



# 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 ADUCK 05000440  
E PDR

Boo!  
1/1

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 S80 (1.031)" NW, normalized, applied in feedwater penetrations (P121 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 A<sub>3</sub> 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.

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\* 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> <sup>(1)</sup> | <u>LSMT</u> | <u>Remarks</u>                                     |
|---|-----------------------------|-------------|--|
| 1. Containment vessel<br>(FSAR 3.8.2.6.1.2)               | 50°F                        | 55°F        | Minimum calculated annulus<br>temperature.         |
| 2. Equip. Hatch/Pers.<br>Air Locks (FSAR<br>3.8.2.6.1.2e) | 55°F                        | 55°F        |  |
| <u>Penetrations</u>                                       |                             |             |  |
| 1. Penetration sleeves<br>(FSAR 3.8.2.6.1.2c)             | 30°F<br>25°F                | 55°F        |  |
| 2. Feedwater pipe<br>HPCS pipe                            | 70°F<br>70°F                | (2)<br>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<br>Valves                         | 65°F<br>34°F<br>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<br>35°F                | 130°F       | All operating conditions;<br>10 year hydro @ 120°F |
| 4. High Press. Core Spray                                 | 65°F<br>24°F                | 82°F        | (3)<br>(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.

1865/1918



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

**SHIP-OUT  
 INSPECTION  
 REPORT**

| FINAL INSPECTION OF MATERIAL LISTED<br>HAS BEEN COMPLETED AND IS RELEASED FOR SHIPMENT |           |           |     |   | <input checked="" type="checkbox"/> COMPANY FURN. MAT'L.<br><input type="checkbox"/> CUSTOMER FURN. MAT'L.<br><input type="checkbox"/> OTHER | J.O.<br>5025-A | FILE NO.<br>X12-214 |
|--|-----------|-----------|-----|---|--|----------------|---------------------|
| DWG. NO.   | DWG. ITEM | P.O. ITEM | QTY | DESCRIPTION   | INSPECTION DATE<br>2-28-78   | DATE<br>5-8-78 |                     |
| 249732<br>Rev. A-3   |           |           |     | Assy 99-2 Double Penetration Assy Horizontal Reinforced<br>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<br>Rev. B-3   |           |           |     |   |  |                |                     |
| 77 NNI 537   | 16        |           | 2   | Half Coupling   |  |                |                     |

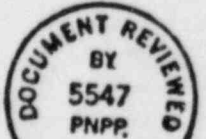
N. N. I. MAY 9 1978  
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Cleveland Electric Illuminating Co.  
 Perry Nuclear Power Plant

**INFORMATION ONLY** - Contract No. P-1117-1

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

DISTRIBUTION:



a(1)-1



PHOENIX EL CORPORATION

CLAYMONT, DELAWARE

SA 516 GR 70 (ASME DESIGNATION A516-73 GR 70) NORM. & IMPACT TESTED  
 IN ACCORDANCE WITH REQS. OF ARTICLE NE-2000 SECT III THRU  
 SUPPL. 1974 AGGENDA & SUPPL. REQTS. 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<br>OK | Homogeneity Test |
|-----------------|------------------|

TO Newport News Industrial Corp.

Newport News, Va, 23607

| SLAB No.                                  | SERIAL No. | CHEMICAL ANALYSIS                            |       |                     |        |     |     |     |     | TEST PIECE |           | Yield Point lbs. Per Sq. In. | Tensile Strength lbs. Per Sq. In. | Elong. In. 2" | SIZE |                               |
|---|------------|--|-------|---------------------|--------|-----|-----|-----|-----|------------|-----------|------------------------------|-----------------------------------|---------------|------|-------------------------------|
|   |            | Carb.  | Mang. | Phos.               | Sulph. | Si. | Cu. | Ni. | Cr. | Mo.        | Thickness |                              |                                   |               |      | Sec. Area                     |
| 87917-26                                  | 83109      | .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<br>ITEM #6 |
| MATERIAL IS FREE OF MERCURY CONTAMINATION |            |  |       |                     |        |     |     |     |     |            |           |                              |                                   |               |      |                               |
| 87917-26                                  | 98109      | L. Exp. .049-.048-.042                       |       | % Shear 50%-50%-40% |        |     |     |     |     |            |           |                              |                                   |               |      |                               |

N. N. I. C. 395  
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PLATE AND TEST PC NORMALIZED AT 1600-1650 Deg.F., HELD FOR ONE HOUR PER INCH OF THICKNESS AND AIR COOLED.

