



THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

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PERRY NUCLEAR POWER PLANT

February 18, 1985
PY-CEI/NRR-0150L

Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
Additional Information
on Containment Pressure
Boundary Fracture Prevention
(Confirmatory Issue 58)

Dear Mr. Youngblood:

This letter and its attachments are provided to address Confirmatory Issue 58 in Perry SSER/5 (Section 6.2.8), and to confirm that the lowest service metal temperatures of the reactor containment pressure boundary satisfy GDC 51.

Attachment 1 to this letter summarizes permissible lowest service metal temperatures for limiting components of the containment boundary. Material certifications are provided for limiting materials discussed. It is concluded that the permissible temperatures are satisfied under all conditions.

If you have any questions, please feel free to call me.

Very truly yours,

Murray R. Edelman
Vice President
Nuclear Group

MRE:jj

DW94/M/1

Attachments

cc: Jay Silberg, Esq.
John Stefano
J. Grobe

8502250481 850218
PDR A DUCK 05000440
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Boo!
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TECHNICAL BASIS FOR PNPP
COMPLIANCE WITH GENERAL DESIGN CRITERION (GDC) 51

Limiting ferritic materials in the Perry containment pressure boundary have been identified for compliance with GDC 51. Section 6.2.7 of the Standard Review Plan (NUREG-0800) provides the basis for making this determination. Two methods are described: (1) fracture toughness test in accordance with the ASME Code, or for materials not so tested, (2) correlate material properties to NUREG-0577 and determine lowest service temperature in accordance with referenced code provisions. Perry containment materials satisfy ASME Code criteria for impact testing. In addition, the more conservative method of correlation to NUREG-0577 yields acceptable results per Table 1.1.

The permissible temperatures in Table 1.1 have been determined for this evaluation in a manner not directly comparable to some values reported in the FSAR which are based on ASME required toughness tests.

The metallurgical characterization of these materials, when correlated with the data presented in NUREG-0577 and the Summer 1977 Addenda of the ASME Code Section III, provides the technical basis for the following determination of compliance.

Definition of Lowest Service Metal Temperature

Within the context of GDC-51 "lowest service metal temperature" is the limiting temperature which will be experienced by the materials of the containment pressure boundary when they are providing a pressure boundary during the performance of the containment function under operating, maintenance, testing and postulated accident conditions.

PLSMT = permissible lowest service metal temperature under conditions cited by GDC-51.

LSMT = Lowest service metal temperature postulated by design under conditions cited by GDC-51.

a. Containment Vessel/Equipment Hatch/Personnel Locks

(1) Containment Vessel; PLSMT = 50°F

SA 516 GR 70 4" thick shell inserts at penetrations is applied in the containment vessel. FSAR 3.8.2.6.1.2 presently identifies 50°F as the lowest service metal temperature anticipated. A more recent calculation is in close agreement (55°F). CMTR identifies the 4" material to have been normalized and tempered. S'77 Addenda Class 2 rules assign a Tndt of 0°F and a PLSMT of +50°F.

(2) Equipment Hatch/Personnel Air Locks; PLSMT = 55°F

The limiting material is identified as SA 516 GR 70 quenched and tempered, 6½" thick in the equipment hatch door flange. S'77 Addenda Class 2 rules assign a Tndt of -10°F and a PLSMT of +55°F to the material.

b. Penetrations

(1) Sleeves; PLSMT = +25°F (SA 333 GR 6); +30°F (SA 155 KCF 70)

SA 333 GR 6 normalized, 12-3/4" x 1" NW in Penetration #104 is identified as limiting. NUREG-0577 would categorize the material as C-Mn to which Table 4.4 would assign a (NDT + 1.3 σ) NDT of -5°F. S'77 Addenda Class 2 rules assign a PLSMT of +25°F.

SA 155 KCF 70 applying SA 516 GR 70, normalized, 1" NW, is identified (TYP) as applied in main steam penetration guard pipe. S'77 Addenda Class 2 rules assign a Tndt of 0°F and a +30°F PLSMT to the material.

(2) Process Pipe; PLSMT = 70°F

SA 106 GR B, 20" x 380 (1.031)" NW, normalized, applied in feedwater penetrations (Pl21 TYP) is identified as a limiting material. NUREG-0577, Table 4.4, via Fig. B-7, would assign a Tndt at or below the NDT of +40°F. Given a Tndt of 40°F, S'77 Addenda Class 2 rules assign a PLSMT of +70°F.

HPCS(E22) pressure boundary piping, SA 106 GR B:

12-3/4"x0.688" NW, N1698: NUREG-0577, Table 4.4 would assign a Tndt at or below the +40°F NDT. Assuming a +40°F Tndt, S'77 Addenda Class 2 rules assign a PLSMT of +70°F.

90° Ell, N1222 and N948: Ladish normalizes, and Crane mill practice discharges pipe to cooling, at 1650°F. Both materials are assumed normalized. NUREG-0577, Table 4.4, would assign a Tndt at or below the +40°F NDT. Assuming a +40°F Tndt, S'77 Addenda Class 2 rules assign a PLSMT of +70°F.

Sch 100 pipe, N1032: Phoenix Steel pipe mill practice discharges pipe to cooling beds above the A₃ temperature. The material is assumed normalized. NUREG-0577, Table 4.4, would assign a Tndt at or below the 40°F NDT. Assuming a +40°F Tndt, S'77 Addenda Class 2 rules assign a PLSMT of +70°F.

Sch 80 penetration process pipe, SA 106 B: see N1698 above.

(3) Flued Head Closure; PLSMT = +35°F

Limiting material applied in flued head closures is identified as SA 105, normalized, 3" design axial thickness, of feedwater penetrations (P121 TYP). NUREG-0577, Table 4.4, assigns a (NDT + 1.3σ) NDT of -5°F. Assuming a Tndt of -5°F, S'77 Addenda Class 2 rules would assign a PLSMT of +35°F to the material.

(4) Flat Plate Closure; PLSMT = +30°F

The limiting material applied in flat plate closures is identified as SA 516 GR 70, 3/4" thick, normalized, to which S'77 Addenda Class 2 rules assign a Tndt of 0°F and a PLSMT of +30°F.

c. Main Steam/Main Feedwater System Piping

The main steam/main feedwater system piping between containment penetrations and isolation valves are pipe spool pieces, including no fittings, procured to SA 106 GR B as addressed in Item b (2) above.

d. Isolation Valves

(1) Main Steam Isolation Valves (26" SN 5-560 TYP);

Body: SA 216 GR WCB normalized and tempered, 1-15/16" min. design wall. NUREG-0577, Table 4.4, assigns a PLSMT=65°F (NDT + 1.3 σ) NDT of +57°F and a NDT of +35°F to the material as identified for 2½"-5" thick. material. Given its 1-15/16" thickness, the Tndt of the material should lie in that population below the 35°F NDT. Assuming a Tndt of +35°F, S'77 Addenda Class 2 rules would assign a PLSMT of 65°F to the material.

Poppet: SA 350 GR LF 2, quenched and tempered, 6-1/8" min. design wall. NUREG-0577 would categorize the material as C-Mn, comparable to SA 105. NUREG-0577, Table 4.4, assigns a NDT of -28°F to normalized material. The Tndt of quenched and tempered material can be expected to lie in the population below -28°F. Assuming a Tndt of -28°F, S'77 Addenda Class 2 rules would assign a PLSMT of +34°F to the material.

Cover: SA 105, quenched and tempered, 5-15/16" min. design thickness. The analysis applied for the poppet would assign a PLSMT of +32°F to the material.

Bolting: Studs: SA 540 GR B23 Class 5
Nuts: SA 540 GR B23 Class 5
NUREG-0577, Table 4.6 categorizes this material as having least susceptibility to brittle failure.

(2) Main Feedwater Isolation Valve (Borg-Warner SN 51691);

Body: SA 216 GR WCB (Pacific Metals) annealed (5 hrs. @ 900°C + F.C.): 3.11" min. wall.
PLSMT=120°F NUREG-0577, Table 4.4, assigns a (NDT + 1.3 σ) NDT of +57°F to 2½"-5" A 216, normalized and tempered. Since, however, the material in question was annealed its Tndt would be expected to be higher. Steel Castings Handbook data indicate an approximate 40% difference in Cv energy between normalized and annealed A 216 WCB. Assuming a comparable degradation in Tndt and a (NDT + 1.3 σ) NDT of +57°F (from NUREG-0577, Table 4.4) an estimated Tndt of +80°F is assigned to the annealed SA 216 GR WCB. On this basis, S'77 Addenda Class 2 rules would assign a PLSMT of +120°F to the material.

Retainer: SA 105, normalized 2" thick. NUREG-0577, Table 4.4, assigns a (NDT + 1.3 σ) NDT of -5°F. S'77 Addenda Class 2 rules assign a PLSMT of 25°F.
PLSMT=25°F

Bonnet: SA 216 GR WCB (Pacific Metals) annealed (5 hrs. @ 900°C + F.C.): 3.083" min. wall. A PLSMT of +120°F is assigned to the material on the basis of the analysis for the body.
PLSMT=120°F

(3) Main Feedwater Isolation Check Valve (1B21-F032B);

Body: SA 216 GR WCC, normalized, 1.89" min. design wall. NUREG-0577, Table 4.4, based on Fig. B-2 data, would assign a Tndt in the population at or below the NDT of +35°F for 2½"-5" thick material. Given a Tndt of +35°F, S'77 Addenda Class 2 rules would assign a PLSMT of +65°F.
PLSMT=65°F

Cover: SA 105, normalized and tempered, 3.23" thick. NUREG-0577, Table 4.4, assigns a (NDT + 1.3 σ) NDT of -5°F. S'77 Addenda Class 2 rules assign a PLSMT of +35°F.
PLSMT=35°F

Disc: Not containment pressure boundary.

* Steel Castings Handbook, Fourth Edition, Steel Founders' Society of America, p. 489.

(4) HPCS Isolation Valve (1E22-F004);

Body: SA 216 WCB by Vulcan Steel Foundry: normalized, .97" min. design wall. NUREG-0577, Table 4.4, would assign a -6°F Tndt for 1" material. Given a Tndt of -6°F, S'77 Addenda Class 2 rules would assign a PLSMT of +24°F.

PLSMT=24°F

Bonnet: SA 216 WCB by Vulcan: normalized, 2" min. design thickness. NUREG 0577, Table 4.4, would assign a 35°F Tndt. S'77 Addenda Class 2 rules would assign a PLSMT of +65°F.

PLSMT=65°F

Disc: SA 216 WCB: normalized, 1-3/8" min. design thickness. Analysis for bonnet applies.

Bolting: A 193 B7 studs, SA 194-2H nuts: NUREG-0577, Table 4.6, categorizes these materials as having least susceptibility to brittle fracture.

CMTR's are attached for items discussed above; page numbers in the lower right hand corner are keyed to section numbers above:

	<u>Pages</u>
Containment vessel shell inserts	a(1)-1,2
Equipment hatch door flange	a(2)-1,2,3
Penetration sleeves: P104	b(1)-1,2,3
P122	b(1)-4,5,6
Process pipe: feedwater	b(2)-1,2
HPCS	b(2)-3,4,5,6
Flued head closure	b(3)-1,2
Flat plate closure	b(4)-1,2
MSIV	d(1)-1 through 11
Feedwater isolation valve (SN 51691)	d(2)-1 through 6
Feedwater isolation valve (1B21-F032B)	d(3)-1,2,3
HPCS isolation valve (1E22-F004)	d(4)-1 through 9

DW94/M/7/kaw

TABLE 1.1 - SERVICE TEMPERATURE VS LOWEST PERMISSIBLE TEMPERATURE

<u>Containment Vessel</u>	<u>PLSMT</u> ⁽¹⁾	<u>LSMT</u>	<u>Remarks</u>
1. Containment vessel (FSAR 3.8.2.6.1.2)	50°F	55°F	Minimum calculated annulus temperature.
2. Equip. Hatch/Pers. Air Locks (FSAR 3.8.2.6.1.2e)	55°F	55°F	
<u>Penetrations</u>			
1. Penetration sleeves (FSAR 3.8.2.6.1.2c)	30°F 25°F	55°F	
2. Feedwater pipe HPCS pipe	70°F 70°F	(2) 82°F	(3)
3. Flued head closures	35°F	55°F	
4. Flat plate closures	30°F	55°F	
<u>Isolation Valves</u>			
1. Main Steam Isolation Valves	65°F 34°F 32°F	100°F	System hydrotest
Feedwater Isolation Valves:			
2. 1B21F065A&B (gate)	120°F	130°F	All operating conditions(4)
3. 1B21F032A&B (check)	65°F 35°F	130°F	All operating conditions; 10 year hydro @ 120°F
4. High Press. Core Spray	65°F 24°F	82°F	(3) (3)

(1) PLSMT = permissible lowest service metal temperature. LSMT = design minimum service metal temperature.

(2) 100°F inboard of maintenance isolation valves 1N27F560A&B, 130°F outboard excepting 10 year hydros at 120°F.

(3) FSAR Table 3.11-3, minimum under pressurized conditions in Zone AB-8.

(4) At or above 130°F before valve is subjected to 20% of hydro test pressure per Figure 3.4.6.1-1 in technical specifications. Valves will be ASME XI hydro tested at or above 120°F.

DW94/M/8/kaw



Newport News Industrial Corporation

Subsidiary of Newport News Shipbuilding

A Tenneco Company

SHIP-OUT INSPECTION REPORT

FINAL INSPECTION OF MATERIAL LISTED HAS BEEN COMPLETED AND IS RELEASED FOR SHIPMENT				J.O.	FILE NO.
DWG. NO.	DWG. ITEM	P.O. ITEM	QTY	DESCRIPTION	
249732 Rev. A-3				Assy 99-2 Double Penetration Assy Horizontal Reinforced 4" Plate units 1 and 2 containment vessel.	
77 NNI 038	1		2	Sleeve Steel see assy 93 Dwg. 249703 Rev. B-3	
77 NNI 202	2		1	Reinf Plate 4"	
249703 Rev. B-3					
77 NNI 537	16		2	Half Coupling	

☒ COMPANY FURN. MAT'L.
☐ CUSTOMER FURN. MAT'L.
☐ OTHER

5025-A X12-214

INSPECTION DATE 2-28-78 DATE 5-8-78

N. N. I. O. MAY 9 1978

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Ferry Nuclear Power Plant

INFORMATION ONLY - Contract No. P-1114-1

**Cleveland Electric Illuminating Co.
Ferry Nuclear Power Plant**

INFORMATION ONLY 7/10/2, Contract No. P-1114-1

APPLICABLE INSPECTIONS		APPLICABLE DATA	
EACH CHECKED INSPECTION HAS BEEN PERFORMED ON EACH ITEM LISTED ABOVE		NNI CHARGE/P.O./J.O. NO.	NNI SHIPMENT NO.
VISUAL INSPECTION <input checked="" type="checkbox"/> MARKING <input checked="" type="checkbox"/> SURFACE CLEANLINESS <input type="checkbox"/> GRADE _____ <input type="checkbox"/> AS REC'D FOR SHIPOUT <input type="checkbox"/> PRIM. CLEAN TAG. <input type="checkbox"/> PLUG WARNING TAG	DOCUMENTATION: <input type="checkbox"/> MANUFACTURE CERT. <input type="checkbox"/> SHIPPING PAPERS <input type="checkbox"/> EQUIPMENT HISTORY	SHIPPED TO _____	
DIMENSIONAL INSP. <input checked="" type="checkbox"/> WELD PREP <input checked="" type="checkbox"/> OVERALL	OTHER (SPECIFY) _____	ENGINEERING INSTRUCTION	REV.
	SHIPPING TRANSPORTATION	QA INSPECTOR	DATE
	REMARKS <i>R Kelly</i>	CUSTOMER INSPECTOR	DATE
		AUTHORIZED INSPECTOR	DATE

DISTRIBUTION:

 $a(1) = 1$

PHOENIX EL CORPORATION

CLAYMONT, DELAWARE

ASME SA 516 GR 70 (ASME DESIGNATION A516-73 GR 70) NORM. & IMPACT TESTED
IN ACCORDANCE WITH REQS. OF ARTICLE NE-2000 SECT III THRU
1974 AGENDA & SUPL. REQS. OF SS-OFSA-20
CHEMICAL AND PHYSICAL TESTS OF Silicon Quality Steel

CLAYMONT, DEL. March 4, 1977

CUSTOMER'S ORDER NO. 5025-A-96

MILL ORDER NO. 28893-26

CAR NO. PC 580373

Bend Test
OK

Homogeneity Test

TO Newport News Industrial Corp.

