



NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report No.: 50-395/78-26

Docket No.: 50-395

License No.: CPPR-94

Category: A3

Licensee: South Carolina Electric and Gas Company
Post Office Box 764
Columbia, South Carolina 29202

Facility Name: V. C. Summer Nuclear Station, Unit 1

Inspection at: Fairfield County, South Carolina

Inspection conducted: October 31 - November 2, 1978

Inspectors: E. J. Vallish
N. Economos
B. Crowley
J. Lenahan

Reviewed by:

J. C. Bryant
J. C. Bryant, Chief
Engineering Support Section No. 1
Reactor Construction and Engineering Support
Branch

11/21/78
Date

Inspection Summary

Inspection on October 31 - November 2, 1978 (Report No. 50-395/78-26)

Areas Inspected: Welder training and qualification program, safety-related installation of the service water, containment spray, RHR and high pressure safety injection pumps; progress of installation of electrical penetrations, major safety-related mechanical components and safety-related pipe dynamic snubbers; QA procedures, work and quality records for containment prestressing; service water pump house settlement records and work on the service water pond dams. The inspection involved 72 inspector-hours on-site by four NRC inspectors.

Results: No items of noncompliance or deviations were identified.

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DETAILS I

Prepared by:

E. J. Vallish
E. J. Vallish, Mechanical Engineer
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

11-21-78
Date

Dates of Inspection: October 31 - November 2, 1978

Reviewed by:

J. C. Bryant
J. C. Bryant, Chief
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

11/21/78
Date

1. Persons Contacteda. South Carolina Electric and Gas Company (SCE&G)

*J. F. Alger, Site Manager
*D. A. Nauman, Quality Assurance Manager
*H. I. Donnelly, Jr., Site QA Coordinator
J. E. Bocock, QA Mechanical Supervisor
S. E. Cash, Senior QA Surveillance Specialist

b. Contractor OrganizationsDaniel Construction Company (DCC)

*W. L. West, Project Quality Assurance Manager
K. E. Heaton, Piping/Welding QC Engineer
J. Frick, Mechanical QC Supervisor

*Denotes present at the exit interview.

2. Licensee Actions on Previous Inspection Findings

Licensee actions on previous inspection findings were not reviewed during this inspection.

3. Unresolved Items

No unresolved items were identified during this inspection.

4. Independent Inspection Effort

This effort included the progress of installation of the safety-related mechanical components in the reactor and auxiliary buildings, including

the reactor vessel, steam generators, pressurizer and in-core instrumentation system; general construction activities and the progress of installation of the safety-related pipe support and restraint systems.

No items of noncompliance were identified.

5. Containment (Penetrations) Work Observation

One electrical penetration was observed to be welded into the containment shell. The licensee's representative stated that electrical penetrations were first starting to be installed and that none were very far along toward complete installation.

No items of noncompliance were identified.

6. Follow-up on Regional Requests

This effort was to include a review of the QA records for final setting of the Service Water Pumps, and to review the detailed installation requirements of the containment spray pumps, the residual heat removal (RHR) pumps, and the high pressure safety injection pumps and to confirm their proper installation by review of the QA records.

The following documents were reviewed to determine the licensee's commitments and QA/QC requirements for the installation of these pumps:

SCE&G Field QC Procedure 6.2.1, "Inspection of Alignment of Rotating Equipment"

SCE&G Field QC Procedure 6.2.2, "Installation of Rotating Equipment"

DCC Construction Procedure AP-VIII-03 R5, "Cleaning, Handling and Preservation", and Exhibit A, "Plant Equipment Maintenance Log"

a. Service Water Pumps

The following GAI drawings were reviewed and used to verify locations, orientation details and installation requirements for these pumps:

E-026-102 R13, "Service Water Screen and Pump House Plans and Sections"

E-426-702, "Service Water Intake Screen and Pump House Plan - Floor Ele 425'-0" - Concrete Outline"

E-426-703, "Service Water Intake Screen and Pump House
Plan - Floor Ele. 436'-0" "

The SCE&G audits of Goulds Pumps were reviewed in File 301.1.7, "Surveillance and Audits". These were the pre-award of contract QA audits of the vendor on December 10 and 11, 1974, and February 12 and 13, 1975, and a pre-shipping of pumps audit inspection of June 29 and 30, 1977. All findings were dispositioned in a timely, adequate manner.

The installation of the three service water pumps was inspected in the service water pump house. These pumps are identified as XPP-39A, B and C - SW. Some discharge piping is connected to the pump bowls, but the discharge header is disassembled and awaiting the backfilling of the lines outside the pump house structure. The pump motors are not mounted on the pumps and final alignment and grouting of the pumps is yet to be accomplished. Nonconforming Condition Notice (NCN) 0527 dated October 24, 1978, concerning the three pumps' discharge flange connections was reviewed. Actions are being taken to resolve this open NCN.