**INFORMATION ONLY**

*Cardigan Miller*

SUBSCRIBED AND SWORN TO BEFORE ME

7th Day of August  
*Louise A. Mabry*  
 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 Perotti*  
 Supr. of Testing, Metallurgical Dept.

0(1)-2

| ITEM NO. | QTY REQD | PART NO. | DESCRIPTION             | MATERIAL | GRADE / TYPE | HEAT NO. | SLAB NO. | LOT NO.  | BATCH NO. | INSTR. / FIG. |
|----------|----------|----------|-------------------------|----------|--------------|----------|----------|----------|-----------|---------------|
| 1        | 6        | 33368-1  | 7x9x60° COLLAR SEGMENTS | SA-516   | GR70         | D3078    | 1        | A20948-3 |           | 38            |
| 2        | 8        | 33368-2  | PLATE - SEGMENT - 45°   | SA-516   | GR70         | D3062    | 3        | A20948-2 |           | 38            |
| 3        | 1        | 33368-3  | DOLLAR PLATE            | SA-516   | GR70         | D3062    | 3        | A20948-1 |           | 38            |
| 5        | 2        | 33368-5  | R 12"x1"x2'-0"          | SA-516   | GR70         | 53219    | 7-2      | A22658-2 |           | 38            |
| 6        | 2        | 33368-6  | R 8"x2 1/4"x1'-7 3/8"   | SA-516   | GR70         | A5034    | 2        | A20952-5 |           | 38            |
| 7        | 2        | 33368-7  | R 8"x2"x2'-3 1/2"       | SA-516   | GR70         | A5034    | 2        | A20952-5 |           | 38            |
| 9        | 4        | 33368-9  | R 12"x1"x1'-0"          | SA-516   | GR70         | D3062    | 3        | A20952-4 |           | 38            |
| 10       | 1        | 33368-10 | R 10"x1/2"x0'-11"       | SA-516   | GR70         | B0999    | 3A       | A22978-5 |           | 38            |
| 11       | 4        | 33368-11 | R 8"x3/4"x0'-9 1/4"     | A-36     | —            | 12773    |          | A18822-3 |           | 38            |
| 12       | 2        | 33368-12 | R 9 1/4"x3/4"x0'-9 1/4" | A-36     | —            | 12773    |          | A18822-3 |           | 38            |

MURDOCK, INC.  
DRAWING CONTROL  
DIVISION II  
COPY NO. 3  
DATE 5-9-78

EFFECTIVITY  
3-1671-03  
J/S WOL

NUCLEAR

COMPLETED DRAWING REVIEWED  
AND ACCEPTED BY: Woolley 5478  
QUALITY ENGR

THIS DWG FORMS PART OF THE AS CONSTRUCTED DRAWING

DRAWN: D. Woolley DATE: 5-4-78  
NEXT: ASBY  
UNLESS OTHERWISE SPECIFIED  
DIMENSIONS APPLY AFTER PLATING  
REMOVE ALL BURRS  
BREAK ALL SHARP EDGES 50S-010  
TOLERANCES: DECIMALS ± .005  
                  DECIMALS XX ± .002  
                  DECIMALS XXX ± .001  
                  ANGLES ± .5

MURDOCK, INC.

15000 So. Avalon Compton, California 90220 Phone 376-022 (213)

NAME: BILL OF MATL, HATCH COVER  
S/N 33366  
CUSTOMER: WOOLLEY NUMBER: ACD-33368 REV: N/C  
JOB NO: 3-1671 SCALE: NONE SHEET 1 OF 1

ACD-33368

0(2)-1

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

CONSUMER SERVICE DEPARTMENT

COASTVILLE, PA. 15302  
**TEST CERTIFICATE**

DATE: **6-7-76** FILE # **4205-02-01**  
CONDITIONS  
KAISER STEEL CORP.  
PLANT #1  
13032 SLOVER AVE.  
KAISER, CALIF.