Newport News, Va. 23607

SLAB
No.

SERIAL
No.

CHEMICAL ANALYSIS

TEST PIECE

Carb.

Mang.

Phos.

Sulph.

Si.

Cu.

Ni.

Cr.

Mo.

Thickness

Sec. Area

Yield
Point lbs.
Per Sq. In.

Tensile
Strength
lbs. Per
Sq. In.

%
Elong.
In
2 in.

SIZE

87817-26 88109

.20

1.08

.007

.021

.26

Long Charpy V-Notch Impact
Tested @ 0 DEG.F.

L-51-42-53

.505

51000

74500

39.0

1- 4"x95x170 77NN1202
ITEM #6

MATERIAL IS FREE OF MERCURY CONTAMINATION

87817-26 88109

L. Exp. .049-.048-.042
% Shear 50%-50%-40%

PLATE AND TEST PC NORMALIZED AT 1600-1650 Deg.F., HELD FOR ONE HOUR PER INCH OF THICKNESS AND AIR COOLED.

INFORMATION ONLY

N. N. I. C. 395
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Carole M. Miller

SUBSCRIBED AND SWORN TO BEFORE ME

7th Day of March
Loren A. Mabrey
Notary Public

1 copy to E. Wright 3/8/77
S. Perry

I certify the above figures are correct as
contained in the records of the Corporation.

Phil R. Smith
Supr. of Testing, Metallurgical Dept.

ITEM NO.	QTY REQD	PART NO.	DESCRIPTION	MATERIAL	GRADE / TYPE	HEAT NO.	SLAB NO.	LOT NO.	BATCH NO.	INCL. / TION
1	6	33368-1	7x9x60° COLLAR SEGMENTS	SA-516	GR 70	D3078	1	A20948-3		33368
2	8	33368-2	PLATE - SEGMENT - 45°	SA-516	GR 70	D3062	3	A20948-2		33368
3	1	33368-3	DOLLAR PLATE	SA-516	GR 70	D3062	3	A20948-1		33368
5	2	33368-5	R 12"x1"x2'-0"	SA-516	GR 70	53219	7-2	A22658-2		33368
6	2	33368-6	R 8"x2 1/4"x1'-7 1/8"	SA-516	GR 70	A5034	2	A20952-5		33368
7	2	33368-7	R 8"x2"x2'-3 1/2"	SA-516	GR 70	A5034	2	A20952-5		33368
9	4	33368-9	R 12"x1"x1'-0"	SA-516	GR 70	D3062	3	A20952-4		33368
10	1	33368-10	R 10"x1/2"x0'-11"	SA-516	GR 70	B0999	3A	A22978-5		33368
11	4	33368-11	R 8"x3/4"x0'-9 1/4"	A-36	—	12773		A18822-3		33368
12	2	33368-12	R 9 1/4"x3/4"x0'-9 1/4"	A-36	—	12773		A18822-3		33368

MURDOCK, INC.

DRAWING CONTROL
DIVISION II

COPY NO. 3

DATE

5-9-78

EFFECTIVITY

3-1671-03

J/S

WOL

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COMPLETED DRAWING REVIEWED
AND ACCEPTED BY: Boalman 5-478
QUALITY ENGR

THIS DWG FORMS PART OF THE AS CONSTRUCTED DRAWING

DRAWN	DATE
<u>D. Callan</u>	5-4-78
CHECKED	
APPROVED	
UNLESS OTHERWISE SPECIFIED DIMENSIONS APPLY AFTER PLATING REMOVE ALL BURRS BREAK ALL SHARP EDGES 50% R	
TOLERANCES	DECIMALS ± .005 FRACTIONS ± .005 ANGLES ± .005

MURDOCK, INC.

15000 So. Avalon Compton, California 90220 Phone 770-022 (213)

NAME BILL OF MATL, HATCH COVER
S/N 33366

CUSTOMER NUMBER REV.
WOOLLEY ACD-33368 N/C

JOB NO 3-1671 SCALE NONE SHEET 1 OF 1

ACD-33368

21

a(2)-1

KAISER

KAISER STEEL CORP.
FABR. DIV., PUR. AGENT
P.O. BOX 95
FONTANA, CALIF. 92335

COASTVILLE, PA. 15002
TEST CERTIFICATE

WELL ORDER NO.

70666-1

CUSTOMER P.O.

45131201

MP 6376 DD
1/14

DATE: 6-7-76

FILE NO. 4205-02-01

CONSIGNEE
KAISER STEEL CORP.
PLANT #1
13032 SLOVER AVE.
KAISER, CALIF.

A. J. Stone

Revised Copy 3-29-77

ALL MATERIAL MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

SA-516 GR. 70 ASME CODE SECT. II & III SUB. NE 1974 EDITION THRU SUMMER 1974 ADDENDUM 15 1977

N-1160 8/4/78

WELD TEST C. K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

WELD NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	Ti	XXR	XXR	GRAIN SIZE	BASIC PROC.
03078	26	1.14	.012	.005			.22					VIP	STEEL	7-8	ELEC

Please destroy other test report previously sent.
This is a revised copy.
Reason: Added decimal points and mercury clause per customer request.

MURDOCK INC.

LOT # A20948-3

JOB # 4191 2-1671-01

DATE 3-8-77

PHYSICAL PROPERTIES

WELD NO.	SLAB NO.	YIELD STRENGTH	TENSILE STRENGTH	% ELONG.	% RA	BHN	IMPACTS V 0°F.	FRACTURE APPEARANCE & SHEAR	DESCRIPTION
03078	1	590 595	815 805	30 29			T 43 42 42 L110 108 110 T.038 .037 .038 L.086 .088 .087	40-40-40 90-90-90	1- 7" x 102 x 132

LATERAL EXPANSION IN INCHES

Mercury or mercury compounds are not used in the manufacture of Luken's products.

PLATE AND TESTS HEATED TO 1625°F./1675°F., HELD 1/2 HR. PER INCH MIN. AND WATER QUENCHED, THEN TEMPERED 1200°F., HELD 1/2 HR. PER INCH MIN. AND WATER QUENCHED.

TESTS STRESS RELIEVED BY HEATING WITHIN A RATE OF 100°F. PER HR. TO 1100°F./1150°F., HELD 30 HRS. AND FURNACE COOLED WITHIN A RATE OF 100°F. PER HR. TO 800°F.

NUCLEAR
M.I.R. REVIEWED AND ACCEPTED
4-12-77

1312
1312

A. J. Stone

**KAISER
STEEL**

METAL PRODUCTS DIVISION
P O BOX 45 C FONTANA CALIFORNIA 92331
TELEPHONE 825 3350

CERTIFICATE OF COMPLIANCE

December 22, 1976

Job 1312, Murdock, Inc. M-14453.

We hereby certify that all heat treating performed by KAISER STEEL CORP. on above work order was in accordance with ASME Code, Section III, 1974 Edition, Summer 1974 Addenda, Class IIC, Subsection NE and Job 1312 Normalizing Procedure - revised 8-18-76.

KAISER STEEL CORP.
Metal Products Division

Gregory Shepherd

Gregory Shepherd, Inspector
Fontana Plate Fabricating.

2-10-77

MURDOCK INC.	
LOT #	<u>A20940-3</u>
JOB #	<u>WOL 3-1671-01</u>
DATE	<u>2-9-77</u> (M 8)

EC 324 6 PCS
D 3078-1 PERMIT
a(2)-3

12/11/69

P104

Newport News Industrial Corporation

Subsidiary of Newport News Shipbuilding

Atlantic City, N.J.

SHIP-01
INSPEC
REPORT

DATE INSPECTION OF MATERIAL ENTERED				DATE OF SHIPMENT		<input checked="" type="checkbox"/> INSPECTION FURN. MAT'L. <input type="checkbox"/> CUSTOMER FURN. MAT'L. <input type="checkbox"/> OTHER		Q. NO.	5025-A	INSPECTION DATE	11-30-77
CR. NO.	PRO. ITEM	MAT. ITEM	QTY	DESCRIPTION							
249702 Rev. A-3				Assy 99-1 Six Sleeve Penetration Assy Special - Unit #1 Containment Vessel							
15 NNI 359	1		2	Sleeve Steel See Assy 90 Dwg. 249703							
6 NNI 310											
6 NNI 313	2		2	Sleeve Steel See Assy 88 Dwg. 249703							
6 NNI 240	3		1	Sleeve Steel See Assy 95 Dwg. 249703							
15 NNI 326	4		1	Insert Plate 1 1/2"							
6 NNI 326	5		1	Reinf Penetration Assy. see assy Dwgs. 249721 Rev. A-3 see assy 92 Dwg. 249703 Rev. B-3							
249703 Rev. B-3 1 537	16		6	Half Couplings							

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TO: INSPECTION <input type="checkbox"/> MANUFACTURE CERT. <input type="checkbox"/> INSPECTION RECORDS <input type="checkbox"/> EQUIPMENT HISTORY OTHER (SPECIFY):		REPLICATED BY: CHECKED BY: <i>CLARENCE HARRIS, JR.</i> REPLY TO: <i>CLARENCE HARRIS, JR.</i> NAME OF INSPECTION: <i>N/A</i> INSPECTION NO.: <i>1-2-77</i> INSPECTION DATE: <i>11-30-77</i> INSPECTION LOCATION: <i>N/A</i> INSPECTION METHOD: <i>N/A</i>	
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SHIP. NO. 5025-A-2
SHEET 2 OF 9

b(1)-1

INFORMATION ONLY

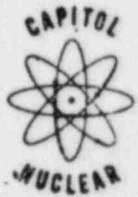


Capitol

PIPE & STEEL PRODUCTS CO.

DIVISION OF FAS INTERNATIONAL, INC.

301 CITY LINE AVENUE • AREA CODE 215 • TE 9-4300
BALA-CYNWYD, PENNSYLVANIA 19004



CAPITOL PIPE CERTIFICATE OF COMPLIANCE

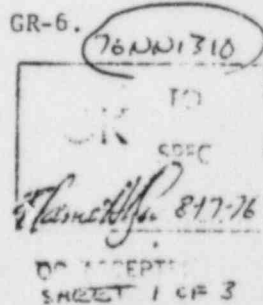
ASME QUALITY SYSTEM CERTIFICATE (MATERIALS) NUMBER N-936

EXPIRATION DATE: JANUARY 6, 1978

MATERIAL: 12-3/4" OD X SCH 120 ASME SA-333 GR-6.

HEAT NO: 65326

MANUFACTURER: PHOENIX STEEL CORP.



This Certification affirms that the content of the attached report (s) is correct and accurate and that all test results and operations performed are in compliance with the below listed Specifications:

- 1) ASME Code Section II 1974 Edition including addenda through Summer 1974.
- 2) ASME Code Section III 1974 Edition including addenda through Summer 1974 for Class MC Materials.

REFERENCE:

NEWPORT NEWS P.O.# 50256A-64
CAPITOL S.O.# PN-2477-A
ITEM# 1

23 July 77
Murray Herbert Feldman

N. N. I. C. 858
RECORD CENTER
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B. J. ...
QUALITY ASSURANCE

QUALITY ASSURANCE

b(1)-2

Newport News Ind.
P.O. 5025-A-64
S.O.# PN-2477-A
Ch# N-00943

Item# 1

PHOENIX STEEL CORPORATION

TUBE DIVISION
PHOENIXVILLE, PENNA.

CERTIFICATE OF INSPECTION AND TESTS

DATE: 6-14-73 DATE SHIPPED: 6-10-76 MILL ORDER NO. 12" S/120 SA 6
CUSTOMER ORDER NO. T-8986-C (54D)
CAR NO. 77653-00
RDG 38869
MATERIAL: SEAMLESS ☐ PIPE ☐ TUBE, HOT FINISHED
SPECIFICATION: ASTM A-333-75 Gr. 6, ASME SA-333 Gr. 6 (O.H.)
SOLD TO: Capitol Pipe & Steel Prod., Inc.
Div. of FAS International, Inc.
P. O. Box 471
Bala Cynwyd, Pa. 19004
SHIP TO: 76NN1310 N. N. I. C. 286
RECORD CENTER
FILE COPY
NO. PCS. 00 WALL LENGTH TOTAL FT. TOTAL WT. 65326 HEAT NO.
12.750" x 1.000"
Longitudinal Vee Notch Charpy at minus 50°F. (10mm x 10mm)
Foot lbs. 100-46-28
Lateral Expansion .096 - .040 - .030
Percent Shear 50-30-20

HEAT NO.	C	Mn.	P.	S.	Si.	Cu.	Ni.	Cr.	Mo.	V.
65326	.11	1.00	.011	.027	.18					
65326	.14	.98	.011	.028	.19					
65326	.11	.98	.012	.029	.18					

Ladle Analysis
Product Analysis
Product Analysis

OK TO
SHIP

Handwritten signature and date: 8-17-76

SHEET 3 OF 3

HEAT NO.	TENSILE (KSI)	YIELD (KSI)	% ELONG. IN 2"	% RA	ROCKWELL C	HARDNESS BRINELL	GRAIN SIZE
65326	62.5	46.0	36.00				

Normalizing. Equalized at 1650°F. plus 25°F. minus 50°F. Held for 1 hour and air cooled. (.505" Test Specimen)

SWORN TO AND SUBSCRIBED BEFORE ME THIS 14TH DAY OF JUNE 1976.

