

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report No. 99900047/81-01

Program No. 51300

Company: Westinghouse Electric Corporation
Nuclear Components Division
Post Office Box 19218
Tampa, FL 33686

Inspection Conducted: May 4-8, 1981

Inspectors:

L. E. Ellershaw
L. E. Ellershaw, Contractor Inspector
Reactive Inspection Section
Vendor Inspection Branch

6-29-81
Date

D. G. Breaux
D. G. Breaux, Contractor Inspector
Reactor Systems Section
Vendor Inspection Branch

6-30-81
Date

Approved by:

I. Barnes
I. Barnes, Chief.
Reactive Inspection Section
Vendor Inspection Branch

6-30-81
Date

Summary

Inspection conducted May 4-8, 1981 (Report No. 99900047/81-01)

Areas Inspected: Implementation of 10 CFR Part 50 Appendix B criteria, and applicable codes and standards including; review of vendor's activities; follow-up on a 10 CFR Part 50.55(e) report; welding material control; manufacturing process control; control of nonconformances; design process management, and previous inspection findings. The inspection involved 61 inspector-hours on site by two NRC inspectors.

Results: In the seven areas inspected, two nonconformances and no unresolved items were identified.

Nonconformances: Weld Material Control - Welder identity was not recorded and either the wrong welder or the wrong welding material was entered on the QC Weld Log (Notice of Nonconformance, Item A.).

Manufacturing Process Control - Completed operations were not signed-off, and in-process and completed operations were not performed in accordance with the Feeder Traveler requirements (Notice of Nonconformance, Item B.).

DETAILS SECTION I

(Prepared by L. E. Ellershaw)

A. Persons Contacted

- *L. Conway - Manager, Heat Exchanger Engineering
- C. L. Doriel - Supervisor, Receiving and Material Handling
- *R. H. Dunn - Supervisor, QA Records
- R. L. Frohlich - Process Engineer
- R. E. Lambert - Process Engineer
- L. Malizia - Process Engineer
- *T. D. Miller - Manager, Product Assurance
- *J. P. Mortara - Manager, Quality Assurance
- P. M. Parker - Quality Assurance Engineer
- J. A. Powell - Supervisor, Quality Control

*Denotes those persons attending exit meeting.

B. Action on Previous Inspection Findings

1. (Closed) Item Requiring Follow-up Inspection, Details Section I, paragraph C.3.c.(1) (Report No. 79-02): This item dealt with a conflict between Tampa Quality Assurance Instruction 1.4.1 and the QC welder log and Patrol Inspection form pertaining to the recording requirements of preheat and interpass temperatures, and the location for measurement of interpass temperature.

TQAI 1.4.1 was superceded by Product Assurance Instruction, PAI 502(T) Revision 0, dated November 26, 1980. PAI 502(T) requires verification of interpass temperature on the deposited weld metal immediately prior to welding the next pass, and verification of minimum preheat temperature on base metal within T/2 inches adjacent to the seam or weld (where T=base metal thickness).
2. (Closed) Item Requiring Follow-up Inspection, Details Section I, Paragraph C.3.c.(2) (Report No. 79-02): This item dealt with a process specification, 8111 LA Issue 2, providing a non-mandatory table of recommended parameters for use in automatic arc air gouging. Paragraph 9.2 of the process specification states, "There are no requirements. The exact technique to be employed will depend on the nature of the job, the operator's skill, experience, and judgement." The procedure was developed for use as a guide only. After all air arc gouging is performed, the areas are ground and magnetic particle examination is performed.

3. (Closed) Item Requiring Follow-up Inspection, Details Section I, paragraph D.3.c (Report No. 79-02): This item dealt with control of electrode rebaking practice relative to verification of compliance with paragraph NB-4642.3, sub-paragraph (4) in Section III of the ASME Code.