WILL ORDER NO.  
70666-1

CUSTOMER P.O.  
45131201

MP 6376 DD  
1/14

*A. J. Gilmore*

ALL TESTS WERE MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS

Revised Copy 3-29-77

SA-516 GR. 70 ASME CODE SECT. II & III SUB. NE 1974 EDITION THRU SUMMER 1974 ADDENDUM 1 & 1977  
N-1160 8/4/78

WELD TEST Q. K. HOMOGENEITY TEST

**CHEMICAL ANALYSIS**

| WELD NO. | C  | Mn   | P    | S    | Cu | Si  | Ni | Cr | Mo | V | Ti | XXR | XXR | GRAIN     | BASIC PROC. |      |
|----------|----|------|------|------|----|-----|----|----|----|---|----|-----|-----|-----------|-------------|------|
|          |    |      |      |      |    |     |    |    |    |   |    |     |     | SIZE      |             |      |
| 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 3-9-77

**PHYSICAL PROPERTIES**

| WELD NO. | SLAB NO. | YIELD STRENGTH | TENSILE STRENGTH | % ELONG. IN 2" | % RA | ENH | IMPACTS                     |      |      | FRACTURE APPEARANCE & SHEAR | DESCRIPTION       |
|----------|----------|----------------|------------------|----------------|------|-----|-----------------------------|------|------|-----------------------------|-------------------|
|          |          |                |                  |                |      |     | V 0°F.                      |      |      |                             |                   |
| 03078    | 1        | 590<br>595     | 815<br>805       | 30<br>29       |      |     | T 43                        | 42   | 42   | 40-40-40                    | 1- 7" x 102 x 132 |
|          |          |                |                  |                |      |     | L110                        | 108  | 110  | 90-90-90                    |                   |
|          |          |                |                  |                |      |     | LATERAL EXPANSION IN INCHES |      |      |                             |                   |
|          |          |                |                  |                |      |     | T.038                       | .037 | .038 |                             |                   |
|          |          |                |                  |                |      |     | L.086                       | .088 | .087 |                             |                   |

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  
224

*A. J. Gilmore*

**KAISER  
STEEL**

METAL PRODUCTS DIVISION  
P O BOX 150 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

INTEGRAL EAR

|              |                      |
|--------------|----------------------|
| 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 Part I  
a(2)-3

12/11/69

P104



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

SHIP-01  
INSPEC.  
REPORT

|   |  |  |  |  |                 |          |
|---|--|--|--|--|-----------------|----------|
| DATE INSPECTION OF MATERIAL LISTED          |  |  |  | <input checked="" type="checkbox"/> COMPANY FURN. MAT'L.<br><input type="checkbox"/> CUSTOMER FURN. MAT'L.<br><input type="checkbox"/> OTHER | Q. 5025-A       | 1.       |
| MATERIALS SHIPPED AND RECEIVED FOR SHIPMENT |  |  |  |  | INSPECTION DATE | 11-30-77 |

| CR. NO. | PRG. ITEM | MAT. ITEM | QTY | DESCRIPTION  |
|---------|-----------|-----------|-----|--|
|         |           |           |     | <b>Assy 99-1 Six Sleeve Penetration Assy Special - Unit #1 Containment Vessel</b>          |
|         |           |           |     | <b>249752 Rev. A-3</b>   |
|         |           |           |     | <b>16 NNI 359</b>  |
|         | 1         |           | 2   | Sleeve Steel See Assy 90 Dwg. 249703   |
|         |           |           |     | <b>6 NNI 310</b>   |
|         | 2         |           | 2   | Sleeve Steel See Assy 88 Dwg. 249703   |
|         |           |           |     | <b>6 NNI 240</b>   |
|         | 3         |           | 1   | Sleeve Steel See Assy 95 Dwg. 249703   |
|         |           |           |     | <b>16 NNI 326</b>  |
|         | 4         |           | 1   | Insert Plate 1 1/2"  |
|         |           |           |     | <b>6 NNI 396</b>   |
|         | 5         |           | 1   | Reinf Penetration Assy. see assy Dwgs. 249721 Rev. A-3<br>see assy 92 Dwg. 249703 Rev. B-3 |
|         |           |           |     | <b>249703 Rev. B-3 I 537</b>   |
|         | 16        |           | 6   | Half Couplings   |

