he stated were given in the procedure. The procedure did not contain the requirements which the examiner quoted. However, the overlap stated and used by the examiner met code requirements. The NRC inspector questioned the examiner as to the magnetizing current for a coil used in the examination. The examiner stated that the coil provided unrectified AC magnetizing current.

No deviations or items of noncompliance were identified.