WALTER V. LAMAR, JR., Notary Public
PHOENIXVILLE BOROUGH, CHESTER COUNTY
MY COMMISSION EXPIRES OCT. 29, 1979

JOINT DISTANCE - 16TH ROCKWELL C FLATNESS OK HYDROSTATIC PSI 2800

1 2 4 6 8 10 12 14 16 20 24 28 32

THE PHOENIX STEEL CORPORATION HEREBY CERTIFIES THAT THE ABOVE MATERIALS HAVE BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE APPLICABLE SPECIFICATIONS AND THE RESULTS OF SUCH INSPECTION AND TESTS AS CONTAINED IN THE COMPANY'S RECORDS ARE AS SHOWN ABOVE. FOR PROPERTIES OR CHARACTERISTICS FOR WHICH NO METHODS OF INSPECTION OR TESTING ARE PRESCRIBED BY SAID SPECIFICATIONS, THE STANDARD MILL INSPECTION AND TESTING PRACTICES OF THE PHOENIX STEEL CORPORATION HAVE BEEN APPLIED. BASED UPON SUCH INSPECTION AND TESTS, THE ABOVE MATERIALS HAVE BEEN APPROVED AS FULFILLING THE REQUIREMENTS OF SAID SPECIFICATION.



Newport News Industrial Corporation
Subsidiary of Newport News Shipbuilding
A Tenneco Company

SHIP-OUT INSPECTION REPORT

P122

FINAL INSPECTION OF MATERIAL LISTET
HAS BEEN COMPLETED AND IS RELEASED FOR SHIPMENT

☒ COMPANY FURN. MAT'L
☐ CUSTOMER FURN. MAT'L
☐ OTHER

5025-A
8-25-77
8-25-77

QTY	DESCRIPTION	P.O. ITEM	QTY
1	AB499-1 Gasket Penetration Assy. Course #7 the following SHELL PLATE	1	1
2	SLEEVES are Qty 249703 Rev. B-3	2	4
16	4 HRF COUPLING.	16	

AUG 29 1977
N. N. I. C.
RECORD CENTER
FILE COPY

THIS COMPLETES (PARTIALLY COMPLETES) _____ REV. _____
THIS CLEARS (PARTIALLY CLEARS) NR _____ DATED _____

APPLICABLE INSPECTIONS		APPLICABLE DATA	
EACH CHECKED INSPECTION HAS BEEN PERFORMED ON EACH ITEM LISTED ABOVE		NMI CHARGE/P.O./J.O. NO. 5025A	
<p>VISUAL INSPECTION</p> <p><input checked="" type="checkbox"/> MARKING</p> <p><input checked="" type="checkbox"/> SURFACE</p> <p><input checked="" type="checkbox"/> CLEANLINESS</p> <p><input type="checkbox"/> GRADE _____</p> <p><input type="checkbox"/> AS REC'D FOR SHIP/OUT</p> <p><input type="checkbox"/> PRM. CLEAN TAG.</p> <p><input type="checkbox"/> PLUG WARNING TAG</p> <p>DIMENSIONAL INSP.</p> <p><input checked="" type="checkbox"/> WELD PREP</p> <p><input checked="" type="checkbox"/> OVERALL</p>		<p>DOCUMENTATION</p> <p><input type="checkbox"/> MANUFACTURE CERT.</p> <p><input type="checkbox"/> SHIPPING PAPERS</p> <p><input type="checkbox"/> EQUIPMENT HISTORY</p> <p>OTHER (SPECIFY) _____</p>	
<p>SHIPPING TRANSPORTATION</p> <p><i>Opelley</i></p>		<p>SHIPPED TO CLEVELAND ILLUM. PERRY SITE CLEVELAND, OHIO</p> <p>ENGINEERING INSTRUCTION N/A</p> <p>QA INSPECTOR D.J. Day</p> <p>CUSTOMER INSPECTOR N/A</p> <p>AUTHORIZED INSPECTOR N/A</p>	
		<p>REVISIONS</p> <p>DATE 8-25-77</p> <p>DATE</p> <p>DATE</p>	

DISTRIBUTION:

1. Record Center NMI
1. J.H. Brown #10



1 OF 5

b(1)-4

INFORMATION ONLY

PURCHASER:

3. NEWPORT NEWS INDUSTRIAL CORP.
QUALITY ASSURANCE MANAGER
12388 WARWICK BLVD.
NEWPORT NEWS, VA. 23606

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 7-16-76

FILE NO 7791-04-01

CONSIGNEE:

MILL ORDER NO.

70941-2

CUSTOMER P.O.

5025-A-63

MP 71076 DM
5/21

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

SA-516 GR. 70 S5 ASME CODE SECT. II & III SUB NE 1974 EDITION THRU SUMMER 1974 ADDENDA
N-1160 8/4/78 MOD. FOR IMPACTS

BEND TEST O.K. HOMOGENEITY TEST

SHEET #1 OF 2

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	NI	CR	MO	V	TI	AL	B	GRAIN SIZE
C6894	22	93	012	018		21							7-8
D2977	21	1.07	012	017		25							7-8
A4859	24	1.04	004	021		25							7-8
D3161	22	1.00	009	020		23							7-8
C6913	21	1.04	012	020		21							7-8
D3163	22	1.04	007	020		24							7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	IMPACTS LV 8°F.	FRACTURE APPEARANCE	DESCRIPTION	ITEM #
C6894	11B	450	743	27			71 70 72 LATERAL EXPANSION IN INCHES .069 .066 .068	70-70-70	1- 1-1/2" X 90 X 205 76NNI238	2
D2977	7U	452	755	30			68 70 70 LATERAL EXPANSION IN INCHES .066 .067 .064	70-70-70	1- 1-1/4" X 60 X 188 76NNI239	3
A4859	3T	456	780	28			58 60 56 LATERAL EXPANSION IN INCHES .052 .055 .051	50-50-50	1- 1-1/8" X 60 X 225 76NNI240	4
D3161	7A	515	736	29			70 70 66 LATERAL EXPANSION IN INCHES .062 .066 .065	70-70-70	1- 1" X 90 X 366 76NNI241	5

We hereby certify the above information is correct.

SUPERVISOR TESTING

A. J. Kline

b(1)-5

INFORMATION ONLY

PURCHASER:

NEWPORT NEWS INDUSTRIAL CORP.
NEWPORT NEWS, VA. 23606

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE 7-16-76

FILE NO 7791-04-01

CONSIGNEE,

MILL ORDER NO.

70941-2

CUSTOMER P.O.

5025-A-63

5/22

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS.

SAME

BEND TEST

O.K.

HOMOGENEITY TEST

SHEET #2 OF 2

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B		

N. N. I. C. 269

RECORD CENTER

FILE COPY

OK TO SPEC

Handwritten: 8-4-76

QC ACCEPTED

SHEET 2 OF 2

PHYSICAL PROPERTIES

PHYSICAL PROPERTIES												
MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8	% R.A.	BHN	V/FACTS LV 0°F.			FRACTURE APPEARANCE	DESCRIPTION	ITEM #
C6894	13T	493	732	26			71	70	70	% SHEAR 70-70-70	1- 1" x 60 x 341 76NN1242	6
							LATERAL EXPANSION IN INCHES .066 .057 .066					
C6913	16B	521	768	27			80	78	80	80-80-80	1- 1" x 92 x 247 - 76NN1243	7
							LATERAL EXPANSION IN INCHES .076 .075 .077					
D3168	3F	500	755	24			86	88	88	90-90-90	1- 3/4" x 90 x 240 76NN1244	8
							LATERAL EXPANSION IN INCHES .086 .085 .084					
PLATES AND TESTS NORM. 1625-1675°F., HELD 1/2 HR. PER INCH MIN. AND AIR COOLED.												

We hereby certify the above information is correct.

SUPERVISOR TESTIMONY

F. R. Ling

714/2315

20-70-1004 20 T-21 T-24

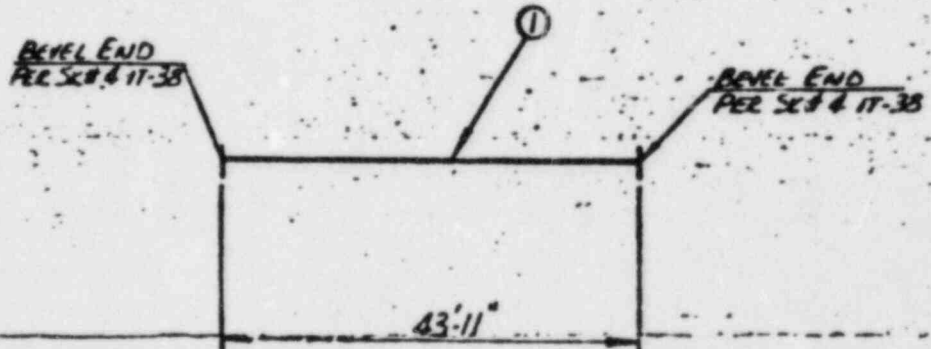
NOTES

1. ASME SECTION III CLASS 1
2. QUALITY ASSURANCE REQUIRED
3. ALL WELDED SURFACES TO BE COATED WITH DEON-ALL WHITE

**IMPACT TEST
PROPERTIES REQD**

① 5. NO SHOP PAINT

DATE: 11/16/81	BY: P. J. 21	2405	F-24711/
SYSTEM: N21-FEEDWATER		JOB NO.	SHEET NO. 207
REF. Dwg: A-312-401 4/6 & B-312-650 4/7			
EST. WT.	INSPECTION	REVEL ENDS	CLEAR
9175		AS NOTED	AS NOTED



PERBY NUCLEAR POWER PLANT UNIT 1
THE GEORGE W. BELL NUCLEAR CO.
ENGINEERING DEPT. 1000 EDITION CO.
P.O. BOX 1000 EDITION CO.
CONTRACT NO. P-1144
PURCHASE ORDER NO. _____

LINE SPEC: DI-1

1 10/16/81 ✓			ADD INTO S.E.		20" PIPE ASSEMBLY		LINE SEC. 01-1		Pulman KeKong Division of Pulman Incorporated						
REV.	DATE	BY	DESCRIPTION			COLOR CODE:	SPOTS-BAND	SPRIN.	CH. S.	APPRO. S.					
								1/2"	1/2"	1/2"					
CAP & STL ASSY						MATERIAL					PRICING DETAILS				
ITEM	QTY.	DESCRIPTION					SPEC.	SOURCE	UNIT	TOTAL	DIST.	NET			
1	1	20" SMLS. PIPE PER S.E.					1/2"								
2	2	20" - End Protector with 48 bolts of S.E. 1000 EDITION CO. XIII-3					1/2"	STOCK							

CERTIFICATE OF TEST ON PIPE MATERIAL

SUPPLEMENTARY REPORT

3/10/77

Cameron

IRON WORKS, INC.

P. O. BOX 1212
HOUSTON, TEXAS 77001

PULLMAN KELLOGG
POWER PIPING
P. O. BOX 1007
WILLIAMSPORT, PA 17701

Date 24 May 1977

C. I. W. Order No.

8405-163

C. I. W. Order No.

F-9053

Specification

ASME SA106 Gr. B Sec. III Class I with Kellogg
Spec. IV-18; IV-33 & VIII-1 W/ Impacts at +30°F.

Description
of Material

O.D. 20"

I.D.

WALL

SCH. 80

C. I. W. Part No.

86-9053-200-180

ASME QUALITY SYSTEM CERTIFICATE (MATERIALS)
NO. N-1261 EXPIRES 10-27-78.

Heat No.

Location
or Serial No.

CHEMICAL ANALYSIS

C	MN	P	S	SI	CR	NI	MO
.24	.89	.025	.025	.27			

L 3768

PULLMAN KELLOGG
QUALITY ASSURANCE
CMTR APPROVED
6/1/77 BY *JM*
6/8/77 BY *JB*

THIS MATERIAL CERTIFIED TO

1974 ASME CODE.

6/75 ADDENDA.
SECTION II

PULLMAN KELLOGG
QUALITY ASSURANCE DEPARTMENT
BY *JM* DATE: 6/1/77

Quantity
or Serial No.

Heat No.

Test
Loc.

Yield
PSI

.2 % Offset
Yield
PSI

% Elong.
2 in.

% Red.
Area

Test Lot#

Flare
Test

V-Notch Impact +30°
Ft.Lbs. Lat.Exp. %D/
65.0 59 71LS 72%
64.0 54 58
56.0 50 58

3

L 3768

trans.

74,900

41,700

28.1

53.3

* 957

OK

Tensile specimen size:
.505

Each length of pipe 100% ultrasonically inspected in accordance with CIW PU-41 W/Add. #9053 and found acceptable. Report attached.

* IMPACT SPECIMENS WERE REMOVED AXIALLY WITH CENTER AXIS 1/4 T FROM O.D. & NOTCHED RADially.

Forging
Ser. #
22387
28583
28590

Best
Lot#
957
957
957

Hydrostatic Test Each length of pipe hydrostatically tested at 1900 psi f. - 5 sec. and found acceptable

Heat Treatment:

1550°F. held 1 hr. at temp. Air cooled.

Heat Treat Charts attached.

Subscribed and sworn to before me this
24th Day of May 1977

Notary Public

I certify these tests to be correct as contained in the records of the company.

Metallurgical Representative H. D. WRIGHT, Inc

CERTIFICATE OF INSPECTION AND TESTS

**SUPPLEMENTARY COPY 11-18-77

DATE: 11-7-77	DATE SHIPPED: 11-7-77	MILL ORDER NO. T-3876-A2	SHIPPING LIST # 19
Standard Pipe & Supply Co., Inc.		CUSTOMER ORDER NO. 307 ADD#1	
		CAR NO.	
Pullman-Power Products		MATERIAL: SEAMLESS <input checked="" type="checkbox"/> PIPE <input type="checkbox"/> TUBE, NOT FINISHED	
		SPECIFICATION: ASME SA-106-B F.G. (O.H.) NORM.	

NO. PCS.	OD	WALL	LENGTH	TOTAL FT.	TOTAL WT.	HEAT NO.
	12.750"	x .688"				57016
Longitudinal Vee Notch Charpy at Plus 30°F. (10mm x 10mm)						35-37-49 ft.lbs.
**LATERAL EXPANSION			**PERCENT SHEAR			
.037-.037-.046			30-30-40			

HEAT NO.	C	Mn.	P.	S.	Si.	CU.	Ni.	CA.	MC.	V.
57016	.22	.75	.012	.025	.23					
57016	.23	.81	.012	.025	.24					
57016	.23	.79	.012	.026	.23					

INFORMATION ONLY

CEI
PNPP
1 OF 2
P-1314L

HEAT NO.	TENSILE (KSI)	YIELD (KSI)	% ELONG. IN 2"	% RA	ROCKWELL	HARDNESS BRINELL	GRAIN SIZE
57016	71.6	43.0	48.00				

Normalized at 1650°F

THIS MATERIAL CERTIFIED TO
1974 ASME CODE
6/75 ADDENDA
SECTION II
PULLMAN POWER PRODUCTS
QUALITY ASSURANCE DEPARTMENT

PULLMAN POWER PRODUCTS
QUALITY ASSURANCE
CNTR APPROVED
11/21/77 BY JMM
11/21/77 BY JMM

DOCUMENT REVIEWED
BY 8202
PNPP
GAI/QA

JOINTLY DISTANCE 16mm	FLATTENING OK	HYDROSTATIC PSI 2300
1 2 4 6 8 10 12 14 16 20 24 28 32		

THE PHOENIX STEEL CORPORATION HEREBY CERTIFIES THAT THE ABOVE MATERIALS HAVE BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE APPLICABLE SPECIFICATIONS AND THE RESULTS OF SUCH INSPECTION AND TESTS AS CONTAINED IN THE COMPANY'S RECORDS ARE AS SHOWN ABOVE. FOR PROPERTIES OR CHARACTERISTICS FOR WHICH NO METHODS OF INSPECTION OR TESTING ARE PRESCRIBED BY SAID SPECIFICATIONS, THE STANDARD MILL INSPECTION AND TESTING PRACTICES OF THE PHOENIX STEEL CORPORATION HAVE BEEN APPLIED. BASED UPON SUCH INSPECTION AND TESTS, THE ABOVE MATERIALS HAVE BEEN APPROVED AS FULFILLING THE REQUIREMENTS OF SAID SPECIFICATION.

