

ORGANIZATION: LTV STEEL COMPANY
YOUNGSTOWN, OHIO

REPORT NO.: 99900881/84-01	INSPECTION DATES: 10/1-5/84	INSPECTION ON-SITE HOURS: 70
CORRESPONDENCE ADDRESS: LTV Steel Company Tubular Division P. O. Box 1000 1315 Albert Street Youngstown, Ohio 44501		
ORGANIZATIONAL CONTACT: Robert S. Spinetti, Manager, Quality Assurance TELEPHONE NUMBER: (216) 742-5934		
PRINCIPAL PRODUCT: Seamless Pipe		
NUCLEAR INDUSTRY ACTIVITY: Currently less than 1%.		
ASSIGNED INSPECTOR: <u>E. T. Baker</u> <u>12/6/84</u> Edward T. Baker, RIS, VPB Date		
OTHER INSPECTOR: E. H. Trottier, RIS, VPB		
APPROVED BY: <u>E. T. Baker</u> <u>12/6/84</u> E. W. Merschoff, Chief, RIS, VPB Date		
INSPECTION BASES AND SCOPE: A. <u>BASES</u> : 10 CFR Part 21, NCA-3800, Material Specifications. B. <u>SCOPE</u> : This inspection was made to verify implementation of LTV Steel Company's (LTV) Quality Assurance Program with respect to its activities as a manufacturer of seamless pipe for the nuclear industry. It included verification of LTV's compliance with quality assurance provisions contained in Subarticle NCA-3800 of Section III of the ASME Boiler and		
PLANT SITE APPLICABILITY: Not determined.		

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B. SCOPE: (continued)

Pressure Vessel Code, material specifications, contractual requirements and 10 CFR Part 21.

A. VIOLATIONS

1. Contrary to Section 21.6 of 10 CFR Part 21, LTV had not posted Part 21, Section 206 of the Energy Reorganization Act of 1974 or their Part 21 procedures.
2. Contrary to Section 21.2 of 10 CFR Part 21, LTV did not evaluate or notify their customers of piping which did not meet minimum wall thickness requirements.

B. NONCONFORMANCES

1. Contrary to Subparagraph NCA-3866.2 of Section III of the ASME Boiler and Pressure Vessel Code and Section 5 of the LTV Quality Assurance Manual (QAM), LTV had not developed and implemented procedures to control the distribution of, changes to, or use of the Standard Procedures and Process Control Manual (SPPCM).
2. Contrary to Subparagraph NCA-3867.1 of Section III of the ASME Boiler and Pressure Vessel Code and ASTM/ASME SA-530, LTV had not developed and implemented examinations and tests that would assure that the minimum wall thickness at any point is not more than 12.5% less than the nominal wall thickness specified, for piping manufactured prior to August 1983.
3. Contrary to Subparagraph NCA-3867.3 of Section III of the ASME Boiler and Pressure Vessel Code, the Disposition Instructions in the Standard Procedures and Process Control Manuals (SPPCM) do not adequately address identification of nonconforming material.
4. Contrary to Subparagraph NCA-3868.1 of Section III of the ASME Boiler and Pressure Vessel Code, LTV did not have a procedure for the calibration of the rotary hearth temperature gages/controllers.
5. Contrary to Subparagraph NCA-3869.2, LTV had not taken adequate or timely corrective action on nonconformances reported in customer claims due to procedural inadequacies.

C. UNRESOLVED ITEMS

None.

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D. STATUS OF PREVIOUS INSPECTION FINDINGS

This was the first inspection at LTV's Campbell Works, Seamless Tube Plant.

E. OTHER FINDINGS OR COMMENTS

1. 10 CFR Part 21 Procedures and Implementation

Inspection of shops, offices and production areas of the LTV-Campbell Works Seamless Tube Plant did not reveal any posting of a current copy of Section 206 of the Energy Reorganization Act of 1974, or a current copy of 10 CFR Part 21. Further, no procedures to implement the requirements of 10 CFR Part 21 (or a description of such implementing procedures) could be found.

A procedure addressing 10 CFR Part 21 requirements was prepared in 1978 by a company since subsumed by LTV. This procedure did not address the areas of nonconformance evaluation, or customer notification.

Violations A.1 and A.2 address this area.

2. Training

Although NCA-3800 does not have any requirements on training for other than nondestructive examination personnel, LTV has held training sessions with all production and quality personnel to familiarize them with the new Integrated Process Control program.