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|  |  |
|--|--|
| TO IDENTIFICATION<br><input type="checkbox"/> MANUFACTURE CERT.<br><input type="checkbox"/> SHIPPING PAPERS<br><input type="checkbox"/> EQUIPMENT HISTORY<br>OTHER IDENTIFY: | APPLICATION: 10250<br>BY: CLEVELAND MARINE CO<br>DATE: 1-2-77<br>AUTHORIZED INSPECTOR: N/A |
|--|--|

SHIP. NO. 5025-A-2  
SHEET 2 OF 9

b(1)-1

# INFORMATION ONLY

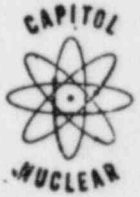


## Capitol

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.

76NDW1310  
OK TO SPEC  
8/17/76  
DO NOT ACCEPT  
SHEET 1 OF 3

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. 356  
RECORD CENTER  
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QUALITY ASSURANCE

QUALITY ASSURANCE

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

Item# 1

**PHENIX STEEL CORPORATION INFORMATION ONLY**

TUBE DIVISION  
PHOENIXVILLE, PENNA.

CERTIFICATE OF INSPECTION AND TESTS

12" 5/120 SA 6

|                            |  |  |
|----------------------------|--|--|
| DATE: 6-14-75              | DATE SHIPPED: 6-10-76  | MILL ORDER NO. T-8986-C (54D)  |
| S<br>O<br>L<br>D<br>T<br>O | Capitol Pipe & Steel Prod., Inc.<br>Div. of PAS International, Inc.<br>P. O. Box 471<br>Bala Cynwyd, Pa. 19004 | CUSTOMER ORDER NO. 77653-00  |
|                            |  | CAR NO. RDG 38869  |
|                            |  | MATERIAL: SEAMLESS <input type="checkbox"/> PIPE <input type="checkbox"/> TUBE, HOT FINISHED |
| S<br>H<br>I<br>P<br>T<br>O | 7ENN1310   | N. N. I. C. 286  |
|                            | ASTM A-333-75 Gr. 6,<br>ASME SA-333 Gr. 6 (O.H.)   |  |

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**FILE COPY**

|             |                                 |        |           |           |                |
|-------------|---------------------------------|--------|-----------|-----------|----------------|
| NO. PCS. 00 | WALL THICKNESS 12.750" x 1.000" | LENGTH | TOTAL FT. | TOTAL WT. | HEAT NO. 65326 |
|-------------|---------------------------------|--------|-----------|-----------|----------------|

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  
SIGN  
*Handwritten Signature*  
6-17-76

SHEET 3 OF 3

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

Normalized. Equalized at 1650°F. plus 25°F. minus 0°F. Held for 1 hour and air cooled.  
(.505" Test Specimen)

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

*Handwritten Signature*  
Notary Public  
PHOENIXVILLE BOROUGH, CHESTER COUNTY  
MY COMMISSION EXPIRES OCT. 29, 1979

|                         |            |              |                      |
|-------------------------|------------|--------------|----------------------|
| JOINTLY DISTANCE - 16TH | ROCKWELL C | FLATTLING 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.

*Handwritten Signature*  
ENGINEER OF TESTS



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

P122

SHIP-OUT  
 INSPECTION  
 REPORT

| FINAL INSPECTION OF MATERIAL LISTET<br>HAS BEEN COMPLETED AND IS RELEASED FOR SHIPMENT |                                      |     |  | <input checked="" type="checkbox"/> COMPANY FURN. MAT'L<br><input type="checkbox"/> CUSTOMER FURN. MAT'L<br><input type="checkbox"/> OTHER | I.A. NO.<br>5025-A<br>INSPECTION DATE<br>8-25-77 | D.P. NO.<br>X12-20<br>DATE |
|--|--------------------------------------|-----|--|--|--|----------------------------|
| QTY  | P.O. ITEM                            | QTY | DESCRIPTION  |  |  |                            |
| 1  | 24975Y<br>REV. B-2<br>77WJ577        | 1   | ASSEMBLY: GUNWIRE RESTRAINT ASSY. COURSE #7<br>SHELL PLATE |  |  |                            |
| 4  | 764J242                              | 4   | SLEEVES OR OAG 24975Y REV. B-2 COURSE                      |  |  |                            |
| 4  | DRL<br>249703<br>REV. B-3<br>77WJ577 | 4   | HMF COUPLING   |  |  |                            |

