ORGANIZATION: SOUTHWESTERN ENGINEERING COMPANY
JOPLIN, MISSOURI

REPORT NO.: 99901083/87-01	INSPECTION DATES: 04/06-08/87	INSPECTION ON-SITE HOURS: 24

CORRESPONDENCE ADDRESS: Southwestern Engineering Company
ATTN: Mr. Nick Capra
General Manager
Post Office Box 13851
Joplin, Missouri 64801

ORGANIZATIONAL CONTACT: Arnold Davis, QC Manager
TELEPHONE NUMBER: (417) 782-5080

NUCLEAR INDUSTRY ACTIVITY: Mositure separator reheaters (MSR) and condensers.

ASSIGNED INSPECTOR: J. T. Conway 6-29-87
J. T. Conway, Program Development and Reactive Inspection Section (PDRIS) Date

OTHER INSPECTOR: T. Tinkle, Consultant

APPROVED BY: J. T. Conway 6-29-87
for J. G. Stone, Chief, PDRIS, Vendor Inspection Branch Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was made to conduct a programmatic evaluation of the implementation of the QA program pertaining to the modifications made by Southwestern Engineering Company (SEC) of MSR internals at Virginia Power Company's (VPC) North Anna and Surry nuclear facilities.

PLANT SITE APPLICABILITY: North Anna 1 and 2 (50-338/339) and Surry 1 and 2 (50-280/281).

A. VIOLATIONS:

None.

B. NONCONFORMANCES:

None.

C. UNRESOLVED ITEMS:

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

None. This was the first inspection at this facility.

E. OTHER FINDINGS AND COMMENTS:

1. SEC

During various discussions, the SEC Quality Control (QC) Manager provided background and other information concerning SEC's facilities and nuclear business involvement. A brief summary follows: SEC designs and fabricates large and high pressure heat exchanger equipment for the petro-chemical and electric power generating industry. Over the past twenty years, the company's principal business activities have involved design and manufacture of MSRs, feedwater heaters (FWH), and steam surface condensers. SEC produces equipment for both fossil and nuclear electric generating plants. SEC's corporate office, including the corporate staff, engineering, and long lead procurement activities are located in the City of Commerce, California. The corporate office is also responsible for contract administration for on-site installation work performed by SEC. SEC has two plants in Joplin, Missouri. An older plant engaged in manufacturing condensers is located at 11th and Wall Street. A new plant located on 9th Street is engaged in manufacturing equipment such as pressure vessels, MSRs, and FWHs. SEC also has a facility located in Burlin, Wisconsin and a field service office in Florence, Kentucky. The Wisconsin facility is planning on getting an "N" stamp for Section III ASME Code work.

Prior to 1983 SEC's manufacturing plant was located at its corporate headquarters in California. In 1983 the California manufacturing capability was moved to the 9th Street plant in Joplin. SEC maintains the Joplin plant at 11th Street and Wall, but it is currently closed due to insufficient work volume. The new Joplin facility started operating in mid 1983. The facility qualified for and obtained "N" and "NPT" stamps for ASME Section III work. Since SEC did not receive any orders for ASME Section III Code work, they decided not to renew the stamps when they expired in December 1986. To date, the new Joplin plant has "U," "S" and "R" stamps and has only manufactured ASME Code components to Section VIII. Purchase Order (PO) 79-5721-12 from Duke Power Company placed in 1979 was the last customer order for ASME Section III Code equipment. The order was for fuel pool cooling heat exchangers which were manufactured at the California plant. Job order files and records for all manufacturing work done at the California plant are maintained in California.

2. QC Manual

Various sections of SEC's QC Manual, Revision 1, dated February 20, 1987 were reviewed. The QC Manual contains a description of the QA program intended to meet the requirements of Section VIII "Pressure Vessels" Division 1 and Section I "Power Boilers" of the ASME Code and the National Board Inspection Code, Edition 4, Revision 1. The QC Manual is applicable for work conducted at both of SEC's facilities located in Joplin. It was noted that NDE personnel and welders are qualified to SNT-TC-1A and Section IX of the ASME Code, respectively.

3. Domestic Nuclear Customers

A summary of the 85 MSRs fabricated by SEC (Joplin) to the requirements of Section VIII of the ASME Code from 1983 to the present for domestic nuclear customers follows:

Job No.	Customer	Date Shipped
82-28-11 thru 14	Wisconsin Electric (Point Beach)	9-83
83-26-01 thru 04	Rochester Gas & Electric (Ginna)	3-84
83-44-01 thru 04	Baltimore Gas & Electric (Calvert Cliffs)	4-84

