

ORGANIZATION: Mid-South Nuclear, Inc.
Birmingham, Alabama

REPORT NO.: 999001270/94-01

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NUCLEAR INDUSTRY ACTIVITY: Supplies pipe and steel products for use at commercial nuclear power plants

INSPECTION CONDUCTED: January 25 through 28, 1994

INSPECTOR: Larry Campbell 2/16/94
Larry E. Campbell, Reactor Engineer
Date

Reactive Inspection Section No. 1
Vendor Inspection Branch

OTHER INSPECTORS: David H. Brewer, Metallurgical Engineer

APPROVED: Uldis Potapovs 2-28-94
Uldis Potapovs, Chief Date
Reactive Inspection Section No. 1
Vendor Inspection Branch

INSP. CODE BASIS: 10 CFR Part 21 and Appendix B to 10 CFR Part 50

INSP. CODE SCOPE: To review and evaluate the Mid-South Nuclear, Inc. (MSN) quality assurance program and its implementation in selected areas such as (1) ASME Code, Section III, material upgrade, (2) commercial grade item dedication, (3) receipt inspection and material testing, and (4) preparation of quality documentation and material certification.

PLANT SITE APPLICABILITY: Bellefonte (50-438, 50-439)
Browns Ferry (50-259, 50-260, 50-296)
Sequoyah (50-327, 50-328)
Edwin I. Hatch (50-321, 50-399)
Joseph M. Farley (50-348, 50-364)
Other plants using MSN products

1. INSPECTION SUMMARY

1.1 Violations

Contrary to Section 21.21, "Notification," of Title 10 of the Code of Federal Regulation (10 CFR), Mid-South Nuclear, Inc. (MSN) failed to adopt a procedure to implement the provisions of 10 CFR Part 21 that were effective October 29, 1991, (Violation 99901270/94-01-01, see Section 3.2 of this report).

1.2 Nonconformances

Contrary to Criterion VII of Appendix B to Title 10 of the Code of Federal Regulations (10 CFR) Part 50 and Section 3 of the Mid-South Nuclear Inc. (MSN) Quality Assurance (QA) Manual, neither the applicable MSN material critical characteristics forms nor the sales orders for certain pipe, fittings, plates, shapes, and bars identified adequate critical characteristics and verifications to ensure that the items being supplied met the customer's procurement document requirements (Nonconformance 99901270/94-01-02, see Sections 3.4.1 and 3.4.2 of this report).

Contrary to the requirements of NC-2610 of The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section III, "Rules for Construction of Nuclear Power Plant Components," (Section III) 1989 Edition, MSN issued a Certificate of Compliance that indicated approximately 7000 feet of 1/4 inch by 0.049 inch thick, SA-213, Type 304, stainless steel tubing had been furnished to TVA in accordance with the requirements of ASME Code, Section III, NC-2610, 1989 Edition, without the required involvement of a Certificate Holder (Nonconformance 99901270/94-01-03, see Section 3.5 of this report).

2 STATUS OF PREVIOUS INSPECTION FINDINGS

This was the first inspection at MSN.

3 INSPECTION FINDINGS AND OTHER COMMENTS

3.1 Entrance and Exit Meetings

In the entrance meeting on January 25, 1994, the NRC inspectors discussed the scope of the inspection and established interfaces with MSN management. During the exit meeting on January 28, 1994, the NRC inspectors discussed their findings and concerns with MSN management and other staff.

3.2 10 CFR Part 21

3.2.1 Implementation of the MSN 10 CFR Part 21 Procedure

The NRC inspectors observed that MSN maintained the required 10 CFR Part 21 postings, however the posted copy of MSN Procedure SOP-601, "Identifying and

Reporting Defects and Noncompliances Under the Requirements of 10 CFR Part 21," Revision 0, dated March 16, 1991, failed to incorporate the changes to 10 CFR Part 21 that were effective October 29, 1991. Major changes not incorporated in the MSN procedure included: (1) establishment of a time limit for evaluating potential defects and failures to comply; (2) establishment of a time limit for initial and followup notifications of the NRC; and (3) establishment of channels of communications with the NRC for initial and followup notifications. Also, the posted copy of 10 CFR Part 21 was dated October 31, 1989.