No items of noncompliance were identified.

b. Containment Spray and RHR Pumps

The following documents were reviewed and used to verify the location, orientation details, and detailed installation requirements for these pumps.

GAI drawing E-412-070 P4, "Auxiliary Building - Third Basement
Floor EL 370'-0" - Section"

Ingersol-Rand drawing C-8X20WDF86X11-E, "General Arrangement"

GAI drawing E-412-061, "3rd Basement Floor Elevation 374'-0" -
Southeast - Concrete Outline"

Installation of these pumps has one containment spray and one RHR pump in a room; the other one of each pump is in an adjacent room.

Inspection was made of the installation of RHR pumps XPP 31B RH and XPP 31A RH. Both pumps are mounted and grouted with suction and discharge lines attached. The drive motors are not installed. The licensee stated that preliminary alignment is completed, but final alignment and setting will follow the disposition of outstanding NCN's 423M, 476M and 472M. These NCN's were reviewed and action by the licensee is adequate and timely.

The installation of the containment spray pumps XPP 38A SP and XPP 38B SP was inspected. These pumps and their speed reducers and motors have had preliminary alignment settings, but are not coupled together. The licensee stated that final alignment and setting will be done after disposition of outstanding NCN's 554M, 476M, 552M, 554M and DN's 1710M and 1375M. The NCN's and DN's were reviewed and found to be current with adequate and timely disposition actions.

File 307 SP XPP 38A was reviewed and contained "Check Form for Mechanical Vessels", dated May 27, 1978, which verified centerlines and elevations of the pump installation, and the FQC Form 6.2.2-1, "Inspection of Installation of Equipment", dated September 11, 1978, certifying status of installation and referencing applicable NCN's and DN's. File 307 SP XPP 38B was reviewed and contained comparable data for that pump installation.

No items of noncompliance were identified.

c. High Pressure Safety Injection Pumps

The following GAI drawings were reviewed and used to verify locations, orientation details and installation requirements of the safety injection pumps XPP 0043A, B and C.

E-412-101, "Auxiliary Building - 2nd Basement Floor - Elevation 388'-0" - North Concrete Outline"

E-412-109, "Auxiliary Building - 2nd Basement Floor - Elevation 388'-0" - Sections"

The installation of the three pumps was inspected. The units were grouted-in, pipe installation was incomplete and the couplings between the motor and the speed reducer and between the speed reducer and the pump were not installed. DN 1268M relating to a flanged joint fit-up on the "C" pump is outstanding and is being dispositioned.

File 307 CS XPP0043A, "Charging/Safety Inspection Pump A", was reviewed and included the "Inspection of Installation of Tanks, Vessels, Heat Exchanges", FQC Form 6.2.2-1, dated May 10, 1977, which certified the pump's proper location, both centerlines and elevation.

File 307 CS XPP0043B contained similar documentation for the B pump.

File 307 CS XPP0043C indicated preliminary settings on "Check Form for Mechanical Vessels". The licensee's representative stated final setting certification is pending the resolution of DN 1268M.

No items of noncompliance were identified.

7. Exit Interview

A meeting was held with the licensee's representatives identified in paragraph 1 and others to discuss the results of this inspection. Items discussed included the service water pumps, containment spray pumps, RHR and safety injection pumps, and also the progress of installation of electrical penetrations and safety-related mechanical components and safety-related pipe dynamic snubbers. The licensee was informed that no items of noncompliance or new unresolved items were identified. The licensee's representative acknowledged these findings.

DETAILS II

Prepared by: J. J. Lenahan 11/21/78
 J. J. Lenahan, Civil Engineer
 Engineering Support Section No. 1
 Reactor Construction and Engineering
 Branch Date

Dates of Inspection: October 31 - November 2, 1978

Reviewed by: J. C. Bryant 11/21/78
 J. C. Bryant, Chief
 Engineering Support Section No. 1
 Reactor Construction and Engineering
 Support Branch Date

1. Persons Contacted

a. South Carolina Electric and Gas Company (SCE&G)

*J. F. Algar, Site Manager
 *H. I. Donnelly, Site QA Coordinator
 *A. A. Smith, Civil QA Supervisor
 J. Counts, QC Receiving Supervisor

b. INRYCO, Inc.

F. Rubio, QC Manager
 J. Brown, Lead QC Inspector
 W. Murray, Project Manager

c. Gilbert Associates, Inc. (GAI)

G. T. DeMoss, Resident Engineer

*Denotes those present at the Exit Interview.