3. Manufacturing and Quality Control Procedures

LTV recently implemented a new Integrated Process Control program which combines in a single manual the manufacturing and quality control procedures. The procedures are written so that manufacturing and inspection instructions for a specific operation, e.g., piercing of rounds, are contained in a pocket size manual which describes critical manufacturing parameters and acceptable ranges; inspection methods, characteristics to be inspected and acceptance/rejection criteria; and the responsibilities of all personnel involved, e.g., the machine operator, inspector, production foreman, and quality control supervisor. The procedures were well written, easily understood and except for a problem in the area of identification of nonconforming material, were complete.

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The Disposition Instructions for Control Areas 9.3.1, 11.1.1, 11.2.1, 12.1.1, 12.2.1, 12.3.1, 30.3.2, 39.3.2 and 41.1.1 do not provide instructions on how nonconforming material is to be tagged or marked, what color the tag should be, what marking material should be used, or what color banding should be used. Disposition Instructions for Control Areas, 10.1.1, 14.2.1, 29.1.1, 30.2.1, 37.1.1, 38.1.1, and 39.3.1 do not address the identification of nonconforming material at all.

Nonconformance B.3 addresses this area.

4. Document Control

The QAM and SPPCM were reviewed for procedures on controlling their distribution, the distribution and control of changes to them, and their use. No problems were found with the QAM. However, LTV had not developed any procedures covering the SPPCM.

Nonconformance B.1 addresses this area.

5. Examinations and Tests

The inspector reviewed inspection procedures, manufacturing/process control instructions, records of wall thickness examinations for piping produced both before and after the mill was rebuilt, and the monthly "light and heavy" reports for 1982.

- a. The inspector reviewed strip charts of wall thickness measurements made by a third party on 7 pieces of petroleum industry pipe produced prior to rebuilding the mill. All of the pipe was 7" outside diameter, with the nominal wall thickness ranging from .317" to .453". Due to eccentricity of the pipe, the wall thickness of the .453 nominal wall pipe varied from .510" at 0° to .415" 180° from the thickest wall. The thickness along the length of the pipe, starting at the point on the end which measured .415", varied .055". This results in the thinnest section of the pipe varying 12% along its length.

When measured along the thinnest section of the pipe, two pieces of pipe exhibited a 12% variation along the length of the pipe, four pieces of pipe exhibited an 11% variation, and one piece exhibited a 7% variation.

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The inspection method used by LTV was to mechanically gage both ends of the pipe using a go/no-go, with an acceptance or go size equivalent to the allowable minimum wall thickness. The combination of this inspection technique with the 12% variation in wall thickness along the thinnest section of the pipe could result in piping which just meets the minimum thickness requirements when gaged on both ends and is, in the worst case, 12% below the minimum allowable wall thickness somewhere along its length, being accepted and shipped.

- b. The inspector reviewed strip charts from wall thickness measurements made by LTV during their 100% ultrasonic inspection for approximately 500 pieces of SA-106 piping produced after the mill had been rebuilt. All of the pipe was 7-5/8" outside diameter with .328" nominal wall thickness. For each run of pipe LTV was aiming for a .341" average wall. The worst case observed was a total variation in wall thickness of .053" from the target thickness, a reduction in variance of 50% over the old mill. The thickest section measured .371" and the thinnest measured .318". The worst case variation measured along the thinnest section of the pipe was only 6%, again a 50% reduction over the old mill.
- c. In addition, LTV instituted 100% ultrasonic inspection on all pipe produced in the new mill. This provides LTV with the ability to monitor the manufacturing process and detect when process control parameters start to deviate from the allowable range. It also provides assurance that the wall thickness at any point is not more than 12.5% under the nominal thickness specified.

Nonconformance B.2 addresses this area.

6. Control of Measuring and Test Equipment

- a. The inspector reviewed the applicable section of the QAM and yearly calibration records for 11 "working" measurement rods, 16 "master" measuring rods, outside micrometers and master ring and plug (thread) gages. In addition, certificates of calibration traceable to the National Bureau of Standards were reviewed for the master measuring rods (NBS Test No. 738/227676), and gage blocks (NBS 738/223690). Certificates of calibration traceable to the Watertown Arsenal were reviewed for the impact testing machines for the past two years. The calibration laboratory, storage area and record keeping functions were particularly well organized and managed.

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The instructions on what to do when equipment used for acceptance of material, is found to be outside allowable tolerances when it is calibrated, were located in Paragraph 14a-1a of the QAM, under the title "Inspection Rejects". These provisions would be more appropriately placed under Paragraph 8c "Calibration Procedures and Frequency".

- b. During the plant tour it was observed that there were no calibration stickers on the temperature gages/controllers for the rotary hearth. In pursuing this issue it was discovered that the calibration of instruments for the rotary hearth was not covered by existing calibration procedures. However, the rotary hearth instruments had been calibrated by a subcontractor, according to a schedule established by LTV.