3.3 MSN Commercial Grade Dedication Program

3.3.1 Methodology

The requirements for MSN's dedication process are prescribed in Procedure No. SOP-701, "Dedication of Commercial Grade Items," Revision 3, dated July 15, 1993. The NRC inspectors reviewed Procedure No. SOP-701 and other interfacing procedures controlling MSN's dedication activities. The implementation of MSN's dedication process was also reviewed and is discussed in Section 3.4 of this report.

Incoming customer purchase orders (POs) are initially reviewed by the Sales Department and a sales order is generated. The sales order includes a description of the material to be supplied and instructions for processing the material. Procedure No. SOP-701 requires that critical characteristics for an item to be dedicated be determined by a person who holds an engineering degree and who is familiar with the item, and be documented on MSN Form No. 701, "Material Characteristics Form." A Form No. 701 is not prepared for each sales order, but is prepared for specific types and, in some instances, specific sizes of material (e.g., 4 inch and smaller A-105 carbon steel socket weld fittings or A-36 carbon steel angle). The completed Form No. 701 is reviewed by the QA Manager or the MSN President.

Before releasing the sales order for processing, the QA department reviews it to ensure that adequate instructions have been given, including the verification of critical characteristics identified on the applicable Form No. 701. Also, when a supplier is being used to control and verify a quality-related activity, the QA review ensures that the supplier has been audited or surveyed and approved for performing the activity.

3.3.2 MSN's Supplier Performance Program

MSN Procedure No. SOP-105, "Generation, Control, and Evaluation of Supplier/Item Performance Records," Revision 0, dated July 15, 1993, provides requirements for the generation and control of supplier performance records. The supplier performance information would be used, according to MSN's interpretation of EPRI NP-5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications (NCIG-07)," issue date June 1988, to justify reduced sampling of chemistry and physical properties during material dedication testing. The NRC inspectors concluded that tracking of a supplier's performance appeared to be a strength in MSN's dedication program, and, if properly implemented, may provide a bases for

sampling certain material critical characteristics. However, the NRC inspectors reviewed Procedure No. SOP-105 and its implementation and found the following weaknesses in MSN's supplier performance program:

- (1) The procedure did not prescribe the rationale for the amount of historical product information required to be accumulated before reduced sampling would be permitted. Further, the procedure did not prescribe the plan for reduced sampling. The NRC inspectors determined that MSN Procedure No. SOP-701 addressed the tracking of a nonqualified supplier's performance as the bases for establishing heat and lot traceability, but the bases for the type and amount of data to support a reduced sampling of items from a nonqualified manufacturer was not provided.
- (2) The procedure did not prescribe the basis for adding conforming and nonconforming product data to the data base (e.g., the procedure did not prescribe the entry of failures or nonconformances reported by customers or the basis for such entries). Additionally, there is no guidance as to whether or not nonconforming data will be entered into the data base when the product is authorized for use "as is."
- (3) The procedure did not prescribe limits on historical product information used in justifying reduced sampling for a product. For example, if a steel producer makes austenitic stainless steel bar, tubing, plate, and shapes, and similar carbon and alloy steel products, historical product data from physical overchecks performed on carbon steel plate by MSN should not be used to justify reduced sampling of the chemistry of another specific product such as stainless steel pipe. The NRC inspectors and MSN discussed that historical data used to justify reduced sampling of a product's critical characteristic should be based on historical data for similar products having similar chemistry and form produced using the same process, equipment, and procedures.

3.3.3 Dedication Program Weaknesses

The NRC inspectors reviewed MSN's QA Manual, Revision 1, dated March 25, 1992, and determined that it failed to identify responsibilities and controls for the commercial grade dedication process. Although the title of Section 9, "Control of Manufacturing Processes, Upgrading of Stock Material, Dedication of Commercial Grade Items, and Supply of Component Support Material (NF)," implies that its scope includes the dedication process, this section only requires that a procedure be developed to control the dedication process.