R. W. Beckwith
ENGINEER IN CHARGE

LADISH CO.

CUDAHY • WISCONSIN • 53110

Pullman Kellogg
Power Piping
P.O. Box 1007
Williamsport, PA 17701

METALLURGICAL MATERIAL ANALYSIS REPORT

734-11222

REVISED REPORT 6-18-77

DATE SHIPPED 6-23-77

DATE OF REPORT 6-29-77

ITEM	PCS.	SPECIFICATION					DESCRIPTION					CODE	HEAT NO.	
5	2	A193 SA334 WFB Per*					12 X 6 S/100 90 LR RED EL					A193G	168662	
C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	N	YIELD KSI	ULTIMATE KSI	% EL.	% RED.
.27	1.00	.008	.010	.16							48.4	71.5	36	

Ser. #'s 884 & 885.
*ASME Section III Class 2 1974 Edition thru Winter 1975 Addenda in addition PK IV 26 Rev. 8-12-76 and PK IV-33 Rev. 11-16-76.

CE 11213

ITEM	PCS.	SPECIFICATION					DESCRIPTION					CODE	HEAT NO.				
5	1	ASME SA234 WPB Per*					24 X 16 STD RED TEE					YL3GV	168662				
.23	.89	.005	.010	.18	Ni	Cr	Mo	Cu	V	N	YIELD KSI	ULTIMATE KSI	% EL.	% RED.			
ASME Spec. for Tee					Ser. #882.					45.4					69.9	33	54

Ser. #882.
*ASME Section III Class 2 1974 Edition thru Winter 1975 Addenda in addition PK IV-26 Rev. 8-12-76 and PK IV-33 Rev. 11-16-76.

CE 11222

ITEM	PCS.	SPECIFICATION	DESCRIPTION										CODE	HEAT NO.			
8	9	ASME SA234 WPG Per*	12 S/60 90 LR EL										YK3LG	168725			
C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	N	YIELD KSI	ULTIMATE KSI	% EL.	% RED.			
.24	.87	.008	.011	.19							45.7	70.2	33	87			
Ser. #'s 887 thru 895																	

Ser. #'s 887 thru 895.
*ASME Section III Class 1 1974 Edition thru Winter 1975 Addenda in addition PK IV-20 Rev. 8-12-76 and PK IV-33 Rev. 11-16-76.

INFORMATION ONLY

ITEM	CHARPY (SIZE)	V NOTCH	TEMP. °F	FOOT POUNDS	S SHEAR	LATERAL EXPANSION
8	10 X 10 X 8		+30	86 - 84 - 98	72 - 55 - 72	.074 - .070 - .050

PULLMAN POWER PRODUCTS
QUALITY ASSURANCE
CMTR APPROVED

ALL STARTING MATERIAL CONFORMS TO CHEMICAL ANALYSIS REQUIREMENTS OF ASME SA106 Gr. B Pipe.

ALL FITTINGS HAVE A MAXIMUM HARDNESS 7128/77 BY 30

FITTINGS CONFORM TO THE REQUIREMENTS OF MSS-SP-5

STARTING MATERIAL CONFORMS TO

MAGNETIC PARTICLE INSPECTED AND ACCEPTED PER LADISH PROC. 9-Q-2

Rev. 2 Area of inspection 14-2. Reports attached.

ULTRASONICALLY INSPECTED AND ACCEPTED PER LADISH PROC. 9-Q-2

Rev. 2. Reports attached.

LIQUID PENETRANT INSPECTED AND ACCEPTED PER LADISH PROC.

WELDING RADIOGRAPHICALLY INSPECTED AND ACCEPTED PER

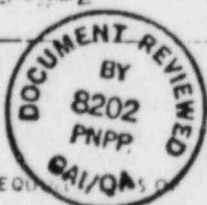
1974 ASME CODE

FITTINGS ARE CAPABLE OF CONFORMING TO HYDROSTATIC TEST REQUIREMENTS

SECTION II

PULLMAN POWER PRODUCTS
QUALITY ASSURANCE DEPARTMENT

By Jm DATE 7/6/77



Page 1

ITEM	TENSILE SPECIMEN
606	STD. RD.
	FULL SEC.
5	STRIP
ITEM	HEAT TREATMENT
5	NOT REQUIRED
	STRESS RELIEVE
606	NORM 1650 °F
	NORM 1750 °F
	TEMPER 1300 °F
	WATER QUENCH 1650 °F
	TEMPER
	WATER QUENCH 1650 °F
	TEMPER 1200 °F

NOTES

I hereby certify that to the best of my knowledge and belief this material analysis report is true and correct.

Issued and subscribed 25th June

at before me this day

19

77 Lawrence Zayac

My commission expires

August 17, 1980

b(2)-4

CRANE

MIDWEST FITTINGS

CERTIFIED MATERIAL TEST REPORT

450 SO. SECOND STREET (R.O. BOX 433) Customer FULLMAN POWER PRODUCTS Customer's Order No. 8405-108
 T. LOUIS, MO. 63104. (63188) TELEPHONE (314) 621-8300 CMF Order No. 13468307 Date 6-23-77 Page 1 of 1

Product Specifications		Quantity	Description Of Item													
ASME SA234 ASME Section III Class 1 1974 Ed. Winter 75 Add. 1 MW IV-20, IV-33 and VIII-1		6	12" SCH 80 (SA234 WPB) LR 90 Deg. F11. (C-431A) X1, X2, X3, X4, X5, X6 (Item 1-248)													
			<div>PULLMAN KILLING QUALITY ASSURANCE CENTER APPROVED 7/3/27 BY 124 11/1/7</div>													
Materials Conform to Specifications	Heat Number or Symbol	Tensile Strength PSI	Yield Strength PSI	Elong. in 2"	Red of Area %	CHEMICAL ANALYSIS										
						C	Mn	P	S	Si	Cr	Ni	Mo	Cu		
SA106 Grade B	(M37561) (CWAL 9)	72,900	38,100	42.0		.21	.88	.009	.014	.190						

PULL-OUT KILLING
 ORDER NO. 8405-108
 CMF APPROVED
 7/15/77 BY [Signature]
 11-1-77

Ultrasonic Test - Pipe was ultrasonic tested per Crane procedure UF-3 Rev. 2 (MWK) and found acceptable.
 Heat Treatment - Not required final forming operation completed at a temperature above 1150 Deg. F. & below 1800 Deg. F. (SA234 Para. 6.1.1.)
 Magnetic Particle - 100% of the fitting was magnetic particle tested per Crane procedure MF-3 Rev. 3 and found acceptable.
 Ultrasonic Test - Fitting was ultrasonic tested per Crane procedure UF-3 Rev. 2 (MWK) and found acceptable.
 Impact Test - Charpy "V" Notch, Full Size at plus 30 Deg. F. - Longitudinal

Fl. lbs.	Shear	Lat. Exp.
110	90%	78 Mils.
110	90%	81 Mils.
122	90%	

THE 78 MILS. AL. CERTIFIED TO
 12/15 ASME CODE.
 2/75 ASME SECTION III
 CRANE



BRINELL HARDNESS

This is to certify that the brinell hardness of fittings described above does not exceed HB197.

REVIEWED AND
 APPROVED BY

G.W. Eckert

8405-108

622-5

CMF affirms that the contents of this report are correct and accurate.
 All test results, examinations and operations performed by CMF comply

CERTIFICATE OF INSPECTION AND ANALYSIS

1224N 1032

DATE: 4-25-77 DATE SHIPPED: 4-22-77 MILL ORDER NO. T-3072-A2-10-20 SHIPPING LIST NO. 115C

CUSTOMER ORDER NO. 9716

CAR NO. PC 525801

MATERIAL: SEAMLESS ☒ PIPE ☐ TUBE, HOT FINISHED

SPECIFICATION: ASME SA-106-B (O.H.)

Standard Pipe & Supply Co., Inc.

Pullman Kellogg Co.

NO. PCS.	CO.	WALL	LENGTH	TOTAL WT.	TOTAL NO.
		12.750" x .844"			57529

CEI
PNPP
1 OR 2
P-1314L

INFORMATION ONLY

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo
57529	.25	.74	.011	.022					

DOCUMENT REVIEWED
BY: 8202
PNPP
GA/QA

THIS MATERIAL CERTIFIED TO
1974 ASME CODE.
W/25 ADDENDA.
SECTION II
PULLMAN KELLOGG
QUALITY ASSURANCE DEPARTMENT
By: [Signature] DATE: 5/16/77

HEAT NO.	TENSILE (KSI)	YIELD (KSI)	% ELONG. IN 2"	% RA	ROCKWELL	HARDNESS BRINELL	GRAIN SIZE
57529	75.0	41.5	29.00 (.505" Test Specimen)				

PULLMAN KELLOGG
QUALITY ASSURANCE
CMTR APPROVED
5/6/77 BY [Signature]
7/5/77 BY [Signature]

THE M. W. KELLOGG CO.
RECEIVED
MAY 6 1977
QUALITY CONTROL

JOINTY DISTANCE = 16TH			ROCKWELL C			FLATTENING			HYDROSTATIC PSI			
						OK			2800			
1	2	4	6	8	10	12	14	16	20	24	28	32

PHOENIX STEEL CORPORATION HEREBY CERTIFIES THAT THE ABOVE MATERIALS HAVE BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE APPLICABLE SPECIFICATIONS AND THE RESULTS OF SUCH INSPECTION AND TESTS AS CONTAINED IN THE COMPANY RECORDS ARE AS SHOWN ABOVE. FOR PROPERTIES OR CHARACTERISTICS FOR WHICH NO METHODS OF INSPECTION OR TESTING ARE PRESCRIBED, SAID SPECIFICATIONS, THE STANDARD MILL INSPECTION AND TESTING PRACTICES OF THE PHOENIX STEEL CORPORATION HAVE BEEN APPLIED. BASED UPON SUCH INSPECTION AND TESTS, THE ABOVE MATERIALS HAVE BEEN APPROVED AS FULFILLING THE REQUIREMENTS OF SAID SPECIFICATIONS.

A. W. Pickens

APPROVED FOR
PRODUCTION

PENE. N^o Unit # 1 P 121, P 414
Unit # 2 P 410, P 112

Code use 1948, Subarticle 98-234) and on 1949 at Summer 1976 Address, and Appendix 1, Volume 1 (1976) and 1 (3, 3 of Summer 1977 Address apply as per Article 98-225 and Paragraph 98-1141).

70195Y-D33.1

TUBE TURNS

RELLOWS EXPANSION JOINT

PLANT - C.E.I.

PLANT CODE 7019554
ITEM NO. 7019554

[illegible][illegible]

Type: Q

701934-100

A new era d'art' ora

DATE	TIME	CLASS	NAME	Q.C. APPROVAL
10/10/10	10:00	101	101	101

VIEWED
BY
5465
GAI'DA
JOCU

REVIEWED
BY 5465
GAL. Q. 1
DOCUMENT

$$b(3,4)$$

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 - B) Bolting Materials Test Reports - pages E42 thru E55, E-109, E-110

C) Control Number

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HMF 4 94487

94487

ev, 1 2
GILLIARD/COMMUNISM
9128
G.C.C.

I HEREBY CERTIFY THIS REPORT TO BE TRUE AND CORRECT
ACCORDING TO RECORDS IN THE POSSESSION OF THIS CORPORATION

By R. Avera, Quality Control Engr.

My Commission Expires: 12/31/2004


$$b(3) - 1$$

ENTIO

DISSEMINATION OF THE 1995-1996 FISHING REGULATIONS

TIME TURNING
ORDER NO. **NMF 4 93173**

CUSTOMER'S
ORDER NO. 93178

59102
9128
8/10-94

I HEREBY CERTIFY THIS REPORT TO BE TRUE AND CORRECT
ACCORDING TO RECORDS IN THE POSSESSION OF THIS CORPORATION

R. C. Campbell, O. C. Farr.

DOCUMENT REVIEWED
BY
6447
SAL/PA

$$b(4) = -1$$

L O J. HOK 34100
D Andrews, Kentucky 48232

3 H T Tube Turns
I O 718 South 28th St., Gate #1
P Louisville, Kentucky 40211

Replaces DAR dated 10/7/77

DIVISION OF CHEMICAL ANALYSIS

ORDER NO. 92182
CUSTOMER'S ORDER NO. 92182

Louisville, Kentucky

40711

DESCRIPTION

Item 001 2 Pieces

32.250 Max

32.125 Min. I.D. x 2.000

+031
-062 x 40.000 + .125 O.D.

Anchor Plates Machine com-
plete per Tube Turns Dag.

7019SY-D49.1 Rev. 1

Cherry "V" Notch @ 0 F.

78-104-85 Ft. lbs. 161-71-68 Mills L.E. 70-100-80% Shear

PHYSICALS

OF MATERIALS FROM WHICH MADE

30
MEAT
THAT
MEAT

30
MEAT
THAT
MEAT

30
MEAT
THAT
MEAT

30
MEAT
THAT
MEAT

30
MEAT
THAT
MEAT

3 51,700 78,400 29.0

TAG: 1 Pc. P.O. 70195

1 Pc. P.O. 70195

Cherry "V" Notch @ 0 F.

CHEMICAL ANALYSIS

C MN P S SI CR NI MO CB

.22 1.01 .010 .017 .22

Item 49 Code N

Item 53 Code N

MAY
OR
LOT
NO.