Nonconformance B.4 addresses this area.

7. Corrective Action

Seventeen customer claim files were reviewed to determine the effectiveness of corrective action taken by LTV in response to nonconformances brought to their attention by purchasers. (The nonconformances were in every case piping having a wall thickness below the minimum required.) The review revealed the absence of a formal, documented mechanism by which the root cause (as opposed to the result) of such nonconformances is evaluated and corrected. To date, emphasis is concentrated on fiscal responsibility, with judgments rendered - usually by an LTV field representative - in the form of reshipments or credits. Corrective action is not routinely applied to the cause of the nonconformance, only the result.

Nonconformance B.5 addresses this area.

Company JONES & LAUGHLIN (LTV) STEEL PERSONS CONTACTED

Dates October 1-5, 1984

Inspector E. H. Trotter

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
1	4	J&L QA Manual	3-1-81	1
2	4	J&L QA Manual	4-15-83	2
3	8	CPE Analysis "A Study Of Seamless Wall Thickness Control"	2-10-83	
4	3	IPC No 1 Seamless Finishing Control Areas 7, 8, 9, 10, 11, 12	9/84	
5	3	IPC No 1 & No 3 Floor Primary Inspection Control Area 13	9/84	
6	3	IPC No 1 Seamless Finishing Control Areas 14, 15, 16, 17	9/84	
7	3	IPC No 1 & No 3 Seamless Finishing Control Area 18	9/84	
8	3	IPC No 1 Seamless Finishing Point Thickness Control Areas 23 & 24	9/84	
9	3	IPC No 3 Seamless Finishing Control Areas 25, 26, 27, 28, 29	9/84	
10	3	IPC No 3 Seamless Finishing Control Areas 30, 31, 32, 33	9/84	
11	3	IPC No 1 Seamless Finishing Control Areas 35, 36, 37, 38	9/84	
12	3	IPC No 1 Seamless Finishing Control Area 39, 40, 41, 42, 43, 44	9/84	
13	3	IPC No 2 Seamless Finishing Control Areas 14, 15	9/84	
14	3	IPC No 2 Seamless Finishing Control Areas 16, 17	9/84	
15	3	IPC No 2 Seamless Finishing Control Areas 18, 19	9/84	
16	3	IPC No 2 Seamless Finishing Control Areas 20, 21, 27	9/84	
17	3	IPC No 2 Seamless Finishing Control Areas 22, 23, 24	9/84	

Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual

5. Purchase Order
6. Internal Memo
7. Letter
8. Other (Specify if necessary)

Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)

Scope/Module

DOCUMENTS EXAMINED

[illegible]

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1. Drawing
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6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)

INSPECTOR E.H. TROTTERSCOPE

DOCUMENTS EXAMINED

DOCKET NO. 9900881REPORT NO. 84 - 01
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ICM NO.	TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
31	NDR	82-48	-	OCT 16, 82	P.O. A57908; 3, 2 1/2" pc and 2, 1" pc Barw
32	NDR	82-53	-	JUN 30, 82	P.O. A55808; 1, 12 1/2" pc Barw
33	NDR	82-21	-	FEB 8, 82	P.O. A53647; 1, 1" pc Barw
34	NDR	82-20	-	APR 6, 81	Invoice No 32-08-02529; 1, 6" pc Barw
35	NDR	83-08	-	JUN 3, 82	Invoice No 32-08-02818;
36	CUST	332298	-	APR 8, 83	Pipe Sterilized std well, Actual = X Strong (C.F. Guyon)
37	CUST	232029	-	OCT 7, 83	Incorrect thickness alleged - NOT valid
38	Cust	442111	-	NOV 8, 83	14 lengths of 204 rejected - Barw thickness
39	Cust	392012	-	MAY 26, 83	1 pc of 36 Rejected (NOT Jil Steel)
40	LTR	-	-	MAY 16, 83	Calibration letter for Impact Machine - Waterford Macabrig
41	LTR	-	-	JUL 29, 83	Calibration letter for Impact Machine - Waterford Macabrig
42	LTR	-	-	MAY 25, 84	Calibration Cert. letter for Impact Machine (Satec Systems, Inc)
43	LTR	-	-	MAY 27, 83	Calibration Cert. letter for Impact Machine (Satec Systems, Inc)
44	LTR	-	-	JUN 15, 82	Calibration Cert. letter for Impact Machine (Satec Systems, Inc)
45	INM	-	-	JUL 14, 78	Procedure for Reporting Defects and Non Compliance Reg'd by 10 CFR Part 21