2. Licensee Actions on Previous Inspection Findings

This area was not inspected.

3. Unresolved Items

No new unresolved items were identified during this inspection.

4. Independent Inspection Effort

The inspector examined the overall status of construction, service water pumphouse settlement records, piezometer data obtained from piezometers installed in the North Dam of the service water pond and in the fill around the service water pumphouse, and condition of the slope protection (rip rap) which has been placed on the service water pond dam slopes and adjacent shore sections.

No deviations or items of noncompliance were identified in the areas examined.

5. Containment (Prestressing) - Review of Quality Assurance Implementing Procedures

The following procedures and specifications were examined to determine if materials, work activities, quality control and quality assurance functions were provided for as stipulated in NRC requirements, and FSAR Sections 3.8 and 17:

Specification SP-207, "Fabrication and Installation of Reactor Building Post Tensioning Systems"

SCE&G CR-1, "Instruction for Receipt and Storage Inspection of Tendon Conduit, Couplings, Embedded Anchorages, Tendons, and/or Other Related Post-Tensioning System Items"

INRYCO Field Installation Manual, Procedures F2.0 through F7.2

No items of noncompliance or deviations were identified.

6. Containment (Prestressing) - Observation of Work and Work Activities

The inspector examined the storage conditions of tendons, shims, grease cans, field anchors, protective grease and other related post-tensioning system components. Storage requirements are specified in SCE&G CR-1 and the INRYCO Field Installation Manual.

INRYCO has completed installation of 115 vertical tendons and 93 dome tendons, and has completed installation of field anchors and button-heading on 113 vertical tendons. Buttonheading and field anchor installation was in progress on the dome tendons. INRYCO was in the process of cleaning and greasing the horizontal conduits in preparation

for tendon installation. Acceptance criteria for post-tensioning activities are SP-207, the INYRCO Field Installation Manual, and INYRCO Drawing Numbers 675-1 through 675-20.

No items of noncompliance or deviations were identified.

7. Containment (Prestressing) - Review of Quality Records

The inspector examined quality records for fabrication of the following tendons: numbers CB33, BA33, AC33, CB37, BA37, AC37, CB41, BA41, AC41, CB45, BA45, AC45, CB49, BA49, AC49 and CB48. Acceptance criteria controlling tendon fabrication are those listed in paragraph 6.

No deviations or items of noncompliance were identified.

8. Exit Interview

The inspector met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection. The licensee was apprised of the scope of the inspection which included procedures, work performance and quality records for containment prestressing, review of service water pumphouse settlement records, and work performance on the service water pond dams.

No deviations or items of noncompliance were identified.

DETAILS III

Prepared by:

N. Economos
N. Economos, Metallurgical Engineer
Engineering Support Section
Reactor Construction and Engineering
Support Branch

11/24/78
Date

B. R. Crowley for
B. R. Crowley, Metallurgical Engineer
Engineering Support Section No. 2
Reactor Construction and Engineering
Support Branch

11/24/78
Date

Dates of Inspection: October 31 - November 2, 1978

Reviewed by:

T. E. Conlon
T. E. Conlon, Chief
Engineering Support Section No. 2
Reactor Construction and Engineering
Support Branch

11/24/78
Date

1. Persons Contacted

a. South Carolina Electric and Gas Company (SCE&G)

- *J. S. Algar, Nuclear Site Manager
- *M. Eddins, General Superintendent - Welding
- *H. Donnelly, Site QA Coordinator
- *D. Moore, Senior QA Engineer
- D. A. Nauman, Manager, QA
- *T. A. McAllister, QA Surveillance Specialist

b. Contractor Organization

Daniel Construction Company (DCC)

- *W. L. West, Project QA Manager
- *G. R. Curtis, Mechanical QA Supervisor
- *J. Harvey, Construction Manager
- J. J. Grabusky, Welding Manager
- D. Welker, Project Welding Engineer
- G. C. Garret, Jr., Project Training (Welding) Coordinator
- V. Cash, Project Welding Superintendent
- Q. Meares, Jr., Weld Test Shop Supervisor
- L. Sexton, QC Inspector - Welding

In addition to the above, other craft and inspection personnel were interviewed.

*Denotes those present at the exit interview.

2. Licensee Action on Previously Identified Inspection Findings

Previously identified inspection findings were not reviewed during this inspection.

3. Unresolved Items

There were no unresolved items identified as a result of this inspection.