WTP implemented Process Specification No. 82121XN, "Bead Temper Repairs to ASME Section III," dated June 20, 1980. Paragraph 2 states in part, "Repairs to base metal without required postweld heat treatment . . . No recycled/rebaked electrodes allowed under this technique. Use only new electrodes which have been baked in accordance with Process Specification No. 8305RM" Process Specification 8305RM provides requirements which parallel those stipulated in ASME Section III, paragraph NB-4642.3.

4. (Open) Item A, Notice of Deviation (Report No. 80-03): This item dealt with qualification of shell forming and procurement provisions for plate, not being accomplished in accordance with requirements of Section III of the ASME Code.

WTP has ordered three heats of 4" thick SA-533, Grade A, Class 2 plate material, 92" wide x 102" long. The full series of ASME Section III required tests will be performed. The material is not expected to be received until July 1981, with subsequent testing being performed in August 1981.

5. (Closed) Item B, Notice of Deviation (Report No. 80-03): This item dealt with quality trend reports not being issued on a monthly basis.

WTP revised the QA Program Manual to delete the monthly requirement. In practice, meetings are held on a quarterly basis with 1 MRRs being reviewed to determine any trend analysis, with a report being issued based on the review.

C. Review of Vendor's Activities

The following information pertains to current contracts and the scheduled location that the work is to be performed (Tampa or Pensacola), during the phasing out of nuclear work at the Tampa Plant.

1. Georgia Power Company's Alvin W. Vogtle, Jr., Nuclear Plant
 - (a) Unit 1: Four steam generators scheduled for completion and are to be shipped from Tampa (two in August and two in September 1981).
 - (b) Unit 2: The lower and upper assemblies of four steam generators will be fabricated in Tampa, then transferred to Pensacola for the welding of the Z seams and closure seams during the first half of 1982.

The one pressurizer will be shipped complete from Tampa in November 1981.

2. Public Service Company of New Hampshire, Seabrook Nuclear Station, Unit 2: Four steam generators are to be shipped complete from Tampa (two in October and two in November 1981), and one pressurizer to be shipped complete from Tampa in October 1981.
3. Wisconsin Power and Light Company's Point Beach Nuclear Plant: Two lower steam generator assemblies are scheduled for fabrication in Pensacola starting in the first quarter of 1982, with shipment scheduled at the end of 1983.
4. Union Electric Company's Callaway Plant, Unit 2: This contract is currently on hold; however, the complete fabrication of the four steam generators and one pressurizer would take place in Pensacola.

D. Follow up on A 10 CFR Part 50.55(e) Report

1. Introduction

The initial report from TVA was made to Region II of the Office of Inspection and Enforcement on October 23, 1979, pertaining to surface cracks in the loop one steam generator in Watts Bar Nuclear Plant, Unit 1.

2. Objectives

The objectives of this area of the inspection were to determine the generic implications and to verify that WTP has taken the steps to assess, correct, and preclude recurrence of the problem.

3. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of the final 10 CFR Part 50.55(e) report from TVA, dated January 8, 1981.
- b. Review of fabrication data pertaining to the steam generator.
- c. Review of WTPs evaluations.
- d. Discussion with cognizant personnel.

4. Findingsa. Nonconformances

None

b. Unresolved Items

None

c. General

The cracks were discovered during ultrasonic examination which was being performed as part of the preservice examination of structural welds. The indications were in areas where temporary attachments had been installed during fabrication, on the inside and outside surfaces near the vessel shell to upper head girth weld.

The indications have been removed by grinding to a maximum depth of 0.190", which does not violate the minimum wall thickness. Subsequent nondestructive examinations showed the repaired areas to be acceptable.

The Watts Bar Unit 1 steam generators were shipped by WTP in March and May 1975. At the time of fabrication, records were not required showing location of temporary attachments or base metal repairs by welding where the depth of excavation did not exceed the lesser of 3/8" or 10% of the section thickness. The required nondestructive examinations, after removal of temporary attachments or the completion of the above base metal weld repairs, consisted of either magnetic particle or liquid penetrant examinations. WTP has attributed these cracks to delayed hydrogen cracking which is a result of hydrogen entrapment during the welding process.