Job No.	Customer	Shipped
83-52-01/02	Connecticut Yankee (Haddam Neck)	7-84
84-22-01 thru 04	Virginia Electric (North Anna)	8-84
84-16-02 thru 05	Virginia Electric (Surry)	9/10-84
84-20-01 thru 04	Virginia Electric (Surry)	12-84
85-11-01 thru 12	TVA (Sequoyah)	8/9-85
85-11-21 thru 32	TVA	12-85/1-86
84-42-01 thru 06	Public Service Electric & Gas (Salem)	2/3-86
85-27-01/02 and 11/12	TUGCO (Comanche Peak)	3/7-86
86-21-01	Public Service Electric & Gas (Salem)	8-86
86-14-01 thru 08	Duke Power (Oconee)	10/11/12-86
86-10-01 thru 08	Florida Power (Crystal River)	1/3-87
86-24-01 thru 04	Portland General Electric (Trojan)	3-87
86-31-05 thru 08	Westinghouse (WPPSS)	4-87

A summary of the seven condensers fabricated by SEC (Joplin) to the requirements of Section VIII of the ASME Code from 1983 to the present for domestic nuclear customers follows:

Job No.	Customer	Date Shipped
6750	Houston Power & Light (South Texas)	10-83
84-3510	Virginia Power	10-85
84-3520	Virginia Power	1-86
85-2810/2820	TUGCO (Comanche Peak)	4/6-86
85-2610/2620	TUGCO (Comanche Peak)	6/11-86

The inspector selectively reviewed job files for 13 replacement MSR tube bundles and components. The orders included Job Nos. 84-22-02, 84-16-05, 84-22-01, 82-28-13, 86-14-01, 86-31-06, 86-24-01, 86-10-05, 83-44-04, 83-52-02, 85-27-12, 84-42-01, and 85-11-06. Each file contained a technical specification which, among other things, listed applicable codes and standards (e.g., Section VIII for design and manufacture, Section IX for welding, Section II-Part A for materials, and Section V for NDE and SNT-TC-1A for examiners) and gave the requirements for a documented QA program. In many cases the customer would install the replacement tube bundle with SEC providing engineering technical assistance support, but in others SEC would be responsible for removing and installing the new MSR components.

The files included a Traveler/Inspection Plan and Record for the tubesheet, bundle, head, tubing and final assembly; copies of drawings marked with a QA stamp; Bill of Materials; Procedures List; CMTRs from tubing and weld material manufacturers; nonconformance/corrective action reports; magnetic particle, liquid penetrant, ultrasonic and hydrotest reports; inspection reports; radiographic weld maps and reader sheets; heat treatment charts; and shipping papers. In addition, QA documentation packages to the customer included Form U-2 Manufacturer's Partial Data Report, CMTRs, Leak Testing Report (tube to tubesheet joints), NDE and hydrotest reports; and SEC certifications that all material complies with Section II of the ASME Code, MSR components comply with Section VIII, and the unit was hydrotested in accordance with the specification requirements.

It was noted that heat treatment charts dated June 25, 1986 and July 15, 1986 for Job No. 85-27-12 did not identify the affected component on the chart which does not agree with the requirements in Section 8.1 "Heat Treatment Systems Control" of the QC Manual.

5. MSR Modifications

The NRC inspector reviewed the records retained at SEC's Joplin facility for the MSR internals supplied to North Anna (Job No. 84-22-01 thru 04) and Surry (Job No. 84-16-02 thru 05 and 84-20-01 thru 04). A review of the documents (specific types identified in Section D3 of this report) indicated that the MSR internals were designed, manufactured, and tested to the requirements of Section VIII of the ASME Code and shipped to the North Anna site in August 1984 and the Surry site in September, October, and December 1984.

During the week of the inspection, copies of VPC POs and contract documents were received from SEC's corporate offices in California. PO Nos. ET-41600-SC and ET-41586-SC for Surry and ET-41603-SC for North Anna were issued to SEC for materials and engineering services. Each PO contained several attachments. Attachment IB "VEPCO Special Terms and Conditions for Nuclear Work" (STC 1-STC 13) was dated February 18, 1983 and was included in each PO. Section II of Attachment IB stated that the provisions of 10 CFR Part 21 may be applicable to the work performed, and the supplier shall comply with the requirements of 10 CFR Part 21 to the extent applicable. Section III of Attachment IB stated

that the supplier shall adopt and implement a QA program that meets all NRC requirements including 10 CFR Part 50, Appendix B. Attachment IIA referenced the technical specification for each project.

In a review of SEC documentation packages sent to VPC, it was noted that SEC did not take any exception to the requirements of the POs or specifications as referenced in Certificate of Compliances signed and dated October 17, 1984 (Job No. 84-16-05) and August 23, 1984 (Job No. 84-22-01) by the QA Manager or equivalent.