4. Independent Inspection Effort

a. Welder Qualification and Training Program

The QA/QC procedures used to indoctrinate, qualify, and train newly hired and other project personnel within the welding discipline are as follows:

- AP-II-05 R6 - "Orientation, Introduction, and Training of Personnel
- QCP-II-01 R6 - "Qualification of Welding Procedures and Welders"
- WE-II-01 - "Qualification of Welding Procedures and Welders"

In addition DCC has written specific instructions to be used in the welder upgrading program, i.e. upgrading from carbon steel plate welding to X-Ray Pipe Welding. DCC stated that although the program for training and upgrading welders has been in existence for some time, it had never been documented until now.

Basically personnel with previous welding experience may take the standard performance qualification test as prescribed in Section IX, 1974 Edition of the ASME Code. Those with no experience are given the opportunity to practice until supervision is satisfied that the required level of expertise for qualification has been attained; DCC stated that this usually takes between six to eight weeks. Those candidates without experience receive oral and practical welder training at the training facilities located outside the gate where no testing is performed. All performance qualification tests are conducted inside the gate at the test shop. Qualified project welders who demonstrate good ability and

wish to upgrade from their present level, e.g., plate welding to carbon steel pipe welding or to stainless pipe welding, X-Ray quality, are given the opportunity to practice prior to taking the required test. In order to upgrade for X-Ray pipe welding, a qualified welder must weld 3 acceptable thin wall mockups consecutively and 2 acceptable heavy wall mockups consecutively for each material to be upgraded. In addition, welders who have upgraded to, but have not worked on X-Ray quality welds for a period of two weeks or more, are required to practice on a mock-up in the test shop prior to welding in the field. This program has been in existence, although not documented, for approximately one year. Presently there are about 33 to 35 welders qualified and upgraded to do X-Ray welding.

The inspectors reviewed the personnel and performance qualification records of approximately 20 X-Ray qualified welders; observed welders practicing and upgrading in the test shop; audited the welder training presentation designed to familiarize new personnel with weld material control, QA practices, weld test shop rules and regulations, shop safety and welder testing procedures; and reviewed welder performance (rejection rate) records.

b. Observation of Field Welding Activities

Fabrication, inspection and testing of field welds, within the reactor coolant pressure boundary and safety related systems, is controlled by Section III, 1971 Edition through the summer 1973 addenda of the ASME Code. In process and completed welds, selected at random, were inspected to verify compliance with code and procedural requirements. The welds selected were as follows:

<u>Weld No.</u>	<u>Size</u>	<u>ISO</u>	<u>Comments</u>
FW-18	32", C.S.	MS-08	Welding Fill Passes
FW-15C1	14", S.S.	SI-04	Root Closure in Progress
FW-21	14", S.S.	CS-04	Final Pass Completed
FW-1	3.5", S.S.	CS-89	Final Pass in Progress
FW-6C1	6.625", S.S.	SE-SI-20	Fitup in Progress
FW-1	10.75", C.S.	DE-1A-319-P	Root Closure in Progress
FW-4	6.625", S.S.	SI-19	Final Fill Passes in Progress
FW-10	3", S.S.	SP-03	Completed
FW-3	6.625", S.S.	SI-20	Root and Hot Pass Completed
FW-9	10.75", S.S.	SP-16	Completed
FW-19	10", S.S.	SP-16	Completed

These welds were inspected for proper fitup, bead contour and appearance, arc strikes, cleanliness, purge as applicable, identification, location and position. Related QA/QC records including

welder qualification cards, weld data cards, weld metal slips and isometric drawings were reviewed for completeness and accuracy. In addition, selected radiographs were reviewed for weld quality and obvious radiographic quality problems. These were:

<u>Weld No.</u>	<u>ISO</u>	<u>Size</u>
FW-7C1	SP-04	3" X .438"
FW-1C1R2	SP-17	3" X .438"
FW-15	SI-09	3" X .438"
FW-5C1	SI-09	3" X .968
FW-10	SI-34	12" X 1.125"
FW-12	SI-34	12" X 1.125"
FW-7R1	RC-06	4.5" X .531"
FW-3R1	SI-22	6" X .719"
FW-5	SI-22	6" X .719"
*FW-4R2	SW-24	16" X .375"

*Repair of this joint not complete at time of inspection.

c. Plant Tour

The inspectors walked through various areas of the plant to observe certain pipe handling installation and other welding activities in progress. Housekeeping and availability of fire protection equipment were noted. Working areas were inspected for uncontrolled welding electrodes.

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

5. Exit Interview

The inspectors met with licensee representatives denoted in paragraph 1 at the conclusion of the inspection and summarized the scope and findings of the inspection. The inspection included observation of field pipe welding activities and examination of welder qualification and training program. The licensee had no questions or comments.