The NRC inspectors concluded that Procedure No. SOP-701 addresses the essential elements of the dedication process and that sufficient guidance for performing activities such as inspection and testing are given in other procedures and instructions. However, the NRC inspectors determined that the following program weaknesses appear to have contributed to the unacceptable dedication packages reviewed by the NRC inspectors (see Nonconformance 99901270/94-01-02 in Sections 3.4.1 and 3.4.2 of this report):

- (1) Procedure No. SOP-701 does not contain requirements or guidance for selecting critical characteristics.
- (2) The bases for not verifying certain material specification requirements (considered to be critical characteristics) are not required to be documented on the Material Critical Characteristics Form No. 701.
- (3) When material overchecks, such as chemistry and tensile testing, are performed to verify critical characteristics and to validate the manufacturer's material certifications, there are no procedural requirements or guidance provided in MSN's dedication program for determining the amount that these test results may deviate from those listed on the manufacturer's certification.
- (4) The NRC inspectors questioned MSN's practice of including nonqualified supplier material certifications (stamped "QA Accepted" during the initial screening of incoming commercial grade items) in documentation packages supplied to customers and not including in its documentation to its customers the results of confirmatory overchecks performed by MSN.
- (5) MSN's QA Manual does not identify: (a) individuals in its organization responsible for or programmatic controls for its commercial grade dedication activities.
- (6) The vendor performance data base is being used as the basis for confirming adequate material traceability controls for nonqualified material manufacturers. The bases for using the data base in lieu of an audit or survey of the material manufacturer's traceability controls is considered an area requiring significant improvement (see Section 3.3.2 of this report).

3.3.4 Dedication Program Strengths

The NRC inspectors considered the following to be strengths in MSN's dedication program:

- (1) MSN personnel performing testing, inspection, and document review activities were knowledgeable about their work and had a positive attitude.
- (2) A material certification for each item supplied is obtained from the manufacturer (qualified and non-qualified manufacturers) and reviewed for conformance with the applicable material specification.
- (3) The tracking of material physical and chemical overchecks to determine a supplier's performance appeared to be a strength in MSN's dedication program, and if properly implemented, should provide a basis for sampling material (see Section 3.3.2 of this report).

3.4 MSN Commercial Grade Dedication Program Implementation

3.4.1 Review of Material Critical Characteristics Forms

The NRC inspectors reviewed several completed material critical characteristics forms and found them unsuitable for providing reasonable assurance that dedicated basic components would perform their intended safety function in all applications. For example, A-36 steel plate, could be used to fabricate a cut and drilled base plate for a heat exchanger in a mild environment or a welded critical seismic pipe support. MSN's past practice required that only a hardness check be performed on A-36 material. MSN's present practice (for certain customers) is to perform chemistry and hardness checks on A-36 material. Depending on the application, certain A-36 specification requirements may be essential for the item to perform its safety function (e.g., when the item is used in a welded critical seismic pipe support, all specification requirements may be essential or in the case where the item is used as a base plate, only a portion of the requirements may be essential). When the specific application is not known, the commercial grade item dedication process should provide reasonable assurance that the item supplied meets all of the specified requirements and would perform its safety function in all applications.

The verification of critical characteristics specified on several MSN material critical characteristics forms may provide reasonable assurance that an item will perform its intended safety related function if used in less critical applications. However, as discussed previously, verification of the specified critical characteristics may not provide reasonable assurance that the item would perform its safety function if used in more critical applications. According to MSN's dedication methodology, the selected critical characteristics, when verified, would provide reasonable assurance that a dedicated basic component would perform its safety function regardless of the criticality of its safety function. The following material critical characteristics forms appear to be typical of critical characteristics selected and verified:

- (1) A-36 structural steel channel, beams, plate, flat bar, round bar, angles, and tees: Markings and selected dimensions are verified, the nonqualified manufacturer's material test reports are reviewed for compliance to the applicable material specification requirements, and a hardness test is performed. MSN did not perform any overchecks to verify that the chemistry and actual tensile properties of the material met specification requirements and were acceptable (Nonconformance 99901270/94-01-02).

Note: For the above and following material characteristics forms and POs in this report, the term nonqualified manufacturer, distributor, or supplier indicates that the manufacturer, distributor, or supplier was not audited or surveyed by MSN and was not on MSN's approved vendor list at the time of the purchase.