TVA's preservice inspection program should detect this condition, but only in the areas of structural welds. Because WTP did not record areas of temporary attachments or minor base metal repairs, this condition could exist in areas not covered by the preservice inspection program. In an effort to eliminate this concern, Westinghouse performed an analysis which assumed hydrogen cracking would occur in the highest stress area of the vessel. The conclusion was that the worst case hydrogen crack condition would not jeopardize vessel integrity. The worst case condition was based upon recorded sizes of hydrogen cracks observed in other WTP steam generators, dating back to 1974. The results indicated that the two most probable areas of concern are the tubesheet/stub barrel weld, and the lower shell/cone weld.

The NRC inspector reviewed the WTP fabrication and magnetic particle examination (MT) history, which reflects changes that WTP has made, in an effort to reduce the potential for, and increase the detection of, delayed hydrogen cracking. The fabrication changes include: Increased preheat temperatures (1977); increased electrode baking temperatures (1975), and reduction in exposure time of electrodes (1977). The changes in MT include: Examination of temporary attachment areas before and after postweld heat treatment (1979), and examination of all weld areas before and after postweld heat treatment (1980).

E. Welding Material Control

1. Objectives

The objectives of this area of the inspection were to verify that WTP had implemented the requirements for the control of welding material in accordance with the QA Program Manual and applicable NRC and ASME Code requirements.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of QA Program Manual Section 8.3, "Control System for Welding Materials."
- b. Review of Standard Division Procedure PQ3-006.4, "Weld Material Control."
- c. Review Certified Material Test Reports of 11 heats of weld wire/electrodes.

- d. Review wire/flux qualifications of 12 different combinations.
- e. Review of Weld Material/Welder Logs.
- f. Review of QC Weld Logs.
- g. Observation of electrode holding ovens.
- h. Discussions with cognizant personnel.

3. Findings

a. Nonconformances

See Notice of Nonconformance, Item A.

The Weld Material/Welder Log (WM/WL) acts as a weld material requisition and shows the welder's name, identity code, electrode size, type, quantity, test number, and time out and time in. The Quality Control Weld Log (QCWL), which serves as a basis for permanent weld history records, shows the item being welded, date, inspector, welding process, electrode type, size, and test number, flux and welder qualification number.

The WM/WL for the third shift on May 5, 1981, Section B800, showed Welder BL being issued 20, 1/8" Inconel electrodes, Test No. T08477, for bead temper repairs. It further showed welder JA being issued 22, 3/32" Inconel electrodes, Test No. T07647, for bead temper repairs. A review of the applicable QCWL showed that welder JA performed bead temper repairs using 1/8" Inconel electrodes, Test No. T08477 and not welder BL. This work was performed on the steam generator for Millstone Unit 3.

The WM/WL for the first shift on May 4, 1981, Section B600, shows the following: welder FG received 25, 5/32" type 9018 electrodes and 30, 5/32" type 7018 electrodes; and welder JU received a total of 46, 1/4" type 9018 electrodes. Neither of these welders are identified in the applicable QCWL as having performed welding. The Section Supervisor stated that welder JU had performed welding on the ID of the Z seam of the Georgia Power Steam Generator. It could not be determined at this time what welder FG had performed welding on.

The WM/WL for the third shift on May 5, 1981, Section B600, had two entries for welder HN. The first entry showed he received 15, 5/32" Inconel electrodes, Test No. 10787. The second entry showed he received six, 3/32" Inconel electrodes (wire) Test No. 7979. The applicable QCWL identified welder HN, as welding with 5/32" Inconel electrodes only.

The WM/WL for the third shift on May 4, 1981, Section B800, showed welder SD receiving 12, 3/16" type 9018 electrodes. A review of the applicable QCWL showed that welder SD was not identified as having performed any welding.