59102

SA516 Or .70

☒ THIS MATERIAL ACCEPTED AS COMPLYING WITH
THE SPECIFICATION

☒ COMPLIANCE V... SPEC IS BASED ON
[] CAC ☒ AUTH OF 1-25-77

☐ REF NO 16 200 167 70195

TURN TURNS

BY 60 V... DATE 10-1-78

THIS MATERIAL ACCEPTED AS COMPLYING WITH THE SPECIFICATION

EXEMPTION Y ... IS BASED ON

[] C/C AT AUNT OF 1-25-77

REMARKS: NO 2ND REPAIRS

TUBE TURNS

BY 60/10/77 DATE 10-1-77



STANDARD ROUND TEST SPECIMEN #1 NORMALIZED 2-ANNEALED 3-HEAT TREATED PER ORDER SPECIFICATION.
23rd DAY OF November 19 77

I HEREBY CERTIFY THIS REPORT TO BE TRUE AND CORRECT
ACCORDING TO RECORDS IN THE POSSESSION OF THIS CORPORATION

NOTARY PUBLIC

VICKI L. ...
Notary Public in and for Harris County, Texas
My Commission Expires November 8, 1978

R. C. Campbell, Q. C. Not.



677/593

FORM NP-1 MANUFACTURERS' DATA REPORT FOR NUCLEAR PUMPS OR VALVES*

As Required by the Provisions of the ASME Code Rules

1. Manufactured by Atwood & Morrill Co. Inc., Salem, Mass. 01970 Order No. 13560-01
(Name & Address of Manufacturer)

2. Manufactured for General Electric Co., San Jose, California Order No. 205-AF774
(Name and Address)

3. Owner Cleveland Electric Illuminating Co.

4. Location of Plant North Perry, Ohio

5. Pump or Valve Identification Valve S/N 5-560 26" 575# Main Steam Isolation Valve

For Service in Main Steam Piping System

(Brief description of service for which equipment was designed)

(a) Drawing No. 13560-01-H Rev. 3 Prepared by Robert J. Knox

(b) National Board No. N/A

6. Design Conditions 1375 psi 586 °F
(Pressure) (Temperature)

7. The material, design, construction, and workmanship complies with ASME Code Section III, Class 1

Edition 1974, Addenda Date N/A, Case No. 1622

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
Body	SA216 WCB	Quaker Alloy	S/N 5-560
RT# N2128			
(b) Forgings			
Poppet	SA350 Gr. LF-2	Cann & Saul	S/N 1-560
Cover	SA105 (QT)	Cann. & Saul	S/N 1-560

FORM NPV-1 (back)

Mark No.	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
Cover Studs (18)	SA540 Gr. B23 Class 5	Jos. Dyson & Sons	Heat# 114188
Cover Nuts (18)	SA540 Gr. B23 Class 5	Jos. Dyson & Sons	Heat# 134951
(d) Other Parts			
* 3/4" - Nipples (2)	SA106 Gr. B	U.S. Steel	S/N 1-560
* 45° Elbow	SA105	Vogt Mach. Co.	S/N 9-560
* Note: These items comply with the CODE for Material Construction and workmanship, but are not included as far as design is concerned.			

8. Hydrostatic test Body 2175 Poppet 1450 psi.

CERTIFICATION OF DESIGN

Design information on file at General Electric Co., San Jose, California
 Stress analysis report on file at Atwood & Morrill Co., Inc., Salem, Mass.
 Design specifications certified by Ranjit Ranjan Ghosh (1) Prof. Eng. State Calif. Reg. No. 16371
 Stress analysis report certified by Herbert Cook (1) Prof. Eng. State Mass. Reg. No. 10981
 (1) Signature not required. List name only.

We certify that the statements made in this report are correct.

Date 2-23 19 76 Signed Atwood & Morrill Co. Inc. By [Signature]
 (Manufacturer) Quality Control Manager
 Certificate of Authorization No. N812 expires May 7, 1977

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of Province of Massachusetts and employed by Hartford Steam Boiler Insp. & Ins. Co. of Hartford, Conn. have inspected the equipment described in this Data Report on 2-23 19 76, and state that to the best of my knowledge and belief, the Manufacturer has constructed this equipment in accordance with the applicable Subsections of ASME Code, Section III.
 By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the equipment described in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 2-23 19 76

[Signature]
 (Inspector) V.J. Smith

Commissions Mass. 946
 (National Board, State, Province and No.)

Cust.: General Electric Company

Cust. P.O.# : 205-AF774

A&M S.O., No. : 13560 Item No. 01 Dwg. No. : 13560-01-H Rev. 3

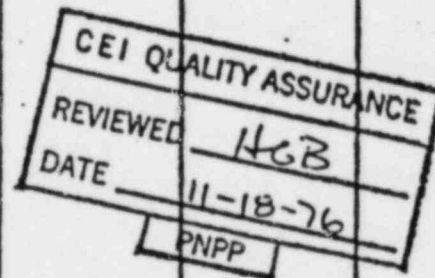
Valve Serial No. : 5-560 ASME Section III Class : 1 (1974)

Valve Description : 26" Main Steam Isolation Valve

Addenda : N/A

Plant Name : Perry I. Location : North Perry, Ohio

Record Title	A&M Ident. No.	RT. No.	Heat No.	Date Rec'd.	In Pkg
GENERAL					
G.E. Product Quality Certification					x
Manufacturers Data Report (NPV-1)					x
Vendors Cert. for Qualified NDE & Weld Personnel					x
A&M Cert. for Qualified NDE & Weld Personnel					x
Customer Certified Design Spec.					No
A&M Certified Stress Report					No
Certified "As Constructed" Dwg.					No
Approved DDR's	N/A				No
BODY					
CMTR with Heat Treat Charpy Data	5-560	N2128	F6944		x
R.T. Reader Sheets w/shooting sketch					x
M.T. as cast at foundry					x
Repair Data (Charts, P.W.H.T. etc.)					x
M.T. Finished Mach. Surfaces & Cert.					x
P.T. Seat Overlay w/Weld Record & Cert.					x
P.T. Riba Overlay w/Weld Record & Cert.					x
P.T. Weld Ends after Final Mach.					x
Min. Wall Dimensional Report					x
Weld Rod CMTR					x
Visual Examination (See Final Insp. Data Sheet)					x
POPPET					
	1-560	N/A	632225		
CMTR with Heat Treat & Charpy Data					x
Ultrasonic Test Report					x
M.T. Final Mach. Surfaces & Cert.					x
P.T. Overlays w/Weld Record & Cert.					x
Min. Wall Dimensional Report					x
Weld Rod CMTR					x



Retained A&M Eng. Files
 Retained A&M Eng. Files
 Retained A&M Q.C. Files

signed 6/1/76

Reviewed By: J. F. Boehm Date: 6-3-76
 N. W. G. H. Quality Control Specialist
 General Electric Co. - BWR Projects Dept.

Record Title	Ident. #	RL No.	Heat No.	Date	REC'D
<u>COVER</u> CMTR with Heat Treat & Charpy Data Ultrasonic Test Report M.T. Final Mach. Surfaces & Cert. P.T. Backseat Overlay w/Weld Record & Cert. P.T. 3/4" Nipple to Cover Weld w/Weld Record Min. Wall Dimensional Report Weld Rod CMTR	1-560	N/A	632202		
<u>STEM (NPR)</u> CMTR with Heat Treat & Charpy Data Ultrasonic Test Report P.T. Final Mach. prior & post threading Min. Wall Dimensional Report	2-560	N/A	71780		
<u>STUDS & NUTS</u> CMTR with Heat Treat & Charpy Data M.T. all surfaces (Subvendor)	N/A	N/A	114188 (Studs) 134951 (Nuts)		
<u>3/4" PIPE</u> Mfgs. Certificate of Compliance P.T. All Accessible Surfaces & Cert. <u>45° ELBOW</u>	1-560		64L349		
Mfgs. Certificate of Compliance P.T. of elbow to pipe weld w/weld record Weld Rod CMTR P.T. All Accessible Surfaces & Cert.	9-560	N/A	N/A		
<u>FINAL REPORTS</u> Hydro & Operational Test Report Final Dimensional Record Final Inspection Data Sheet					
<u>OPERATOR</u> Subvendor Test Report	668268	N/A	N/A		

A&M 7/23/76 Auth. Insp. 7/23-76 Cust. Rep. 2-24-76

d(1)-4



QUAKER ALLOY CASTING CO.
A DIVISION OF HARSCO CORP.
MYERSTOWN, PENNA. 17067

S/N 5-560

1356.0
BODY 26"

MATERIAL TEST REPORT

205AF774

CUSTOMER ORDER NO	PATTERN NO	QUAKER ALLOY DESIGNATION	SPECIFICATION	SHOP ORDER NUMBER
AM25336	16731-30147-102	Q70	ASME SA216 GR.WCB (74)	

DATE SHIPPED

1-16-76

CUSTOMER

Atwood and Morrill

APPROVED
BY *R. J. H. Morrill*
DATE *1/23/76*
ATWOOD & MORRILL CO. INC.

HEAT NO	C	Mn	Si	P	S	Cr	Ni	Mo			YIELD P.S.I.	TENSILE P.S.I.	ELONG. %	RED. of AREA %	CSTG. SER.#
F6944	.25	.68	.47	.013	.018						46,000	84,000	32.0	50.7	F6944-3
											34-37-37				
											34-36-37				
											30-30-30				

REMARKS

Reviewed By: REC Date: 1/23/76
R. E. Ciampa, Quality Control Representative
General Electric Co. - BWR Projects Dept.

CHEMICAL & PHYSICAL
REPORT CHECKED

BY: *W. Franco*
DATE: 1-21-76
ATWOOD & MORRILL CO. INC.



1-14-76



R. 1-15-76

STATE OF PENNSYLVANIA, COUNTY OF LEBANON, S.S.
SWORN TO AND SUBSCRIBED BEFORE ME

"I CERTIFY THE ABOVE INFORMATION IS CORRECT"

QUAKER ALLOY CASTING CO.

THIS

DAY OF

19

1-23-76

CANN & SAUL STEEL CO.

Spd 1-560
Thru 6-5

Report of Physical Tests and/or Chemical Compositions

Date 11-14-75

REVISED COPIES (11-19-75)

Customer's Order No.

Cann & Saul Order No.

Customer Atwood & Morrill Co.
Address 285 Canal St.
Salem, Mass. 01970

AM-25353
Ref. # 13560-01-002
G.E. 205-AF-774

34060

Attention Purchasing Dept.

RECEIVED
11-19-75

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CB
632225	.24	1.20	.024	.030	.25				

Lab. No.

PHYSICAL TESTS

CUT FROM	TEST NUMBER	GAUGE	YIELD PT. LBS.	YIELD PER Square In Lbs.	BROKE AT LBS.	ULTIMATE TENSILE LBS.	ELONG %	REDUCED AREA	Reduction %
FORGEDEX Forging	34060 1	.505	YS 10,100	YS 50,500	16,000	80,000	34.0	.062	69.0
Charpy Impacts "V" Notch			56 54 55	73 73 72	25 30 25	Mils Lateral expansion @ +60°F Ft. Lbs. percent shear			

CHEMICAL & PHYSICAL
REPORT CHECKED

Heat Treat to C&S Proc.

OTHER TESTS

#66 (11-14-75)

NY W. F. F. F.
DATE 11-24-75
ATWOOD & MORRILL CO. II

Sonic C&S Proc. A386, Rev. 20(4/11/75) Acceptable
M.T. C&S Proc. E&PV #12, Rev. 1(5/7/75) Acceptable

We certify that the contents of this report are correct and accurate and that all operations performed by our ~~company~~ company or subcontractors are in compliance with the requirements of the materials specification and the ASME Code, Sec. III 1974 Edition.

Customer's Specifications: ASME SA-350 Gr. LF-2(.30 C. Max.) YX 36,000 YS .27
Charpy "V" Impact 25 Mils Min. Lat. Exp. (+60 F) T. 70,000
R. 22%
R. 30%

B.H.N.

THE ABOVE TESTS COVER THE FOLLOWING MATERIAL:

6 - Poppet Forgings per Dwg. 30521-807-D, Rev. 1 for Code 30521-807-2974
Forgings serialized #1 thru 6

Reviewed By: C. E. Ciampa Date: 11-22-75
R. E. Ciampa, Quality Control Representative
General Electric Co. - Power Products Dept.
CANN & SAUL STEEL CO.

G.E. & A&M

APPROVED

DATE 11-14-75

C. Bowers
d(11)-6

CANN & SAUL STEEL CO.

ROYERSFORD, PA. 19468

Report of Physical Tests and/or Chemical Compositions

12/3/75

Corrected copy for report dated 11/26/75

Customer's Order No.

Cann & Saul Order No.

Customer

Atwood & Morrill Co.

AM-25353

Address

2 85 Canal St.

Ref. #13560-01

34062
COVER

Salem, Mass. 01970

C.A. 206-17-774

Attention

Purchasing Dept.

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CB
632202	.26	.94	.023	.015	.20				

Lab. No.

PHYSICAL TESTS

CUT FROM	TEST NUMBER	GAUGE	YIELD PT. LBS.	YIELD PER Square in Lbs.	BROKE AT LBS.	ULTIMATE TENSILE LBS.	ELONG %	REDUCED AREA	Reduction %	B.H.N.
Forg- ing	34062 1	.505	9,600	48,000	16,000	80,000	32.0	.061	69.5	
Charpy Impacts "V" Notch		67	68	61	Mils Lateral expansion @ +60°F					
		89	92	82	Ft. Lbs.					
		30	30	25	percent shear					
CHEMICAL & PHYSICAL REPORT CHECKED										

OTHER TESTS

BY

Brinell: 143/149

Sonic C&S A388, Rev. 20(4/11/75) Acceptable

Mag. Part. B&PV #12, Rev. 1(5/7/75) Acceptable for A&M Info

Heat Treat. to C&S Proc. #5B(10/25/74)

We certify that the contents of this report are correct and accurate and that all operations performed by our company or subcontractors are in compliance with the requirements of materials specification and the ASME Code Sec. III

Customer's Specifications:

ASME SA-105 (QT)

XX 36,000 YS .2% 1974 Ed.

Charpy "V" Impacts 25 Mils lat. exp. @ +60°F

Y 70,000

E 22%

R 30%

B.H.N. 187 Max.

THE ABOVE TESTS COVER THE FOLLOWING MATERIAL:

- 4 - Cover Forgings per Dwg. 30861-405-D, Rev. 0 for Code 30861-405-2974
Forgings serialized #2 thru 5

G.E.

Reviewed By: R. E. Ciampa
R. E. Ciampa, Quality Control Representative
General Electric Co. - BWR Projects Dept.
Inspector

APPROVED

DATE

11/27/75

BY: [Signature]

CO. INSP.

CANN & SAUL STEEL CO.

[Signature]
Sgt. of Tests

d(1)-7

JOSEPH DYSON AND SONS, INC. CERTIFIED TEST REPORT

January 12, 1976
P.O. AM-25931
S.O. N-572
Brisch Code 34285-290
327
Heat No. 114188 Code A

Atwood and Morrill Co.
285 Canal Street
Salem, Massachusetts 01970

STUDS

1-13-76

123 Pcs.

Studs for 26" and 28" Main Steam Isolation Valves
2-1/4" - 8 UN3A x 13-1/4" Long S.E. 3-1/2" N.E.
3-1/2" per Sketch 3730

SPECIFICATIONS: Alloy Steel Bolting Material for Special Application
ASME SA-540 Gr. B-23, Class 5

HEAT NUMBER 114188
CODE A-88

LADLE ANALYSIS: C-.42 Mn-.81 Phos-.009 Sul-.008 Sil-.34 Cr-.81 Ni-1.75 Mo-.28

CHECK ANALYSIS: C-.42 Mn-.81 Phos-.014 Sul-.006 Sil-.27 Cr-.82 Ni-1.74 Mo-.26

MECHANICAL TESTS:	TENSILE	YIELD	ELONG	RED	RC
	146,300	130,450	18	55	30.5
	141,350	122,400	17	54.5	31.5

CHARPY V-NOTCH Impact Test per SA-370 Specification At +60°F
45 Ft/Lbs.