Contract Nos. PSC-C-0184704 and FHN-378-0228 were between VPC and SEC for MSR modifications at Surry, Unit Nos. 1 and 2 and North Anna, Unit Nos. 1 and 2, respectively. The scope of work in each contract was for SEC to provide services and materials for the removal and installation of the new MSRs at both nuclear sites. Section 5 of PSC-C-0184704 and Section 3 of FHN-378-0228 addressed the applicability of 10 CFR Part 21, and both stated in part, "Contractor understands that the provisions of the Title 10 Code of Federal Regulations (CFR) Part 21 apply to this contract."

In discussions with the QC Manager, the NRC inspector was told that installation activities performed at nuclear sites are administered by SEC's corporate office. For the Surry and North Anna projects, SEC subcontracted to Powerplant Specialists (PS) to perform the installation activities. It was also stated that SEC is responsible for providing the qualified welding procedures and for qualifying the welders. All the records related to the on-site installation activities are maintained in the corporate office in California. These records include welding procedure specifications, procedure qualification records, and welder qualification tests.

A future inspection of the SEC and PS facilities in California will include a review of welding records.

6. Nondestructive Examination (NDE)

The NRC inspector reviewed Sections 7.1 and 7.2 of the QCM, eight NDE procedures, and the qualification records for nine NDE personnel. Procedure AS-QA-1.5 "Written Practice for Certification of NDE Personnel" documented SEC's qualification/ certification program. The four procedures addressing magnetic

particle, radiographic, ultrasonic and liquid penetrant testing were prepared by a Level III examiner and were approved by the QC Manager who is also certified to a Level III. In general, the type of information found in the record files for the nine NDE personnel (four -Level III and five -Level II) included: educational background, resumes, certificates of training completed, record of qualification, certification statements, examinations (general, specific, practical) and eye exams. It was noted that an eye exam for individual SECO 16 was not dated, and a signature and date were missing for an eye exam for individual SECO 19. The qualification records appeared to satisfy the requirements of SNT-TC-1A with the exception that the records did not contain a statement indicating that each NDE personnel had satisfactorily completed training in accordance with Procedure AS-QA-1.50.

7. Calibration of Measuring & Test Equipment (M&TE)

The inspector reviewed records for M&TE and certifications for reference standards used by service vendors to calibrate M&TE. An observation of M&TE at various work stations was also performed to assure that M&TE are properly identified, controlled and calibrated at specified intervals. The M&TE selected for review include the following, identified by serial number (S/N): two MT (P-90) (33 and 80567), pressure gauge (42), five temperature gauges (113, 137, 152, 155, and 156), Sonotest (UFD-7) (7119), torque wrench (12425), tong tester (AX46503), amp probe (AX53099) and two temperature recorders (HR5-052374-1 and MDH-8325-3642).

It was noted that temperature gauge (137) was calibrated by Tulsa Gauge and Instrumentation. NDT Technology calibrated the Sonotest UT instrument, and General Testing Laboratory calibrated the torque wrench. The amp probe and tong tester were calibrated by Agra Engineering. Calibration of the MT (P-90) (80567) was performed by Venture, and the two temperature recorders were calibrated by Honeywell. Certification records do not reflect traceability of calibration standards used for some instruments (e.g., S/Ns 137, 12425, 80567, HRS-052374-1, MDH-8325-3642-F051). Documentation was not available to indicate the traceability requirements contained in Procedure AS-QA 1.60 "Instrument and Gage Calibration" are being met in these cases.

Gaps were observed between the calibration due dates and the actual calibration dates for some instruments (e.g., S/Ns 42, 113, 137, AX53099). This was discussed with the SEC Quality Engineer responsible for calibration. He stated that if instruments are not recalibrated prior to the calibration due date, they are removed from service and kept in his office. There was no documentation to indicate that the requirements for tagging and segregation contained in Section 7.3 "Instrumentation and Gage Calibration" of the QC Manual are being met in these cases.

There was no recent documentation to indicate that the requirements contained in Section 7.3 of the QC Manual and Procedure AS-QA 1.60 are being met with respect to performing surveys of calibration vendors (e.g., Venture for S/N 80567). According to the calibration records and calibration frequency requirements contained in procedure AS-QA 1.60, the Sonotest UT instrument (S/N 7119) has been overdue for outside calibration for over six months. It was further noted that SEC only has one of these instruments.

The five temperature gauges were being used on drying ovens in the weld material storage area. Procedure AS-330 "Storage and Handling of Shielded Metallic Arc Electrodes" requires that stainless steel, nickel base, and cooper base electrodes be stored in a holding oven between the temperature range of 100°F to 125°F; and low hydrogen, mild steel and low alloy electrodes be stored in holding ovens at 150°F. All five ovens were operating at high temperatures based on the gauge readings of 180, 178, 168, 166 and 162°F.

F. PERSONNEL CONTACTED

*N. Capra, General Manager
*A. Davis, QC Manager
E. Cochran, Quality Engineer

*Attended Exit Meeting