While it is true that the QCWL is used to reflect a history of welding performed on Code items, the fact that errors do exist, precludes assurance that a welder will be identified on the QCWL if he welded on a Code item.

b. Unresolved Items

None.

F. Manufacturing Process Control

1. Objectives

The objectives of this area of the inspection were to verify that WTP had implemented the requirements for the control of manufacturing processes in accordance with the QA Program Manual and applicable NRC and ASME Code requirements.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of QA Program Manual Section 9.0, "Control of Construction Processes."
- b. Review of Feeder Travelers and related documentation to assure that the required operations had been performed in accordance with those requirements.
- c. Observation of in-process welding to assure that it conformed with the feeder traveler requirements.
- d. Discussions with cognizant personnel.

3. Findings

a. Nonconformances

See Notice of Nonconformance, Item B.

The feeder traveler for Shop Order GBGT 1984, Steam Outlet Nozzle Clad and Machine, assigned Item AAC02, Operation 13, required "Auto Mig Weld Cladding Per PSI." Observation of

the in-process welding showed the welder (NW) to be performing manual, shielded metal arc welding with 5/32" Inconel electrodes. A review of the QCWL dated May 7, 1981, showed that the QC technician recorded the fact that manual SMAW was being performed.

This reflects either failure to weld in accordance with Feeder Traveler requirements or failure to change the Feeder Traveler to reflect actual operation performance.

The Feeder Traveler for Shop Order GBGT 1982, Upper Shell Barrel Core End, assigned Item AAA, operations 115 and 116, required "Set up" and "Weld OD of Feedwater Nozzle to Barrel."

Review of the QCWL showed that the welding had been accomplished on April 30, 1981, but the operations on the Feeder Traveler had not been signed off as of May 7, 1981.

The Feeder Travelers for Shop Orders KSGT 4011 and 4012, "Repair PT Indications in Cladding," Assigned Item AAC02, Operations 13 and 14 are the same, in that they required the following:

Operation 13: "Auto Mig Weld Cladding per PSI"

- Step 1. "Check All Gas Fittings for Tightness."
- Step 2. "Check Coolant Pump Operations for Proper Constant Flow."
- Step 3. "Check Wire Feed."
- Step 4. "Check Wire Spool Tension."
- Step 5. "Check Oscillation and Travel Rate."
- Step 6. "Check Nozzle for Cleanliness."

Operation 14: "Check and Record Preheat and Welding Until Complete."

Both operations had been signed-off as having been accomplished in accordance with these requirements by the QC Technician on February 11, 1981.

However, a review of the applicable QCWL showed that welding was performed in accordance with PSI 8212 UW, which is SMAW process for Inconel overlay (P43) to P3 material, rather than the specified GMAW process.

G. Control of Nonconformances

1. Objectives

The objectives of this area of the inspection were to verify that WTP had implemented the requirements for identifying and controlling nonconforming material in accordance with the QA Manual and applicable NRC and ASME Code requirements.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of QA Program Manual Section 15.0, "Nonconforming Items."
- b. Review of Standard Division Procedure PQ6-001.1, "MRR Procedure."
- c. Review of the latest MRR Status Report dated May 4, 1981.
- d. Review of seven open MRRs and observation of the components which were identified as being nonconforming.
- e. Review of the Feeder Travelers associated with the nonconforming item to assure that the MRRs were identified on the traveler and that a copy of the MRR was included in the package.
- f. Discussions with cognizant personnel.

3. Findings

a. Nonconformances

None

b. Unresolved Items

None.

H. Exit Interview

The scope and findings of this inspection were summarized at the conclusion of the inspection on May 8, 1981, with the following management representatives:

J. Divens - Manager, Operations
 N. J. Georges - Manager, Division Engineering
 R. H. Hedgepeth - Manager, Program Management
 R. L. Sylvester - Design Engineer

Additional attendees are identified in Paragraph A.

Management acknowledge the statements made by the NRC inspectors and had no specific questions regarding the findings as presented to them.