MSN informed the NRC inspectors that for TVA orders received after August 1993 and for all Georgia Power Company orders received in 1993,

at least one piece of material from each nonqualified manufacturer's heat was subjected to a chemical analysis. The NRC inspectors reviewed TVA PO No. 93P21-36770H and MSN Sales Order No. 3552, dated September 2, 1993, and Georgia Power Company PO No. 60120920000 and MSN Sales Order No. 3339, dated March 25, 1993, and verified that at least one piece of A-36 material from each heat, supplied by the nonqualified supplier, had been subjected to a chemical analysis.

- (2) A-105 carbon steel fittings, flanges (all sizes); A-333 pipe; and A-285 vessel plate: Markings and selected dimensions were verified, the nonqualified manufacturer's material test reports were reviewed for compliance to the applicable material specification requirements, and a hardness test was performed. For these items, MSN material critical characteristics forms did not require the performance of any overchecks to verify that the chemistry and tensile properties of the material met specification requirements and were acceptable (Nonconformance 99901270/94-01-02).
- (3) A-312 and A-376 austenitic stainless steel pipe; A-182 forged austenitic stainless steel flanges and fittings; and A-276 stainless shapes: Markings and selected dimensions were verified, the nonqualified manufacturer's material test reports were reviewed for compliance to the applicable material specification requirements, and a chemistry check was performed. For these items, MSN material critical characteristics forms do not require the performance of any overchecks to confirm that the material had the physical properties or had been subjected to any heat treatment required by the applicable material specification (Nonconformance 99901270/94-01-02).

MSN informed the NRC inspectors that NRC license... had audited them and that they believe auditors from TVA and Georgia Power Company had reviewed some of the material critical characteristics forms during their audit of MSN's commercial grade dedication program.

3.4.2 Review of Sales Order Packages

The NRC inspectors reviewed the following in-process and completed commercial grade material dedication sales order packages to determine if the critical characteristics for materials had been properly identified and verified, and if adequate procedural controls were in place. The NRC inspectors also observed in-process inspection activities and processing of sales orders.

1. Sales Order No. 3381, Item 1, was for the supply of 2 1/2-inch-diameter by 10-foot-long, A-36 carbon steel round bar, in accordance with Bechtel Corporation (Bechtel) PO No. 21042-C-0227Q, Revision 0, dated April 16, 1993. MSN purchased this material from a nonqualified supplier, North Star Steel, Michigan Division, Monroe, Michigan. MSN verified that markings and selected dimensions were correct, reviewed the nonqualified manufacturer's material test report for conformance with the material specification requirements, and performed a hardness test. MSN did not perform any overchecks to verify that the chemistry and tensile properties of the material met specification requirements

and were consistent with the test results reported on the nonqualified manufacturer's material certification.

Note: For this PO and other Bechtel POs identified in this report Bechtel was acting as purchasing agent for TVA's Browns Ferry Nuclear Plant.

2. Sales Order No. 3309, Item 1, was for the supply of one A-234, Grade WPB, butt weld connection, reducing pipe tee with openings of 3 inch diameter by 4 inch diameter by 4 inch diameter, in accordance with Bechtel PO No. 21042-T-0536Q, Revision 0, dated February 24, 1993. Two tees were purchased from a nonqualified distributor, Dodson Company, Ellenwood, Georgia. The Dodson Company purchased these tees from a nonqualified manufacturer, Hackney, Inc., Dallas, Texas.

MSN verified that markings and selected dimensions were correct, reviewed the nonqualified manufacturer's material test reports for conformance with the material specification requirements, and performed a hardness test on the tee shipped to TVA. The hardness value reported by MSN showed acceptable correlation to that reported by the manufacturer. Also, MSN contracted with Newton Engineering and Metallurgical Services (NEMS), a qualified test laboratory, for performing a chemical analysis by destructively testing the second tee. The chemical analysis performed by NEMS showed acceptable correlation to that reported on the manufacturer's certified material test report (CMTR). Chemical analysis and hardness testing were required by the MSN Material Critical Characteristics Form No. A-234-1, "Butt Weld Fittings," Revision 0, dated February 18, 1992, however no testing was required to be performed to verify tensile properties of the material. Because no traceability program provided assurance that the pieces came from the same starting piece, the tee shipped may not have the same chemistry as the tee subjected to the chemical analysis by NEMS.