	FT/LBS.	% SHEAR	LATERAL EXPANSION (IN.)	
	69	50	.048	
	68	50	.048	
	68	50	.048	
Ave.	68			CHEMICAL & PHYSICAL REPORT CHECKED
	74	60	.052	BY <u>ST. Sharp</u>
	75	60	.053	DATE <u>1/16/76</u>
	74	60	.053	ATWOOD & MORRILL CO. INC.
Ave.	74			

HEAT TREAT DATA: Heated to 1550°F 2-1/2 Hrs. at Heat - Oil Quenched
Tempered 1180°F 3 Hr. at Heat - Air Cooled
Per Procedure HTN-572 Rev. 2, dated 6-12-75

-CONTINUED-

REC Date: 1/20/76
R. E. Clump, Quality Control Representative
General Electric Co. - DWR Projects Dept.

AI 1-16-76
for 123 studs

APPROVED
BY R. E. Clump
DATE 1/16/76
ATWOOD & MORRILL CO. INC.

STUDS

Atwood and Morrill Co.
285 Canal Street
Salem, Massachusetts 01970

January 12, 1976
P.O. AM-25931
S.O. N-572
Brisch Code 34Z
327
Heat No. 114188

ULTRASONIC INSPECTION:

All items referenced in this report have been inspected in accordance with Atwood and Morrill approved Procedure UL-4, Supplement Rev. 1, dated 6-12-75 and per ASME Code 1974, Sec. III, Para 2584/2585.

RESULTS OF INSPECTION:

All items acceptable.

MAGNETIC PARTICLE INSPECTION:

All items referenced in this report have been inspected in accordance with Atwood and Morrill approved Procedures UL-6, Supplement Rev. 1, dated 6-12-75.

RESULTS OF INSPECTION

All items acceptable.

We hereby certify that the contents of this report are correct and accurate and that all operations performed by this company or our sub-contractors are in compliance with the material specification and appropriate material requirements of the ASME Code Sec. II 1974, as stipulated in the procurement documents.

JOS. DYSON & SONS, INC.

Ralph McKinney
Art Mazzairella-Q.A. Manager or/
Ralph McKinney

Reviewed By: REC Date: 1/20/76
R. E. Ciampa, Quality Control Representative
General Electric Co. - BWR Projects Dept.

January 12, 1976

CORRECTED TEST REPORTS 1-16-76

S.O. N-573

Atwood and Morrill Co.

285 Canal Street

Salem, Massachusetts 01970

P.O. AM-25931

Heat No. 134951

Code A-13

Brisch Code 21838-789

ITEM 2

197 Pcs.
1-13-76Hex Nuts for 26" and 28" Main Steam Isolation Valves
2-1/4" - 8 ANSI Standard Heavy

SPECIFICATIONS: SA-540 B-23, Class 5

HEAT NO. 134951 CODE A-13

LADLE ANALYSIS: C-.42 Mn-.75 Phos-.013 Sul-.011 Sil-.25 Ni-1.70 Cr-.77 Mo-.26

CHECK ANALYSIS: C-.43 Mn-.67 Phos-.016 Sul-.012 Sil-.24 Ni-1.56 Cr-.79 Mo-.27

MECHANICAL TESTS:

	<u>TENSILE</u>	<u>YIELD</u>	<u>ELONG</u>	<u>RED</u>	<u>RC HARDNESS</u>
	142,150	122,300	17	57.5	31.8
	146,750	130,350	15	42	32.8
CHARPY IMPACT TESTED AT +60°F PER SA-370 45 Ft/Lbs.					
	<u>FT/LBS.</u>	<u>% SHEAR</u>	<u>LAT. EXPANSION (IN.)</u>		
	74	60	.051		
	66	50	.047		
	<u>73</u>	60	.051		
Ave.	71				
	54	40	.037		
	45	30	.030		
	<u>46</u>	30	.031		
Ave.	48				

Meets Mechanical requirements of ASME SA-540 Gr. B-23, Class 5, and
ASME Section III, Sub-Section NB-2333HEAT TREAT DATA: Heated to 1550°F 2 Hrs. at Heat - Oil Quenched
Tempered 1160°F 2-1/2 Hrs. at Heat - Air Cooled
PER PROCEDURE HTN-573, Rev. 2, dated 6-12-75Reviewed By: REC Date: 1/20/76
R. E. Cisma, Quality Control Representative
General Electric Co. - EWR Projects Dept.

-CONTINUED-

D - 1-20-76A.I. for 197 pieces
for 13560-01102.

d(1)-10

JOS. DYSON AND SONS, INC. CERTIFIED TEST REPORT

Atwood and Morrill Co.
285 Canal Street
Salem, Massachusetts 01970

CORRECTED TEST REPORTS 1-16-76

January 12, 1976
P.O. AM-25931
S.O. N-573
Heat No. 134951
CODE A-13
Brisch Code 21838-78

ULTRASONIC INSPECTION:

All items referenced in this report have been inspected in accordance with Atwood and Morrill approved Procedure UL-4, Supplement 42, Rev. 1, dated 6-12-75, and ASME Code 1974, Section III, Para. NB-2584/2585

RESULTS OF INSPECTION:

All items acceptable.

MAGNETIC PARTICLE INSPECTION:

All items referenced in this report have been inspected in accordance with Atwood and Morrill approved Procedures UL-6, Supplement 19, Rev. 1, dated 6-12-75, and ASME Code 1974, Sec. III, Para. NB-2580

RESULTS OF INSPECTION:

All items acceptable.

Material referenced in this report has been tested and inspected per the requirements of the specifications and as stated herein and are acceptable.

We hereby certify that the contents of this report are correct and accurate and that all operations performed by this company or our sub-contractors are in compliance with the material specification and appropriate material requirements of ASME Code Sec. III, 1974 as stipulated in the procurement documents.

JOS. DYSON & SONS, INC.

Ralph McKinney
Art Mazzaella
Quality Assurance Manager/
Ralph McKinney

Reviewed By: GEC Date: 1/20/76
R. E. Cinnip, Quality Control Representative
General Electric Co. - DWR Projects Dept.

1717/2101

FORM NPV-1 N CERTIFICATE HOLDERS' DATA REPORT FOR NUCLEAR PUMPS OR VALVES*
As Required by the Provisions of the ASME Code, Section III, Div. 1

1. Manufactured by Nuclear Valve Div., Borg Warner, 7500 Tyrone Ave., Van Nuys, Calif.
(Name and Address of N Certificate Holder)
2. Manufactured for Cleveland Electric Illuminating Co., P.O. Box 5000, Cleveland, Ohio
(Name and Address of Purchaser or Owner)
3. Location of Installation Perry Nuclear Power Plant, North Perry, Ohio
(Name and Address)
4. Pump or Valve Gate Valve Nominal Inlet Size 20 (inch) Outlet Size 20 (inch)

	(a) Model No., Series No. or Type	(b) N Certificate Holder's Serial No.	(c) Canadian Registration No.	(d) Drawing No.	(e) Class	(f) Nat'l. Std. No.	(g) Year Built
(1)	900#	(51691)	N/A	81160-1	2	N/A	1979
(2)							
(3)							
(4)							
(5)							
(6)							
(7)							
(8)							
(9)							
(10)							

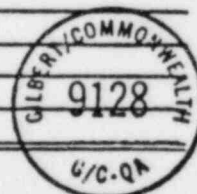
5. The valves are designed to handle a fluid media which includes steam, water condensate, borated water, etc., associated with a PWR and BWR. The temperature pressure rating of the media is stated below.
(Brief description of service for which equipment was designed)

6. Design Conditions 2160 (Pressure) psi 100 (Temperature) °F or Valve Pressure Class N/A (1)
7. Cold Working Pressure 2160 psi at 100°F.
8. Pressure Retaining Pieces

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
Body-Code 3V02			
	SA 216 WCB	Pacific Metals	
Bonnet-Code 3V12			
	SA 216 WCB	Pacific Metals	
Gate-Code 3V14			
	SA 216 WCB	Pacific Metals	
(b) Forgings			
Retainer-Code 3L50			
	SA 105	Compton Forge	

(1) For manually operated valves only.

* Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8-1/2" x 11", (2) information in items 1, 2 and 5 on this Data Report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded at top of this form.



d(2)-1

Mark No.	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
N/A			
(d) Other Parts			
Drain Pipe-Code 3T42	SA 106 GR B	Tubesaless	
Pipe Plug-Code 1A85	SA 105 Gr. II	Compton Forge	

8. Hydrostatic test 3250 psi. Disk Differential test pressure 2160 psi.

CERTIFICATE OF COMPLIANCE

We certify that the statements made in this report are correct and that this pump, or valve, conforms to the rules of construction of the ASME Code for Nuclear Power Plant Components, Section III, Div. 1, Edition 1974.
 Addenda Winter 1975 (Date), Code Case No. N/A, Date 10-8-77.
 Signed Nuclear Valve Div., Borg Warner by Steve Compton
 (N Certificate Holder)
 Our ASME Certificate of Authorization No. N-1254 to use the N (N) symbol expires 10/27/81 (Date)

CERTIFICATION OF DESIGN

Design information on file at NYD of Borg Warner, 7500 Tyrone Ave., Van Nuys, Ca. 91409
 Stress analysis report (Class 1 only) on file at N/A
 Design specifications certified by (1) Jeffrey Lee Fink
 PE State PA Reg. No. 25626
 Stress analysis certified by (1) N/A
 PE State _____ Reg. No. _____
 (1) Signature not required. List name only.

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of California and employed by Lumbermen's Mutual Casualty of Long Grove, Illinois have inspected the pump, or valve, described in this Data Report on 10/9 19 79, and state that to the best of my knowledge and belief, the N Certificate Holder has constructed this pump, or valve, in accordance with the ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the equipment described in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 10/9 19 79
[Signature]
 (Inspector)

Commissions 1275-CA OHIO 1/25/78
 (Nat'l Bd., State, Prov. and No.)



PACIFIC METALS CO., LTD.

Nuclear Valve Division
MESSRS BORG - WARNER CORPORATION

HEAD OFFICE NO.1, 8-1 Chome Otomachi Chiyoda-ku Tokyo Japan.
NAOETSU WORKS Minato-cho Joetsu Niigata Pref. Japan.

HEAT NO. 85134
N CODE NO. 3V02
S/O
P.O. 1412
QTY. 1
INSP (8V 122) DATE 3-15-79
VENDOR GEO CHIALG

Gate Valve Body
NAME OF ARTICLES Gate Valve Bonnet

DRAWING No.

SPECIFICATION ASME SA216 Gr. WCB

INSPECTION CERTIFICATE

Date Dec. 8, 1978

Inspection No. 78 - 196

Order No.

Heat Charge No.	Quantity		Tensile Test				Hardness Test	Bond Test	Impact Test	Chemical Compositions in %									Residuals V
			Yield Strength	Tensile Strength	Elongation	Reduction	HB		Charpy	C	Si	Mn	P	S	W	Cr	Mo	Cu	
	Number	Weight in lbs	kg/mm² Psi	kg/mm² Psi	%	%		kgm/cm² (Notch)	max.	max.	max.	max.	max.	max.	max.	max.	max.		
Standard			min. 36,000	70,000 90,000	min. 22	min. 35				max. 0.30	max. 0.60	max. 1.00	max. 0.040	max. 0.045	max. 0.50	max. 0.50	max. 0.25	max. 0.50	max. 0.03
85134	1		44,950	72,560	30.8	57.0	140			0.25	0.50	0.78	0.012	0.011	0.08	0.11	0.01	0.16	tr.
85135	1		47,790	81,070	24.8	39.8	152			0.24	0.48	0.72	0.009	0.017	0.11	0.17	0.02	0.16	tr.
85132	6		46,510	79,080	26.8	46.3	152			0.24	0.54	0.76	0.011	0.016	0.08	0.14	0.04	0.14	tr.

HEAT No.	PART No.	ARTICLE	FURNACE LOAD	Impact Test	85134-1	85134-2	85134-3
85134	79558	20"x900lb Gate V. Body	018 - 172	Test Temperature(°F)	39.2	39.2	39.2
85135	79558	20"x900lb Gate V. Body	018 - 160	Lateral Expansion(mil)	31.50	30.31	30.31
85132	79565	20"x900lb Gate V. Bonnet	018 - 168	Absorbed Energy(ft-lb)	35.94	29.49	28.84

Impact Test	85135-1	85135-2	85135-3	85132-1	85132-2	85132-3
Test Temperature(°F)	39.2	39.2	39.2	39.2	39.2	39.2
Lateral Expansion(mil)	29.92	34.65	33.07	29.13	29.92	28.35
Absorbed Energy(ft-lb)	29.49	33.19	29.86	23.62	26.88	24.93

PACIFIC METALS CO., LTD. NAOETSU WORKS.

Surveyor

REVIEWED BY
AUTHORIZED
INSPECTOR

DATE



K. Nishiyama
Manager of Quality Assurance

3/14/79

d(2)-3



PACIFIC METALS CO., LTD.

Nuclear Valve Division
SSRS IORG - WARNER CORPORATION

HEAD OFFICE NO1, 8-1 Chome Otomachi Chiyoda-ku Tokyo Japan.
MAETSU WORKS Minato-Che Jooitsu Niigata Pref, Japan.

Gate Valve Body
ME OF ARTICLES Gate Valve Bonnet

AWING No.

ECNICATION ASME SA216 Gr. WCB

INSPECTION CERTIFICATE

HEAT NO. 85135
N CODE NO. 3V12
S/O
P.O. 14103
QTY. 6
INSP DATE 3-16-79
VENDOR GEO CHIANG

Date Dec. 8, 1978

Inspection No. 78 - 196

Order No.

Lot No.	Quantity		Tensile Test				Hardness Test	Bend Test	Impact Test	Chemical Composition in %										Remarks V
			Yield Strength	Tensile Strength	Elongation	Reduction				Charpy	C	Si	Mn	P	S	Fe	Cr	Ni	Cu	
	Number	Weight in lbs	kg/cm ² Psi	kg/cm ² Psi	%	%	kg/cm ² (notch)	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.			
			min. 36,000	70,000 90,000	min. 22	min. 35					0.30	0.60	1.00	0.040	0.045	0.50	0.50	0.25	0.50	0.03
134	1		44,950	72,560	30.8	57.0	140				0.25	0.50	0.78	0.012	0.011	0.08	0.11	0.01	0.16	tr.
135	1		47,790	81,070	24.8	39.8	152				0.24	0.48	0.72	0.009	0.017	0.11	0.17	0.02	0.16	tr.
132	6		46,510	79,000	26.8	46.3	152				0.24	0.54	0.76	0.011	0.016	0.08	0.14	0.04	0.14	tr.

HEAT No.	PART No.	ARTICLE	FURNACE LOAD	Impact Test	85134-1	85134-2	85134-3
85134	79558	20"x900lb Gate V. Body	018 - 172	Test Temperature(°F)	39.2	39.2	39.2
85135	79558	20"x900lb Gate V. Body	018 - 160	Lateral Expansion(mil)	31.50	30.31	30.31
85132	79565	20"x900lb Gate V. Bonnet	018 - 168	Absorbed Energy(ft-lb)	35.94	29.49	28.84

Impact Test	85135-1	85135-2	85135-3	85132-1	85132-2	85132-3
Temperature(°F)	39.2	39.2	39.2	39.2	39.2	39.2
Lateral Expansion(mil)	29.92	34.65	33.07	29.13	29.92	28.35
Absorbed Energy(ft-lb)	29.49	33.19	29.86	23.62	26.88	24.93

PACIFIC METALS CO., LTD. MAETSU WORKS.