DETAILS SECTION II

(Prepared by D. G. Breaux)

A. Persons Contacted

R. H. Dunn - Supervisor QA Records
J. Mortara - QA Manager
R. L. Sylvester - Design Engineer

B. Action on Previous Inspection Findings

1. (Closed) Deviation (Item C.2., Notice of Deviation, Inspection Report No. 80-02): Manufacturing on Shop Order No. XART 3094, Item AAD, Mid-Deck Plate, was not performed in accordance with approved work instructions.

The NRC inspector verified that the committed corrective actions had been performed pursuant to Westinghouse Tampa Plant response to this specific deviation. Material Transfer Request (MTR) No. 0175 dated September 15, 1980, was initiated and included in the XART 3093 and 3094 feeder travelers. Engineering Change Notice (ECN) No. 5078 was completed and entered into the WTP Drawing Control System. Drawing No. 1513E87, Revision 3, dated August 29, 1980, was reviewed by the NRC inspector. Drawing Change Release (DCR) D-00798 dated August 29, 1980, referenced ECN No. 5078 as the document that initiated Revision 3 to Drawing 1513E87. The Mid-Deck Plates were inspected to Drawing 1513E87, Revision 2, and Material Review Reports (MRR) No. 035919, and 37046 were written identifying the drawing to part deviation on XART 3093 and 3094 feeder travelers. Procedure PQ2-001, "Drawing Control Procedures," Revision 3, dated February 26, 1981, was revised to designate Engineering Drafting responsibility for Drawing Change Release (DCR) to insure proper drawing distribution. A training session was held on October 3, 1980, in which all Manufacturing Planning Engineers and their management reviewed the revision to PQ2-001 and coordinated responsibility changes.

2. (Closed) Deviation (Item C.3, Notice of Deviation, Inspection Report No. 80-02): A copy of the release document for Drawing 1513E87, Sub. 3, which had been received by the Reproduction Center on August 29, 1980, had not been sent to Product Assurance as of the inspection date of September 12, 1980.

The NRC inspector verified that the committed corrective actions had been performed. Copies of Drawing Change Release (DCR) D-00798 dated August 29, 1981, had been distributed to Production Planning and Product Assurance and are currently on file. Procedure PQ2-001, "Drawing Control Procedures," Revision 3, dated February 26, 1981, was revised to designate Engineering Drafting responsibility for distribution of DCRs to insure proper drawing distribution. The

DCR file was reviewed to identify any open DCRs. Action required by open DCRs was reviewed and completed as of this current inspection. A training session was held on October 3, 1980, in which all Manufacturing Planning Engineers and their management reviewed the revision to PQ2-001 and coordinated responsibility changes.

3. (Closed) Unresolved Item (Item I.C.3.b, Inspection Report No. 80-03): The QA Records Material Review Report (MRR) Log is specified as being the means to document the issuance and ultimate close-out of an MRR. In certain cases, the QA Records MRR Log did not show the issuance and/or close-out of an MRR.

Sequential lots of unprocessed MRRs are issued and logged to certain groups from the MRR Room. On a weekly basis, QA goes to the MRR Room Log Book and checks the physical status of the issued MRRs. This review is also compared against the QA records MRR logs and correction is performed if needed. On a weekly basis, a list of undispositioned MRRs is distributed to the Design Engineer Manager, QA Manager, and Manufacturing Manager for expediting purposes. The uncontrolled computer printout referred to in the text of the 80-03 inspection report, was explained to be a tool for trend analysis and budgetary purposes and not as an up to date MRR status reflection.

C. Design Process Management

1. Objectives

The objectives of this area of the inspection were to examine the establishment and implementation of quality related procedures for the design process to verify that:

- a. The design process system is defined, implemented, and enforced in accordance with approved procedures, instructions, or other documentation for all groups performing safety-related design activities.
- b. Design inputs are prescribed and used for translation into specifications, drawings, instructions, or procedures.
- c. Appropriate quality standards for items important to safety are identified, documented and their selection reviewed and approved.
- d. Final design can be related to the design input with this traceability documented, including the steps performed from design input to final design.
- e. Design activities are documented in sufficient detail to permit design verification and auditing.