3. Sales Order No. 3225, Item 1, was for the supply of one 3-foot-long, 5 inch nominal diameter, schedule 120, A-312, Type 304, seamless stainless steel pipe in accordance with Bechtel PO No. 21042-T-0504Q, Revision 0, dated January 5, 1993. The pipe was purchased from a nonqualified distributor, Prudential Stainless Pipe, Newark, New Jersey. Prudential Stainless Pipe purchased the pipe from a nonqualified manufacturer, Sumitomo, Tokyo.

MSN verified that markings and selected dimensions were correct, reviewed the nonqualified manufacturer's material test reports for conformance with the material specification requirements, and contracted with NEMS for chemical analysis on a piece of pipe cut from the pipe shipped to TVA. The chemical analysis performed by NEMS showed acceptable correlation with that reported by the manufacturer. Chemical analysis was the only testing required by the MSN Material Critical Characteristics Form No. A-312-1, "Austenitic Stainless Steel Pipe," Revision 0, dated February 18, 1992. This material critical characteristics form did not require the performance of any overchecks

to confirm that the pipe had the physical properties or heat treatment required by the material specification.

4. Sales Order No. 3292, Item 1, was for the supply of six pieces of 16 inch nominal diameter, schedule 30, SA-105, Class 150, raised face weldneck pipe flanges, in accordance with Bechtel PO No. 21042-SW-2012AQ, Revision 0, dated February 11, 1993. The Bechtel PO required that the flanges be supplied in accordance with the requirements of NCA-3800 of the ASME Code, Section III, (NCA-3800), but identified no Code Class. MSN purchased the flanges from Daniel Industrial, Houston, Texas, a nonqualified supplier.

MSN issued a Certificate of Compliance, dated February 12, 1993, indicating that these flanges were supplied in accordance with the requirements of NCA-3800. To upgrade this material MSN only performed a hardness test on each of the six flanges and a dimensional evaluation of one flange. MSN did not perform chemical analysis or tensile testing on any of the flanges. The NRC inspectors and MSN discussed the upgrade requirements of NCA-3800 and agreed that the requirements of NCA-3800 had not been met. MSN informed the NRC inspectors that because no ASME Code Class was identified on the Bechtel PO, the flanges were processed in accordance with its commercial grade item dedication program.

MSN further explained that after shipping the flanges on February 12, 1993, a request was received from Bechtel on February 25, 1993, to revise the material description on its Certificate of Compliance to include ASME Code, Section III, Class 2. In a response to Bechtel, dated February 26, 1993, MSN stated that the material shipped on February 12, 1993, did not meet the requested requirements. On March 2, 1993, MSN issued a revision to the Certificate of Compliance, deleting reference to NCA-3800, and stating that the flanges were supplied in accordance with the MSN Quality Assurance Program, Revision 1, dated March 25, 1992, which met the requirements of ANSI N45.2.

Although the NRC inspectors reviewed the revised documentation package for the flanges and determined that the flanges were processed in accordance with MSN's commercial grade item dedication program, the traceability requirements of ANSI N45.2 do not appear to have been met. There was no objective evidence in MSN's vendor qualification files or in any of the documentation reviewed indicating the flanges came from the same starting piece. Hardness testing was the only testing required by the MSN Material Critical Characteristics Form, A/SA105-1, "Forged Carbon Steel Flanges," Revision 0, dated February 18, 1992. MSN did not perform any overchecks to verify that the chemistry and actual tensile properties of the flanges met specification requirements.

5. Sales Order No. 3428 was for the supply of Items 1-6, A-36 structural steel plate, angle, and bars of various sizes, lengths, and quantities supplied in accordance with TVA PO No. P-93PJX-36732H-001, dated April 12, 1993. The TVA PO required that these items be delivered to the TVA Muscle Shoals Distribution Center in Muscle Shoals, Alabama.