AUG 29 1977

N. N. I. C.  
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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<br><b>VISUAL INSPECTION</b><br><input type="checkbox"/> MARKING<br><input checked="" type="checkbox"/> SURFACE<br><input type="checkbox"/> CLEANLINESS<br><input type="checkbox"/> GRADE _____<br><input type="checkbox"/> AS REC'D FOR SHIP-OUT<br><input type="checkbox"/> PRM. CLEAN TAG<br><input type="checkbox"/> PLUG WARNING TAG<br><b>DIMENSIONAL INSP.</b><br><input checked="" type="checkbox"/> WELD PREP<br><input checked="" type="checkbox"/> OVERALL | <b>DOCUMENTATION</b><br><input type="checkbox"/> MANUFACTURE CERT.<br><input type="checkbox"/> SHIPPING PAPERS<br><input type="checkbox"/> EQUIPMENT HISTORY<br>OTHER (SPECIFY) _____<br><b>SHIPPING TRANSPORTATION</b><br><input type="checkbox"/> _____  |
|   | NNI CHARGE/P.O./J.O. NO. <u>5025A</u><br>NNI SHIPMENT NO. _____<br>SHIPPED TO <u>CLEVELAND ILLUM.</u><br><u>PERRY SITE</u><br><u>CLEVELAND, OHIO</u><br>ENGINEERING INSTRUCTION <u>N/A</u><br>REV. _____<br>QA INSPECTOR <u>D.J. Day</u> DATE <u>8-25-77</u><br>CUSTOMER INSPECTOR <u>N/A</u> DATE _____<br>AUTHORIZED INSPECTOR <u>N/A</u> DATE _____ |

DISTRIBUTION:  
 1. Record Center NNF  
 1. J.H. Brown X10





# 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 | SI | N | CR | MO | V | Ti | AL | B | GRAIN SIZE |
|----------|----|------|------|------|----|----|---|----|----|---|----|----|---|------------|
| C6894    | 22 | .93  | .012 | .018 |    |    |   |    |    |   |    |    |   | 7-8        |
| D2977    | 21 | 1.07 | .012 | .017 |    |    |   |    |    |   |    |    |   | 7-8        |
| A4859    | 24 | 1.04 | .004 | .021 |    |    |   |    |    |   |    |    |   | 7-8        |
| D3161    | 22 | 1.00 | .009 | .020 |    |    |   |    |    |   |    |    |   | 7-8        |
| C6913    | 21 | 1.04 | .012 | .020 |    |    |   |    |    |   |    |    |   | 7-8        |
| D3168    | 22 | 1.04 | .007 | .020 |    |    |   |    |    |   |    |    |   | 7-8        |

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 N. N. I. C.  
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CK TO  
 REC.  
*[Signature]*  
 8-4-76  
 SHEET 1 OF 2

**PHYSICAL PROPERTIES**

| MELT NO. | SLAB NO. | YIELD PSI @100 | TENSILE PSI @100 | % ELONG. IN 8" | % R.A. | BHN | IMPACTS<br>LV OFF. | FRACTURE APPEARANCE | DESCRIPTION                      | ITEM # |
|----------|----------|----------------|------------------|----------------|--------|-----|--------------------|---------------------|----------------------------------|--------|
| C6894    | 11B      | 450            | 743              | 27             |        |     | 71 70 72           | 70-70-70            | 1- 1-1/2" X 90 X 205<br>76NNI238 | 2      |
| D2977    | 7U       | 452            | 755              | 30             |        |     | .069 .066 .068     | 70-70-70            | 1- 1-1/4" X 60 X 188<br>76NNI239 | 3      |
| A4859    | 3T       | 456            | 780              | 28             |        |     | .066 .067 .064     | 50-50-50            | 1- 1-1/8" X 60 X 225<br>76NNI240 | 4      |
| D3161    | 7A       | 515            | 736              | 29             |        |     | 58 60 56           | 70-70-70            | 1- 1" X 90 X 366<br>76NNI241     | 5      |
|          |          |                |                  |                |        |     | .052 .055 .051     |                     |                                  |        |
|          |          |                |                  |                |        |     | 70 70 66           |                     |                                  |        |
|          |          |                |                  |                |        |     | .062 .066 .065     |                     |                                  |        |

We hereby certify the above information is correct.