- f. The methods are prescribed for preparing design analyses, drawing, specifications, and other design documents so that they are planned, controlled, and correctly performed.

2. Method of Accomplishment

The preceding objectives were accomplished by review of:

- a. Westinghouse Nuclear Components Division, Quality Assurance Program Manual.
 - (1) Section 3.0, "Design Control," Revision 1, dated March 18, 1981.
 - (2) Section 6.0, "Document Control," Revision 1, dated March 18, 1981.
- b. Westinghouse Nuclear Equipment Engineering Department Procedures Manual.
 - (1) EP 6.0 "Transmittal and Control of Technical Information," Revision 1, dated October 1, 1980.
 - (2) EP 7.0, "Design Specification," Revision 1, dated October 1, 1980.
- c. Westinghouse, Tampa Engineering Instruction Manual EI-001, "Engineer Quality Assurance Document Retention," Revision 0, dated February 9, 1981.
- d. The following documents to assure that procedural requirements are being properly and effectively performed:
 - (1) Shop Order File No. GBGT 1981-84 Georgia Power - Alvin W. Vogtle Unit No. 2 Steam Generators.
 - (2) Manufacturing Order Transmittal (MOT) GO No. AT-68552.
 - (3) MOT/Change Notice No. 20, 21, 22 (Incorporation of Interim Revisions to General E-Specification No. 953236, Revision 0.).
 - (4) E-Specification Review and Approval Log.
 - (5) Two Document Submittal Forms
 - (6) Document Applicability Form (DAF)
 - (7) Applicable Documents List (ADL) For Shop Order GBGT 1981, dated April 9, 1981.

- (8) Four Equipment Specifications and Interim Revisions.
- (9) Westinghouse System Standard 1.3.F Revision 0, dated March 1978, "NSSS Reactor Coolant System Design Transients for Standard Plants with Model F Steam Generators."
- (10) Westinghouse Proprietary Class 2, Design Power Capability Parameter Manual.
- (11) Five Engineering Drawings with Associated Drawing Change Release (DCR) and Engineering Change Notice (ECN).
- (12) WTP-ENG-81-016 entitled "Model F Steam Generator Thermal-Hydraulic Data Report."
- (13) Model F Series 84 Pressurizer Stress Report for Standard Nuclear Unit Power Plant Systems (SNUPPS), Callaway Nuclear Power Station Unit 1, WNET-138 (SCP), Volume 1 dated December 1980.

3. Findings

- a. Within this area of inspection, no nonconformances or unresolved items were identified.
- b. Item Requiring Further Inspection

QA Program Manual Section 3.0, paragraph 3.3 states, "Manufacturing order information is furnished by the customer through the Program Management Department to the Engineering Department through use of the Manufacturing Order Transmittal." Section 5.0, paragraph 5.2.3 further states, "Manufacturing Order Transmittal and Manufacturing Order Transmittal Change Notice provide the design specification that contains what must be accomplished on each job and provide the basis for generation of design manufacturing and inspection documents."

Review of Manufacturing Order Transmittal Change Notice No. 10 to Shop Order No. SCPT-2241 showed the incorporation of interim Revision 3 to Equipment Specification 676440 on March 16, 1981. The applicable specification revision was not transmitted, however, by the customer (Westinghouse NT) concurrent with the Change Notice and a copy was not in the possession of Westinghouse, Tampa as of this inspection.

In the absence of referenced information the Change Notice does therefore not provide the basis for generation of necessary design manufacturing and inspection documents.

The NRC inspector was unable to ascertain that any QA programmatic requirements existed in regard to transmittal of manufacturing information by the customer, Westinghouse NTD. A further inspection of this subject will be performed at Westinghouse NTD, in order to establish compliance with QA program requirements for control of design interfaces.