Surveyor

REVIEWED BY
AUTHORIZED
INSPECTOR



K. Nishiyama

Manager of Quality Assurance

3/19/79

d(2)-4



PACIFIC METALS CO., LTD.

Nuclear Valve Division
MESSRS. DONG - WARNER CORPORATION

HEAD OFFICE NO. 1, 8-1 Chomei Otomachi Chiyoda-ku Tokyo Japan.
NADETSU WORKS Minato-cho Joetsu Niigata Pref. Japan.

HEAT NO. 85131
N CODE NO. 3V14
S/O
P.O. 14184
QTY. 5
INSP DATE 3-16-78
VENDOR G30 CHIANC

NAME OF ARTICLES Gate Valve Gate

DRAWING No.

SPECIFICATION ASME SA216 Gr. WCB

INSPECTION CERTIFICATE

Date Dec. 8, 1978

Inspection No. 78 - 197

Order No.

Heat Charge No.	Quantity		Tensile Test				Hardness Test	Bond Test	Impact Test	Chemical Composition in %									Rejection V	
			Yield Strength	Tensile Strength	Elongation	Reduction	HB		Charpy	C	Si	Mn	P	S	Ni	Cr	Mo	Cu		
	Number	Weight in lbs	kg/mm ² Psi	kg/mm ² Psi	%	%			kgm/cm ² (notch)											
			min.	70,000	min.	min.				MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.		MAX.
Standard			36,000	90,000	22	35				0.30	0.60	1.00	0.040	0.045	0.50	0.50	0.25	0.25	0.03	
85130	1		49,640	80,220	25.6	46.3	156			0.24	0.51	0.74	0.013	0.013	0.20	0.16	0.03	0.17	tr.	
85131	5		43,670	75,950	31.6	54.4	144			0.26	0.46	0.71	0.005	0.013	0.10	0.21	0.02	0.15	tr.	

HEAT No. 85130 PART No. 79569 ARTICLE 20"x900lb Gate V. Gate FURNACE LOAD 018 - 168
Remarks 85131 79569 20"x900lb Gate V. Gate 018 - 168

REVIEWED BY
AUTHORIZED
INSPECTOR

DATE

Impact Test	85130-1	85130-2	85130-3	85131-1	85131-2	85131-3
Test Temperature(*F)	39.2	39.2	39.2	39.2	39.2	39.2
Lateral Expansion(mil)	42.91	32.28	33.86	33.07	29.53	32.28
Absorbed Energy(ft-lb)	40.14	30.14	32.17	33.55	28.19	27.54

PACIFIC METALS CO., LTD. NADETSU WORKS.

Surveyor



K. Nishiyama
Manager of Quality Assurance

d(2)-5

COMPTON FORGE, INC.

No 7913

REPORT OF CHEMICAL AND PHYSICAL TESTS

SOLD TO: NUCLEAR VALVE DIVISION
P.O. BOX 2185
VAN NUYS, CA 91409

SHIPPED TO:
7500 TYRONE AVE.
VAN NUYS, CA 91409

CUST. ORDER NO. 16805
SHIPPER NO. 7913
SPECIFICATION NO. ASME SA-105 1029 NORMALIZED, CLEANED, & SONIC

ITEM NO. 1
DESCRIPTION 14 PC'S P/N: 26 'OD 18 1/2 ID" HEAT: 217160 W/O: FD-1763
NUCLEAR CODE: 3L50 1 TEST BAR

REVIEWED BY
AUTHORIZED
INSPECTOR

DATE 07-13-78

MAT'L SA-105 SIZE 12" RCS

MILL SHARON

HEAT NO. 217160
N CODE NO. 3L50
S/O
P.O. 16805
QTY. 14
INSP DATE 9-26-78
VENDOR Compton Forge

MECHANICAL PROPERTIES

HEAT NO.	YIELD POINT P.S.I.	TENSILE STRENGTH P.S.I.	% ELONG 2"	% RED. AREA	BRINELL	ROCKWELL
217160	58,400	83,900	27.5	60.6		

N

COMPTON FORGE, INC. CERTIFIES THAT THE ABOVE FORGINGS WERE MANUFACTURED AND PROCESSED
IN ACCORDANCE WITH AND MEET THE REQUIREMENTS OF:
NMS 70478 NUCLEAR VALVE P.O. #16805
REV. D

DANIEL PAUL MCGARY
DANIEL PAUL MCGARY

Date: 09-14-78

CHEMICALS

HEAT NO.	C	MN	P	S	SI	NI	CR	CU	AL	MO	TI		
217160	.31	.81	.013	.018	.23								

SUBSCRIBED AND SWORN TO BEFORE ME THIS 14 DAY OF SEPTEMBER 19 78

I CERTIFY THAT THESE ARE CORRECT
COPIES OF REPORTS NOW ON FILE AT
COMPTON FORGE, INC.

NUCLEAR

BY

d(2)-6

FORM NPV-1 N CERTIFICATE HOLDERS DATA REPORT FOR NUCLEAR PUMPS OR VALVES

As Required by the Provisions of the ASME Code, Section III, Div. 1

MF 19065 11

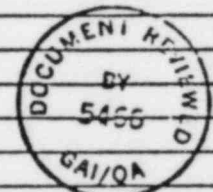
- Manufactured by Rockwell International Corp., 1900 S. Saunders St., Raleigh, NC 27603
(Name and Address of N Certificate Holder)
- Manufactured for Cleveland Elec. Ill. Company, P.O. Box 500, Cleveland, Ohio 44101
(Name and Address of Purchaser or Owner)
- Location of installation Perry Nuclear Power Plant, Units 1 & 2, North Perry, Ohio
(Name and Address)
- Pump or Valve Valve Nominal Inlet Size 20 (inch) Outlet Size 20 (inch)

(a) Model No. Series No. or Type	(b) N Certificate Holder's Serial No.	(c) Canadian Registration No.	(d) Drawing No.	(e) Class	(f) Nat'l. - Bd. No.	(g) Year Built
(1) 7592(WCC)	QC-51	N/A	D81-24401-15	1	670	1982
(2) JNQTY			Rev. A			
(3)						
(4)						
(5)						
(6)						
(7)						
(8)						
(9)						
(10)						

- Controlled Closure Check Valve
Heat No. 4810433-120 (Brief description of service for which equipment was designed) Rockwell S.O. 36-24401

- Design Conditions 1510 (Pressure) psi 420 (Temperature) °F or Valve Pressure Class N/A (1)
- Cold Working Pressure 2250 psi at 100°F.
- Pressure Retaining Pieces

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
4810433	SA 216 Gr. WCC	Rockwell Int'l (Metal Casting Div.)	Body
(b) Forgings			
116447	SA 105	Charles E. Larson	Cover
10502	SA 105	Charles E. Larson	Disk
36996	SA 638 Gr. 660T2	Charles E. Larson	Gasket Retainer
126376	SA 105	Charles E. Larson	Drain Cap (2)
116792	SA 105	Charles E. Larson	Test Fitting



(1) For manually operated valves only.

* Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8-1/2" x 11", (2) information in items 1, 2 and 5 on this Data Report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded at top of this form.

d(3)-1

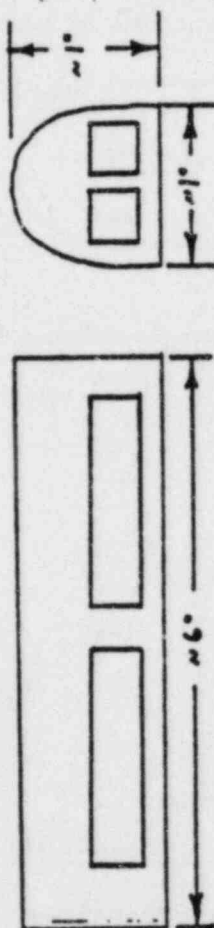
1811 F0032B

+2/04 1210/926

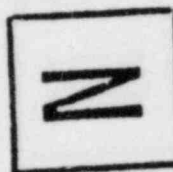
HEAT NO.	PART NO.	MO. PCS.	SRL NO.	ORDER NO.	SPEC.	YS PH	TS PH	ELONG IN %	RED AREA %	MIN	CHARACTERISTICS	C	Mn	P	S	Si	C	Ni	Mo	Cu	Al	B	Y	Z	Cu	
4810433	126	925	1	120	70847	ASME SA-216 MCC 01025	80000 SECTION 11/111 1974 EDITION 975 ADDENDUM, CODE 1	25.0	55.5		50.0 43.0 MO 67.0 56.0 MO 57.0 48.0 MO 25 MIN Required	.19	1.20	008	.010	.54	.11	.15	.12	.16	.05	.0005	.0021	.0050	.0004	.0105
NOTE: TEST SPECIMEN RECEIVED & INSULATED TEST WELD HEAT TREATMENT AT 1100°F FOR 16 HOURS.												THIS MATERIAL WAS MANUFACTURED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION III, PARAGRAPH H03.00.														
HEAT TREAT INFORMATION 1300°F for 6 Hours - Normalize 1250°F for 6 Hours - Temper												WE HEREBY CERTIFY THAT THE HEAT TREATING AND METALLURGICAL DATA RELATIVE TO THE ANALYSES AND PHYSICAL PROPERTIES OF THE MATERIAL DESCRIBED ARE TRUE AND ACCURATE														
ALL WELD STRESS RELIEVED A MINIMUM OF ONE HOUR PER INCH OF THICKEST WELD DEPOSIT, SO LONG AS THE TEMPERING TEMPERATURES.												RECEIVED BY: WAVER CHIEF OF METALLURGICAL SERVICES														
OPERATIONS NOT PERFORMED, IT AND A Final N.T. Inspection B Final Stress Rel. etc																										

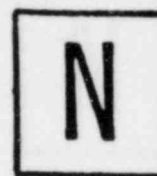
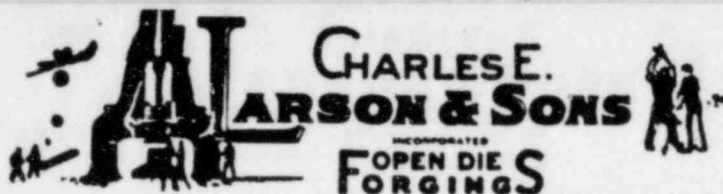
LOCATION AND ORIENTATION OF IMPACT SPECIMENS

LOCATION AND ORIENTATION OF IMPACT SPECIMEN



Rockwell International
Customer: Cleveland Electric Illuminating Co.
Rockwell B. O. No. 36-24401
Component: Badly
Inspection Code: P.C.
APPROVED BY: P.C.
Q. A. Representative: P.C.
Authorized Inspector: P.C.
Date: 10-7-81
Date: 12-8-81





TO

Rockwell Int.
Raleigh, North Carolina 27603

Attn: John Gramack

Customer <u>Cleveland Electric Illuminating Co.</u>	
Rockwell S. O. No. <u>316-24401</u>	Traceability Code <u>NA</u>
Component <u>Cover</u>	
APPROVED BY: <u>P.C. [Signature]</u>	Date <u>10-8-81</u>
Q. A. Representative	Date <u>10-8-81</u>
Authorized Inspector	

CUSTOMER ORDER NO.	DATE SHIPPED	HEAT NO.	SPECIFICATION-GRADE
36-72242-C	9-30-81	116447	ENF-01112 ASME SA-105 C-1029
ITEM	QUANTITY	DESCRIPTION	

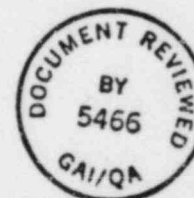
8 ✓ 00196516-24401-01 Pancake forging made, normalized and tempered as per Drg. No. A-196516 Rev. 0
17-3/4" Dia. x 7-1/8" Thick

✓ The forgings were heated to 1700°F., held at temp for one hour and air cooled. The forgings were re-heated to 1250°F., held at temp for 8 hours and air cooled. The test specimen received an additional tempering, at 1125°F., for 16 hours and air cooled.

✓ Forgings comply with B & FV Code Sections II & III Cl. 1 1974 Edition thru Winter 1975 Addenda, Sec. III Para. WCA-3800 & Per Larson QC Manual Rev. 4 Dated 9-1-81.

Charpy Impact Test @ = +33°F

Ft. Lbs.	Mils Lateral Expn.	% Shear
76	57	50
85	62	50
89	70	50



REPORTED LADLE ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Co	Cb
.27	1.05	.010	.011	.21						.01	
Te	Al	Sn	Fe	Ti	B	Pb	W				

MECHANICAL PROPERTIES

HARDNESS	TENSILE (PSI)	YIELD (PSI)	%ELONG. IN 2"	%RED. IN AREA
HHN 156	75,000	49,500	38%	68%

ULTRASONIC TEST RESULTS

GRAIN SIZE	JOMINY HARDENABILITY BY 1/16"															
	1	2	3	4	5	6	7	8	9	10	12	14	16	20	24	28

SUBSCRIBED AND SWORN TO BEFORE ME

CHARLES E. LARSON & SONS, INC.

THIS 30th DAY OF September, 1981

[Signature]
NOTARY PUBLIC

[Signature]

FORGERS OF CARBON, ALLOY, STAINLESS & TOOL STEELS, COPPER, MONEL, INCONEL,
MY COMMISSION EXPIRES OCTOBER 10, 1981 HIGH TEMPERATURE & EXOTIC METALS

d(3)-3

FORM NPV-1 MANUFACTURERS' DATA REPORT FOR NUCLEAR PUMPS OR VALVES*

As Required by the Provisions of the ASME Code Rules

1. Manufactured by ANCHOR/DARLING VALVE CO., HAYWARD, CA. Order No. 5220-02
(Name & Address of Manufacturer) NPL #22-P004
2. Manufactured for GENERAL ELECTRIC, SAN JOSE, CA. Order No. 205-AG-103
(Name and Address) Item 03
3. Owner CLEVELAND ELECTRIC ILLUMINATING COMPANY
4. Location of Plant PERRY NUCLEAR POWER PLANT, NORTH PERRY, OHIO
5. Pump or Valve Identification SERIAL P 1N176 12" 655# GATE

ASME SECTION III

(Brief description of service for which equipment was designed)

STEAM AND WATER SERVICE IN A COMMERCIAL NUCLEAR POWER PLANT

- (a) Drawing No. 2997-3 Prepared by E.O. HOOK
- (b) National Board No. NA
1575 100
6. Design Conditions 1512 psi 700 °F or Pressure Class 655# (1)
(Pressure) (Temperature)
7. The material, design, construction, and workmanship complies with ASME Code Section III, Class I
- Edition 1971, Addenda Date Winter '73, Case No. 1567, 1637

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
BODY HT. 6381E SN 2	SA216 WCB	ANCHOR/DARLING	VULCAN
BONNET HT. 6667E SN 2	SA216 WCB	ANCHOR/DARLING	VULCAN
DISC HT. 6595E SN 1G	SA216 WCB	ANCHOR/DARLING	VULCAN
(b) Forgings			
BACKSEAT HT. 213319	SA105	ANCHOR/DARLING	AIRCO VIKING
DRAIN COIN. BODY HT. 213981	SA105	ANCHOR/DARLING	AIRCO VIKING
DRAIN COIN. BONN. HT. 213981	SA105	ANCHOR/DARLING	AIRCO VIKING

(1) For manually operated valves only

*Supplemental sheets in form of lists, sketches or drawings may be used provided: (1) size is 8 1/2" x 11", (2) information in items 1, 2, 3a and 5b on this data report is included on supplemental sheets, and (3) each sheet is numbered and number of sheets is recorded at top of this form.