SUPERVISOR TESTING

*[Signature]*

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 SPECIFICATION(S):

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 | A | B |
|---|---|----|---|---|----|----|----|----|----|---|----|---|---|
| <div style="border: 1px solid black; padding: 10px; display: inline-block;"> <p style="margin: 0;">N. N. I. C. 269<br/>RECORD CENTER<br/>FILE COPY</p> </div> <div style="border: 1px solid black; padding: 10px; display: inline-block; margin-left: 20px;"> <p style="margin: 0; text-align: center;">OK TO<br/>SPEC<br/><i>Handwritten Signature</i><br/>8-4-76<br/>ACCEPTED<br/>SHEET 2 OF 2</p> </div> |   |    |   |   |    |    |    |    |    |   |    |   |   |

### PHYSICAL PROPERTIES

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

We hereby certify the above information is correct.

SUPERVISOR TESTING

*F. St. Line*

714/2265

29-75-1004 OF FIG. 7-29

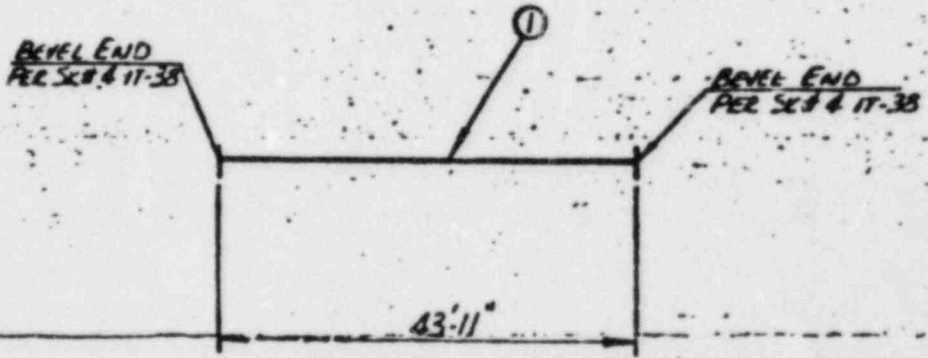
NOTES

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

IMPACT TEST PROPERTIES REQD

5. NO SHIP PAINT

|   |                        |                            |               |
|---|------------------------|----------------------------|---------------|
| DATE: 11-16-64                          | PROJECT: N27-FEEDWATER | NO. 80                     | SHEET NO. 207 |
| EST. NO. 9175                           | INSPECTOR              | BEVEL ENDS                 | CLEAR         |
| REF. Dwg. A-312-201 4/6 & B-312-650 4/4 |                        | AS NOTED SEE PART 1/3-11-3 |               |



PERBY NUCLEAR POWER PLANT UNIT 1  
 THE GEORGE W. BUSH COAL CO.  
 ELECTRIC LIGHT CO. OF EDISON CO.  
 P.O. BOX 1000 EDISON CO.  
 CONTRACT NO. P-1144  
 PURCHASE ORDER NO. \_\_\_\_\_

LINE SPEC: DI-1

| REV. | DATE     | BY | DESCRIPTION  | MATERIAL          | SPCS.           | QUANTITY | UNIT                   | TOTAL | DIST. | NET |
|------|----------|----|--|-------------------|-----------------|----------|------------------------|-------|-------|-----|
| 1    | 11/16/64 |    | ADD INTO S.E.  | 20" PIPE ASSEMBLY |                 |          |                        |       |       |     |
|      |          |    |  | CARB. STL. ASSY   |                 |          |                        |       |       |     |
| 1    | 1        | 1  | 20" SMLS. PIPE PER SEC. III-1                            |                   |                 |          |                        |       |       |     |
| 2    | 2        | 2  | 20" - End Friction with 48 bolts of S.S. per spec XIII-3 |                   | LOT             | STOCK    |                        |       |       |     |
|      |          |    |  | DESCRIPTION       | PRICE PER PIECE |          | TOTAL PRICE THIS ORDER |       |       |     |
|      |          |    |  | LABOR             |                 |          |                        |       |       |     |

b(2)-1

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 of Serial No. | CHEMICAL ANALYSIS |     |      |      |     |    |    |    |
|---------------|------------------------|-------------------|-----|------|------|-----|----|----|----|
|               |                        | C                 | MN  | P    | S    | SI  | CR | NI | MO |
| <u>L 3768</u> |                        | .24               | .89 | .025 | .025 | .27 |    |    |    |