MSN purchased some of these items from a distributor, Siskin Steel & Supply Company (Siskin) located in Birmingham, Alabama. MSN had audited and qualified Siskin for maintaining control of material within its facility. Siskin performs no audits of its suppliers and performs no material overchecks. Siskin purchased these items from the following nonqualified manufacturers: (1) Tuscaloosa Steel Corporation, (2) SMI Steel Inc., (3) Birmingham Steel Corporation, and (4) Geneva Steel.

MSN verified that markings and selected dimensions were correct, reviewed the nonqualified manufacturers' material test reports for conformance with the material specification requirements, and performed a hardness test on each item in a heat. MSN did not perform any overchecks to verify that the chemistry and tensile properties of the items met specification requirements and were consistent with the test results reported on the nonqualified manufacturers' material certifications.

6. Sales Order Nos. 3376 and 3376A were for the supply of Items 1-19, A-36 structural steel items such as plates, angles, channels, and bars, of various sizes, lengths, and quantities in accordance with TVA PO No. P-93PGC-36737H, dated May 13, 1993. The TVA PO required that these items be delivered to the TVA Muscle Shoals Distribution Center in Muscle Shoals, Alabama. MSN purchased these items from a distributor, Siskin, and from nonqualified manufacturers. Siskin purchased these items from nonqualified manufacturers. Siskin was only qualified by MSN for maintaining material identification for items from receipt in its facility through shipping to MSN (see Item 5 above). Manufacturers for these items were: (1) Tuscaloosa Steel Corporation, (2) Bethlehem Steel Corporation, (3) Hanna Steel Corporation, (4) SMI Steel, Inc., (5) Northwestern Steel and Wire Company, (6) Florida Steel Corporation, (6) North Star Steel Kentucky, Inc., and (7) Bayou Steel Corporation.

MSN verified that markings and selected dimensions were correct, reviewed the nonqualified manufacturers' material test reports for conformance with the material specification requirements, and performed a hardness test on at least one item from each manufacturer's heat and in some cases on each item in a heat. MSN did not perform any overchecks to verify that the chemistry and tensile properties of the items met specification requirements and were consistent with the test results reported on the nonqualified manufacturers' material certifications.

Each MSN documentation package furnished for the above POs included the nonqualified manufacturer's CMTRs, but did not contain or identify the overchecks performed by MSN. The CMTRs were stamped MSN QA accepted and there was no indication that the CMTRs were from nonqualified manufacturers.

The NRC inspectors concluded that the critical characteristics verified by MSN for the above POs did not provide reasonable assurance that the specified PO requirements had been met (Nonconformance 99901270/94-01-02).

3.5 ASME Code Upgrade Program Implementation

The NRC inspectors reviewed the following in-process and completed material upgrades to determine if the requirements of NCA-3800 of the ASME Code, Section III, had been met.

1. Sales Order No. 3536, Item 1, was for the supply of one 12-inch nominal diameter pipe cap, schedule 80, ASME SA-234, Grade WPB, starting with SA-516, Grade 70, ASME Code, Section III, Class MC, 1971 Edition with Summer 1971 Addenda, in accordance with Alabama Power Company PO No. QP931465, dated August 5, 1993, for Joesph M. Farley Nuclear Plant (Farley). MSN purchased two pipe caps from Alloy Piping Products, Inc. (APP), Shreveport, Louisiana, which had a qualified material traceability program and was on the MSN approved suppliers list for that program. To upgrade this material, MSN contracted Laboratory Testing, Inc. (LTI), an approved supplier for testing services, to perform chemical analysis, tensile testing, hardness testing, and impact testing. The chemical analysis was performed on chips removed from the pipe cap delivered to the customer. All other tests were performed on the second pipe cap, destroyed for testing purposes. Test results produced by LTI showed reasonable correlation with results reported by APP except for the carbon content of the chemical analysis. Carbon content determined by LTI was 0.11% compared to 0.24% determined by APP. MSN explained this discrepancy as possible surface decarburization in the specimen taken from the pipe cap that MSN shipped.
2. Sales Order No. 3528, Item 1, was for the supply of approximately 7000 feet of 1/4 inch diameter, 0.049 inch wall thickness, ASME Code, Section III, Class 2, SA-213, Type 304, stainless steel seamless tubing, in accordance with Bechtel PO No. 21042-TS-990Q, Revision 0, dated August 10, 1993, and Revision 1, dated September 7, 1993. Revision 1 of this PO was issued to inform MSN that, as of August 31, 1993, Bechtel would cease to act as an agent for TVA at the Browns Ferry nuclear plant and would cease to administer this PO. MSN purchased the tubing from Salem Tube Inc. (Salem Tube), Greenville, Pennsylvania. Salem Tube purchased the starting material from which the tubing was drawn (24 pieces of Type 304/304L redraw hollows, 1.315 inch outside diameter by 0.133 inch wall thickness) from TUBACEX, a nonqualified Spanish material manufacturer.