(Very Noisy Sound)
Steel Document

TYPE OF DOC:

DWG - DRAWING
SPEC - SPECIFICATION
PRO - PROCEDURE
QAM - QA MANUAL
QCD - QC DOCUMENT
P.O. - PURCHASE ORDER
INM - INTERNAL MEMOLTR - LETTER
NDR - Non Defect Report
CUST - CUSTOMER
INM - INTERNAL MEMOLTR - LETTER
NDR - Non Defect Report
CUST - CUSTOMER
INM - INTERNAL MEMO

Disposition Report (and File)

INSPECTOR C. H. ROYER

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ITEM NO.	TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
16	Crest	9B2118	-	Nov 16, 78	U.S. STEEL (NOT JIC) Supplied
17	Crest	162225	-	May 6, 81	API (oil Country) L-80 Steel - No claim Filed
18	NDR	84-19	-	Apr 24, 82	P.O. AS366SN; 1, 10'4" pc of 3" pipe Bmw
19	NDR	84-12	-	Apr 24, 82	P.O. AS366SN; 1, 30'7" pc of 3" pipe Bmw (length)
20	NDR	84-2	-	Apr 24, 82	P.O. AS366SN; 6, 230' pca of 3" pipe Bmw (length)
21	NDR	83-44	-	Apr 24, 82	P.O. AS366SN; 8, 230' pca (length) of 3" pipe Bmw
22	NDR	83-41	-	Apr 21, 82	P.O. AS366SN; 7 pca (10'25/8" l) of 3" pipe Bmw
23	NDR	83-40	-	Apr 21, 82	P.O. AS366SN; 1, 2 ft pc of 3" pipe Bmw
24	NDR	82-29	-	Apr 29, 82	P.O. AS366SN; 1, 21'1" pc plus 3.1 ft pca of 3" pipe Bmw
25	NDR	83-18	-	Dec 26, 81	P.O. AS3847N; 1, 41'4" pca of 2" pipe Bmw
26	NDR	82-25	-	Dec 26, 81	P.O. AS3847N; 1, 42' pc of 2" pipe Bmw
27	NDR	82-19	-	Dec 8, 81	P.O. AS3847N; 1, 6' pc of 8" pipe Bmw
28	NDR	81-58	-	Dec 8, 81	P.O. AS3847N; 1, 1'5" pc of 8" pipe Bmw
29	NDR	83-13	-	Jun 23, 82	P.O. AS5854N; 1, 40'1" pc of 2 1/2" pipe Bmw
30	NDR	83-3	-	Oct 16, 82	P.O. AS7908N; 1, 34'6" pc and 2, 17' pca Bmw

TYPE OF DOC:

DWG - DRAWING
SPEC - SPECIFICATION
PRO - PROCEDURE
QAM - QA MANUAL
QCD - QC DOCUMENT
P.O. - PURCHASE ORDER
INM - INTERNAL MEMO

MR - LETTER

668 - LETTER
668 - Performance - Disposition Report (and File)

INSPECTOR E. H. PROFFER

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ITEM NO.	TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
1	QAM	-	1	Mar 1, 81	QA Manual, Jones & Laughlin Steel Corp. - Tubular Division
2	QAR	-	2	Apr 15, 83	QA Manual, Jones & Laughlin Steel Corp. - Eastern Div. - Tubular Products
3	INM	-	-	JUL 14, 78	Procedure for Reporting on Defects + Nonconformance as Reg'd by 10CFR21
4	INM	-	-	SEP 21, 84	Monthly Report (Apr 84) Tubular Claims (Customer Complaints)
5	PRO	JL 9229	-	-	Prep. of Product Technical Service "Report of Visit" (Cust. Complaint eval)
6	INM	-	-	-	Monthly Report (July 83) Tubular Claims
7	CUST.	252525	-	Apr 30, 82	Misidentified Steel (Part of shipment had wrong heat #)
8	CUST.	272399	-	JUN 12, 82	Encaver Order by Customer
9	CUST.	292322	-	JAN 16, 82	Encaver Spec. ordered by Customer
10	CUST.	042022	-	MAY 18, 79 Aug 2, 80	Oil Country Pipe
11	CUST.	142299	-	JUN 9, 80	Encaver Steel but NOT Conclusively T/C Supplied
12	CUST.	042129	-	Mar 9, 80	Oil Country Pipe
13	CUST.	002170	-	Dec 9, 80	Oil Country Pipe couplings
14	CUST.	972154	-	JUN 18, 78	Oil Country Pipe fittings
15	CUST.	972266	-	JUN 5, 79	Proprietary Grade (Spec 94) Welding Fitting

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