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

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. | MECHANICAL PROPERTIES |                             |                   |                |           |                         |  | V-Notch Impact +30°<br>Ft.Lbs. Lat.Exp. %D/ |
|------------------------|---------------|-----------|-----------------------|-----------------------------|-------------------|----------------|-----------|-------------------------|--|---|
|                        |               |           | Tensile<br>PSI        | .2 % Offset<br>Yield<br>PSI | % Elong.<br>2 in. | % Red.<br>Area | Test Lot# | Flan-<br>geling<br>Test |  |   |
| 3                      | <u>L 3768</u> | rans.     | 74,900                | 41,700                      | 28.1              | 53.3           | * 957     | OK                      | 65.0 ✓ 59 ✓ 71LS 72%<br>64.0 ✓ 54 ✓ 58<br>56.0 ✓ 50 ✓ 58 |   |

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. # | Best Lot# |
|----------------|-----------|
| 22387          | 957       |
| 28583          | 957       |
| 28590          | 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, Int



02-NT677

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. | Mg. | 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 [Signature]  
 11/21/77 BY [Signature]

DOCUMENT REVIEWED  
 BY 8202  
 PNPP  
 GAI/QA

|                                   |               |                      |
|-----------------------------------|---------------|----------------------|
| JOURNEY DISTANCE 1631             | 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.

*A. W. Beckwith*  
 ENGINEER IN CHARGE

# LADISH CO.

CUDAHY • WISCONSIN • 53110

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

CE N1209

## METALLURGICAL MATERIAL ANALYSIS REPORT

|  |                  |                    |
|--|------------------|--------------------|
| CUSTOMER ORDER NO.                                       | LADISH ORDER NO. | LADISH INVOICE NO. |
| 34-N1222   |                  |                    |
| *SHIP TO CUSTOMER'S ORDER NO. ORDER NO. INVOICE NO. ETC. |                  |                    |
| REVISED REPORT 8-18-77                                   |                  |                    |
| DATE SHIPPED   | DATE OF REPORT   |                    |
| 6-23-77  | 8-29-77          |                    |

| ITEM | PCS. | SPECIFICATION                                | DESCRIPTION               | CODE           | HEAT NO.          |          |        |
|------|------|--|---------------------------|----------------|-------------------|----------|--------|
| 5    | 2    | ASME SA234 WPB Per*                          | 12 X 6 S/100 90 LR RED EL | YK31G          | 168652            |          |        |
| C    | .27  | Mn 1.50 P .008 S .010 Si .16 Ni Cr Mo Cu V N |                           | YIELD KSI 48.4 | ULTIMATE KSI 71.5 | % EL. 36 | % RED. |

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. Ser. #'s 884 & 885.

CE N1213

| ITEM | PCS. | SPECIFICATION                               | DESCRIPTION         | CODE           | HEAT NO.          |          |           |
|------|------|---|---------------------|----------------|-------------------|----------|-----------|
| 5    | 1    | ASME SA234 WPB Per*                         | 24 X 16 STD RED TEE | VL3GT          | 168652            |          |           |
| C    | .23  | Mn .89 P .005 S .010 Si .18 Ni Cr Mo Cu V N |                     | YIELD KSI 45.4 | ULTIMATE KSI 69.9 | % EL. 33 | % RED. 54 |

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. Ser. #882.

CE N1222

| ITEM | PCS. | SPECIFICATION                               | DESCRIPTION      | CODE           | HEAT NO.          |          |           |
|------|------|---|------------------|----------------|-------------------|----------|-----------|
| 8    | 9    | ASME SA234 WPB Per*                         | 12 S/60 90 LR EL | YK31G          | 168725            |          |           |
| C    | .24  | Mn .87 P .008 S .011 Si .19 Ni Cr Mo Cu V N |                  | YIELD KSI 45.7 | ULTIMATE KSI 70.2 | % EL. 33 | % RED. 87 |

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. Ser. #'s 887 thru 895.