The NRC inspectors reviewed the MSN approved supplier list and its audit of Salem Tube and determined that no audits or surveys had been performed at TUBACEX to support material traceability for the 24 hollows. MSN performed an audit at Salem Tube on September 9, 1993, and determined that Salem Tube did not audit its suppliers of material or services. The MSN audit report documented objective evidence to support Salem Tube's capabilities to perform significant activities such as: (1) having adequate controls to provide assurance that heat code identity is maintained during all of the manufacturing processes, (2) maintaining an adequate test laboratory for mechanical testing (e.g., the calibration standards for the tensile tester referenced NIST trace numbers), (3) hydrostatic testing of tubing was observed during

the audit and the in-house calibrations for gauges used during the hydrostatic testing referenced a NIST trace number, and (4) the MSN auditor witnessed MSN's order for the tubing being processed which included 20 different manufacturing steps. The audit also identified several areas where Salem Tube did not have adequate controls such as (1) calibration of its furnaces, (2) control of its subsuppliers (e.g., chemical analyses performed by outside sources), and (3) performance of internal audits.

The documentation reviewed by the NRC inspectors and discussions with MSN revealed that from the 24 hollows (TUBACEX and Salem Tube Heat Code MPA), Salem Tube produced approximately 360 tubes in 4 separately heat treated lots (Lot Nos. 1, 1A, 2, and 2A). One tube from each lot was subjected to mechanical testing by Salem Tube and MSN performed a chemical analysis on one (1) of the 360 tubes, and the test results indicated conformance to the SA-213, Type 304, requirements. The NRC inspectors expressed the following concern to MSN about the number of tests performed on the tubing.

There were 24 starting hollows from which the 360 tubes were produced. There was no objective evidence to indicate that the 24 hollows came from the same starting ingot. Also, there were no chemical overchecks performed on the 24 hollows to confirm that material traceability had been maintained. Under these circumstances, the stock material upgrading requirements of NCA-3800 would require a chemical analysis be performed on each tube. Because material traceability had not been established, the 4 mechanical tests and one chemical analysis may not provide reasonable assurance that all tubes were properly annealed and their mechanical properties and chemistry met specification requirements.

MSN's response to the NRC's concern was that they considered the 24 hollows supplied by TUBACEX to be traceable to the same heat based on the historical performance of other materials manufactured by TUBACEX and independently tested by MSN. MSN informed the NRC inspectors that it had performed mechanical and chemical overchecks on 5 heats of TUBACEX stainless pipe in 1993 prior to performing its chemical overcheck of the one piece of 1/4 inch tubing, and according to MSN Procedure No. SOP-105, these previously satisfactory test results may be used as the basis for establishing heat traceability for a manufacturer that has not been audited.

The NRC inspectors discussed with MSN the use of Procedure No. SOP-105 for the supply of ASME Code, Section III, class material. As written, Procedure No. SOP-105 is used for determining when credit can be given to an unqualified manufacturer as being capable of maintaining material traceability based on the results of historical chemical and physical overchecks performed by MSN on material supplied by the manufacturer. Also, Procedure No. SOP-105 is applicable for manufacturers supplying commercial grade items to be dedicated as basic components. Because material is being supplied in accordance with the ASME Code, Section III, Class 2, (nuclear unique requirements), MSN should not have used

the commercial grade item dedication provisions of 10 CFR Part 21 and Procedure No. SOP-105 for supplying the 1/4 inch tubing on MSN's Sales Order No. 3528, but should have used provisions contained in the ASME Code, Section III, (e.g., NCA-3800).