This form (E 9001), may be obtained from the Order Dept., ASME, 345 E. 47 St., New York, N.Y. 10017.

d(4)-1

FORM NPV-1 (back)

Mark No.	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
BONNET STUDS CODE 6C	A193 B7	ANCHOR/DARLING	RALPH KNUDTSEN
BONNET NUTS CODE A9	SA194-2H	ANCHOR/DARLING	VITCO
(d) Other Parts			
SEAT RING HT. 10379-11-1	SA515 Gr. 70	ANCHOR/DARLING	KAYSER
PIPE HT. JA2405	SA106	ANCHOR/DARLING	GULF STATES TUBE

B. Hydrostatic test 2460 psi.

CERTIFICATION OF DESIGN

Design information on file at CLEVELAND ELECTRIC
 Stress analysis report on file at NA
 Design specifications certified by CLYDE T. NYE (I) Prof. Eng. State CA Reg. No. 15587
 Stress analysis report certified by S.T. YAMAHARA (I) Prof. Eng. State CA Reg. No. 23521
 (I) Signature not required. List name only.

We certify that the statements made in this report are correct.

Date July 19 19 76 Signed ANCHOR/DARLING CO. By [Signature]
 (Manufacturer)
 Certificate of Authorization No. N-781 expires March 4, 1977

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of Province of CALIFORNIA and employed by LUNBERMENS MUTUAL of LONG GROVE, ILLINOIS have inspected the equipment described in this Data Report on 7-19 19 76, and state that to the best of my knowledge and belief, the Manufacturer has constructed this equipment in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the equipment described in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 7-19 19 76

John J. Carroll
 (Inspector)

CA 1309
 (National Board, State, Province and No.)

VULCAN STEEL FOUNDRY CO.

Carbon and Alloy Steel Castings

2809 CHAPMAN STREET • OAKLAND, CALIF. 94601

PHONE (415) 261-5305

MATERIAL TEST REPORT

DATE 6-1-75

ANCHOR VALVE CO.
24747 CLAWITER RD.
HAYWARD, CALIFORNIA 94545

ASME Section III
Winter 1973 Addenda

MATERIAL SPECIFICATION: ASME SA-216 WCB

HEAT NUMBER: 6381 E

PO/JOB NUMBER 4076-5221-02 PATTERN NUMBER 1192-5-1 SERIAL NUMBER 1-2

MATERIAL MARKED BY: Heat and Serial Numbers (Metal Stamp)

NORMALIZED @ 1700 °F 2 HRS 30 MIN - AQ - DATE 6-1-75 CH5175A
STRESS RELIEVED @ °F HRS MIN - AQ - DATE
SOLUTION ANNEALED @ °F HRS MIN - WQ - DATE
OTHER TREATMENT 1150 7 DATE 9-11-75 OWT

PROC 1822-1 REVE

Chemical Properties

.20 Carbon ✓
.96 Manganese ✓
.15 Silicon ✓
.018 Phosphorus ✓
.020 Sulfur ✓
Nickel
Chromium
Molybdenum
Columbium
Copper

Mechanical Properties

83,800 Tensile Strength, psi
62,500 Yield Point, psi
31 Elongation (%)
62.1 Reduction of Area (%)

Charpy Impact Test

(V-Notch)
Temperature +10 °F

1
53.1 Ft Lbs
95 Shear
.053 Expansion

2
59.9 Ft Lbs
95 Shear
.050 Expansion

3
53.6 Ft Lbs
95 Shear
.050 Expansion



We hereby certify that this material meets all requirements of the material specification and all applicable special requirements of (Article 1 of the ASME Pump and Valve Code [Draft]) or (Article 1 of the ASME Section III, Boiler and Pressure Vessel Code).

Temper Performed on Test Bars only.

10-21-75
(DATE)

QUALITY CONTROL MANAGER

d(4)-3

VULCAN STEEL FOUNDRY CO.

Carbon and Alloy Steel Castings

2909 CHAPMAN STREET • OAKLAND, CALIF. 94601

PHONE (415) 261-5305

MATERIAL TEST REPORT

ANCHOR VALVE CO.
24747 CLAWITER RD.
HAYWARD, CALIFORNIA 94545

DATE 10-2-75

MATERIAL SPECIFICATION ASME SA-216 ✓

ASME Section III
Winter 1973 Addenda

HEAT NUMBER: 6657 E

PO JOB NUMBER 4076-5221-02 PATTERN NUMBER 5174-1-5-2 SERIAL NUMBER 1-2

MATERIAL MARKED BY: Heat and Serial Numbers (Metal Stamp)

NORMALIZED @ 1700 °F 2 HRS. MIN - AQ - DATE 10-6-75 CH10675A

STRESS RELIEVED @ 1700 °F 2 HRS. MIN - AQ - DATE

SOLUTION ANNEALED @ 1700 °F 2 HRS. MIN - WQ - DATE

OTHER TEMPLER 1150 6 30 DATE 10-30-75 CT

PROC 1322-1 REV E

Chemical Properties

.22 Carbon ✓
.85 Manganese ✓
.46 Silicon ✓
.019 Phosphorus ✓
.027 Sulfur ✓
Nickel
Chromium
Molybdenum
Columbium
Copper

Mechanical Properties

75,800 Tensile Strength, psi
47,400 Yield Point, psi
29.5 Elongation (%)
51.4 Reduction of Area (%)

Charpy Impact Test

(V-Notch)
Temperature: 10 °F

1
87.4 Ft Lbs
80 Shear
.078 Expansion

2
72.6 Ft Lbs
80 Shear
.078 Expansion

3
92.4 Ft Lbs
80 Shear
.078 Expansion



We hereby certify that this material meets all requirements of the material specification and all applicable special requirements of (Article 1000 of the ASME Pressure Vessel Code (Draft)) or (Article 113.2000 of the ASME Section III, Boiler and Pressure Vessel Code)

Tested to certified test well heat treatment performed on test bars only.

10-2-75
(DATE)

Donald E. Eison
QUALITY CONTROL MANAGER

d(4)-4

Carbon and Alloy Steel Castings

MATERIAL TEST REPORT

DATE: 9-22-75

MATERIAL SPECIFICATION: ASME SA-216 WCB

ASME Section III
Winter 1973 Addenda

MEAT NUMBER: 6595 E

PO/JOB NUMBER 1-076-5221-02 PATTERN NUMBER 1182-5-4 SERIAL NUMBER 15-16

MATERIAL MARKED BY: Heat and Serial Numbers (Metal Stamp)

NORMALIZED @	1600	°F	2	HRS	MIN	AQ	DATE 9-23-75	CH92375A
STRESS RELIEVED @		°F		HRS	MIN	AQ	DATE	
SOLUTION ANNEAL @		°F		HRS	MIN	WQ	DATE	
OTHER TEMPER	1150		6				DATE 9-25-75	CH T

1322-1 REV E

Chemical Properties	
15	Carbon
39	Manganese
112	Silicon
018	Phosphorus
027	Sulfur
	Nickel
	Chromium
	Molybdenum
	Columbium
	Copper

Mechanical Properties

70,800 Tensile Strength, psi
15,500 Yield Point, psi
33 Elongation (%)
63.5 Reduction of Area (%)

Charpy Impact Test (V-Notch)

Temperature $+10.0^{\circ}\text{F}$
1
12.2 Ft Lbs
15 Shear
250 Expansion

2
L.O. 5 Fl Lbs
4.5 Shear
0.7 Expansion

42.4 Ft Lbs
45 Shear
04.9 Expansion



Due to the none requirement of a PWHT of the disc, new mechanical and impact tests were performed on a specimen that was heat treated similarly to the disc itself. See attachments for proper test results.

We hereby certify that this material meets all requirements of the material specification and all applicable special requirements of Article _____ of the ASME Pump and Valve Code (Draft) or Article 2000 of the ASME Section III, Boiler and Pressure Vessel Code.

Temper Performed on Test Bars Only.

10-22-75
(10:10)

QUALITY CONTROL Manual

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RALPH KNUDTSEN CORP.

45805 WARM SPRINGS BLVD.

FREMONT, CA. 94538

(415) 651-1363

ANCHOR/DARLING VALVE COMPANY
24747 Clawiter Road
Hayward, California 94545

Gentlemen: We hereby certify the bolting manufactured by us
meets the following specifications:

ASTM - SA 193 B-7

CODE # - 6C

HEAT NUMBER - 51981

MILL - TIMKEN

CODE # 6C IS TRACEABLE TO MILL HEAT # 51981

IDENTIFICATION - STUDS ARE STAMPED ON ONE END WITH B7 AND
TRACEABILITY CODE 6C.



SIGNED:

d(4)-6

STEEL DIVISION CERTIFICATE OF TEST

DATE March 21, 1971

SOLD TO:

Coulter Steel and Forge Company
Box 8005
Emeryville, California 94662
Attn: Tom O'Connor

TIMKEN
ORDER 29113

CUSTOMER
ORDER 04520-2.4

SHIP TO:

Coulter Steel & Forge Company
1494 - 67th St.
Emeryville, California 94608

NOTARIZE ☐

ENCLOSURES ☐

SIZE 1.250" RD

DESCRIPTION OF MATERIAL 4140 - Hot Rolled - Quenched - Tempered - Straightened - Stress Relieved
Spec: ASTM-A-193 Grade B-7

HEAT	SPECIMEN SIZE	MECHANICAL PROPERTIES					Brinell HARDNESS	IMPACT
		YIELD Strength P.S.I.	TENSILE P.S.I.	% ELONG. 2 IN.	% RED. AREA			
51981	.505" RD	123,250	135,000	20.5	60.8		293	
	" "	124,000	137,000	19.0	58.3			

CODE - 6C

Quenched at 1550°F for 2 hours
Tempered at 1100°F for 8 hours
Stress Relieved at 1060°F for 7 hours



HEAT	CHEMICAL ANALYSIS									
	C.	MN.	P.	S.	SI.	CR.	NI.	MO.	VA.	CU.
51981	.42	.55	.015	.012	.30	.56	.18	.20		.11

HEAT		FORGED HARDENABILITY DATA															
		1	2	3	4	5	6	7	8	10	12	14	16	20	24	28	32
51981	101	58	53	57	56	56	55	55	55	53	51	48	46	41	39	36	37
	408	57	57	57	56	56	55	55	55	54	52	49	47	43	40	38	37

The Timken Company hereby certifies that the above materials have been inspected and tested in accordance with the methods prescribed in the governing specifications and the results of such inspection and tests conform with the applicable requirements. For properties or characteristics for which no methods of inspecting or testing are prescribed by said specifications, the standard mill inspection and testing practices of the Timken Company have been applied.

WHEN SHIPPING NOTICE IS ATTACHED,
IT REMOVES PART OF THIS CERTIFICATE.

THE TIMKEN COMPANY
STEEL DIVISION

[Signature]
Authorized Signature

who being duly sworn according to the law, say that the facts contained

herein are true and correct according to the best of his knowledge, information and belief.

Notary Public

d(4)-7



ANCHOR/DARLING VALVE COMPANY

24747 CLAWITER ROAD • HAYWARD, CALIFORNIA 94545 • (415) 72
CABLE: ANCORCO • TELEX: 1

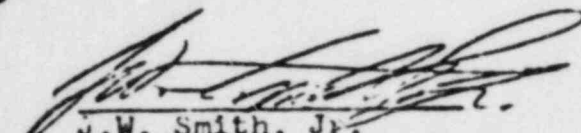
"CERTIFICATION"

Subject: PRESSURE BOUNDARY BOLTING MATERIAL

HT 57853256

CODE A9

We hereby certify that this material meets all the requirements of the material specification and applicable special requirements of NB-2000, ASME Section III, Nuclear Power Plant Components, Winter Addenda 73.


J.W. Smith, Jr.
Quality Assurance Engineer

5/21/76



CERTIFIED TEST REPORT

VITCO NUCLEAR PRODUCTS INC. 13801 360th EAST AVE., (PH) 44091
PHONE AREA CODE 216 946 9550

TO

ANCHOR/DARLING VALVE COMPANY
24747 Clawiter Road
Hayward, CA 94545

DATE SHIPPED	VITCO ORDER NUMBER	CUSTOMER ORDER NUMBER
6-15-76	1489	1810

ITEM 24 Pcs. 1-1/4" -8 Hvy Hex Nuts (Trace. A9)
Tag: 5220-02

SPECIFICATION ASME SA 194, Grade 2H, ASME Section III, Class 1, W-73

CHEMICAL COMPOSITION

HEAT NO	C	Mn	P	S	Si	Cr	Mo	Ni	Cu	Fe	Al	Ti
578S3256	.42	.87	.019	.019	.28	1.00	.18					
	✓	✓	✓	✓	✓							

PHYSICAL COMPOSITION

TENSILE STRENGTH PSI	YIELD PSI	ELONG. % IN 2"	RED. AREA %	HARDNESS	GRAIN SIZE	BEND TEST	MIN. TEMP.
Hardness	Per ASME SA 194, Para.	8.A		30-32 RC			1175°F
Hardness	Per ASME SA 194, Para.	8.B		248 BHN			

ADDITIONAL SPECIFICATION REQUIREMENTS OR SPECIAL TESTS

CONE STRIPPING PROOF LOAD (109,350 Lbs.) SATISFACTORY

ATTACHMENTS

WESTERN COLD DRAWN STEEL CO. MILL TEST REPORT FOR HEAT # 578S3256.
ULTRA LABS., INC. MAGNETIC PARTICLE INSPECTION.

IMPACT STRENGTH V-NOTCH
HARPY BARS @+40°F.
(FT. LBS)

LATERAL
EXPANSION
(IN.)

DUCTILE
FRACTURE AREA
(%)

72.0

.046

100

75.0

.048

100

72.5

.044

100

Average 73.0

I CERTIFY THAT THE ABOVE MATERIAL IS COMMERCIALY FREE FROM MERCURY
CONTAMINATION AND MEETS THE REQUIREMENTS OF SPECIFICATION ASME SA 194,
GRADE 2 H, ASME SECTION III, CLASS 1, S-74, AND YOUR ORDER # 1810.

THE ABOVE TESTS CONFORM TO THE REQUIREMENTS OF THE SPECIFICATION LISTED

APPROVED AND SUBSCRIBED BEFORE ME
ON _____ DAY OF _____ BY A DULY
AUTHORIZED AGENT OF VITCO NUCLEAR
PRODUCTS INC.

WE HEREBY CERTIFY THAT THE ABOVE DATA IS A TRUE COPY
OF THE DATA FURNISHED BY THE PRODUCING MILL OR
OTHER SOURCE OF THE DATA RESULTING FROM TESTS PERFORMED
IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATION LISTED

VITCO NUCLEAR PRODUCTS INC

BY *[Signature]*

ANTHONY R. ASARI

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