MSN informed the NRC that they had not supplied the 1/4 tubing in accordance with NCA-3800, but in accordance with the requirements of NC-2610 of the ASME Code, Section III, (NC-2610), 1989 Edition. The NRC inspectors questioned the initial MSN Certificate of Compliance, dated September 29, 1993, because it did not state that the tubing was supplied in accordance with NC-2610. MSN provided the NRC inspectors with a revised Certificate of Compliance, dated January 14, 1994, stating the tubing was supplied in accordance with NC-2610 and was to be used for instrument tubing and not for heat exchanger tubing.

After reviewing MSN correspondence with TVA and the quality record package for the 1/4 inch tubing, the NRC inspectors asked to review TVA's authorization for supplying the tubing in accordance with NC-2610, and not NCA-3800. The NRC inspectors found no changes to the TVA PO No. 21042-TS-990Q indicating that the tubing was not going to be used for heat exchanger applications or that MSN was authorized to supply the tubing in accordance with the provisions of NC-2610.

According to MSN, TVA verbally informed it that the tubing could be provided in accordance with NC-2610 and that the tubing would only be used for instrumentation tubing. MSN stated that this was the basis for MSN revising its certification.

Also, MSN informed the NRC inspectors that they were in error by initially processing this order in accordance with NC-2610 because the applicable material specification, SA-213, "Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat Exchanger Tubes," 1989 Edition, includes the manufacture of heat exchanger tubes and that the ASME Code, Section III, prohibits heat exchanger tubing from being supplied to NC-2610 requirements.

The NRC inspectors informed MSN that NC-2610 permits, in part, that certain small products may be furnished as ASME Code, Section III, class material with a Certificate of Compliance certifying that the material is furnished in accordance with the applicable material specification and the applicable requirements of the ASME Code, Section III. However, NC-2610 further requires that for these small products, the Certificate Holder's Quality Assurance Program (NCA-4000) shall provide measures to assure that the applicable specification and Code requirements are met. NCA-9000 of the ASME Code, Section III, defines Certificate Holder as an organization holding a valid N, NPT, or NA Certificate of Authorization issued by the ASME.

Contrary to the above requirements, MSN issued a Certificate of Compliance that indicated approximately 7000 feet of 1/4 inch outside diameter by 0.049 inch wall thickness, SA-213, Type 304, seamless stainless steel tubing had been furnished to TVA in accordance with the

requirements of ASME Code, Section III, NC-2610, 1989 Edition, without the required involvement of a Certificate Holder. The Certificate of Compliance also indicated that the material met Material Specification SA-213 and ASME Code, Section III, Class 2, 1989 Edition, requirements. Since MSN is not a Certificate Holder and only holds a Quality System Certificate, MSN should have furnished the tubing in accordance with NCA-3800 requirements (Nonconformance 99901270/94-01-03).

3. Southern Nuclear Operating Company PO No. QP941017, dated January 12, 1994, Item 2, was for the supply of five, SA-403, WP304/304L, ASME Code, Section III, Class 3, schedule 40, 8 inch nominal diameter, 90 degree elbows for the Alabama Power Company's Farley nuclear plant. The elbows were purchased from APP, Shreveport, Louisiana, which had a qualified material traceability program and was on the MSN approved suppliers list. MSN was processing this PO during the performance of the NRC inspection, and planned to upgrade the material by destructively testing one elbow (for tensile testing and chemical analysis) and performing chemical analysis on shavings from each elbow to be shipped.

4 PERSONNEL CONTACTED

Mid-South Nuclear, Inc.

- * + Earl A. George, President
 - * + E. A. George, Jr., Vice President and Quality Assurance Manager
 - * + Jim Moore, Sales Representative
 - + Elaine Chastain, Quality Assurance Representative
 - + Henry Wollek, Quality Control Inspector
-
- * Attended the Entrance Meeting
 - + Attended the Exit Meeting