### INFORMATION ONLY

| ITEM | CHARPY (SIZE) | V NOTCH | TEMP. °F | FOOT POUNDS  | % 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  
7/16/77  
7/28/77 BY JO

ALL STARTING MATERIAL CONFORMS TO CHEMICAL ANALYSIS REQUIREMENTS OF ASME SA106 Gr. B Pipe.  
ALL FITTINGS HAVE A MAXIMUM HARDNESS OF 1728177 BY JO  
FITTINGS CONFORM TO THE REQUIREMENTS OF MSS-SP-75

| ITEM | TENSILE SPECIMEN     |
|------|----------------------|
| 603  | STD. RD.             |
|      | FULL SEC.            |
| 5    | STRIP                |
| ITEM | HEAT TREATMENT       |
| 5    | NOT REQUIRED         |
|      | STRESS RELIEVE       |
| 603  | NORM 1650 °F         |
|      | NORM 1750 °F         |
|      | TEMPER 1300 °F       |
|      | WATER QUENCH 1650 °F |
|      | TEMPER               |
|      | WATER QUENCH 1650 °F |
|      | TEMPER 1200 °F       |

THIS MATERIAL CERTIFIED TO ACCEPTED PER  
WELDING RADIOGRAPHICALLY INSPECTED PER  
1974 ASME CODE  
FITTINGS CAPABLE OF CONFORMING TO HYDROSTATIC TEST REQUIREMENTS  
SECTION II  
PULLMAN POWER PRODUCTS  
QUALITY ASSURANCE DEPARTMENT  
BY *jm* DATE 7/16/77

DOCUMENT REVIEWED  
BY 8202  
PNPP  
GAI/QA

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

My commission expires August 17, 1980. b(2)-4  
I own and subscribe to this report on June 77  
before me this 26th day of June 1977  
*Rosanne Zajac*



# 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   |                    |              |               |                   |     |      |      |      |    |    |    |    |  |  |  |  |
|--|--|-----------------------|---|--------------------|--------------|---------------|-------------------|-----|------|------|------|----|----|----|----|--|--|--|--|
| A223 SA223<br>ASME Section III Class 1<br>157- Ed. Winter 75 Add.<br>& MK IV-20, IV-33 and<br>VIII-1 |  | 6                     | 12" SCH 80 (SA223 WPB) LR 90 Deg. Ell. (C-431A) X1, X2, X3, X4, X5, X6 (Item 1-248) |                    |              |               |                   |     |      |      |      |    |    |    |    |  |  |  |  |
| 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 |  |  |  |  |
| A223 Grade B   |  | (237351)<br>(CVAL 9)  | 72,900  | 38,100             | 42.0         |               | .21               | .88 | .009 | .014 | .190 |    |    |    |    |  |  |  |  |

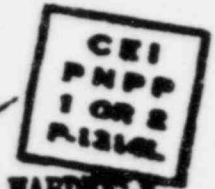
PULLY KILLING  
 CENTER APPROVED  
 7/5/77 BY [Signature]  
 11-1-77

Ultrasonic Test - Pipe was ultrasonic tested per Crane procedure UF-3 Rev. 2 (MK) and found acceptable.  
 Heat Treatment - Not required final forming operation completed at a temperature above 1150 Deg. F. & below 1800 Deg. F. (SA223 Para. 6.1.1.)  
 Magnetic Particle - 100% of the fitting was magnetic particles tested per Crane procedure MF-3 Rev. 3 and found acceptable.  
 Ultrasonic Test - Fitting was ultrasonic tested per Crane procedure UF-3 Rev. 2 (MK) and found acceptable.  
 Impact Test - Charpy "V" Notch, Full Size at plus 30 Deg. F. - Longitudinal

| Ft. Lbs. | Shear |
|----------|-------|
| 110      | 90%   |
| 110      | 90%   |
| 122      | 90%   |

Lat. Exp.  
 78 Mills  
 81 Mills

THE 70 MILS AL CERTIFIED TO  
 12/14 ASME CODE.  
 2/75 ASME SECTION II  
 WITH MILLION  
 QUALITY CONTROL DEPARTMENT



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

8405-108  
 13468307

12221032

20. 11022  
8-105-12.7

|                                  |                       |   |                        |
|----------------------------------|-----------------------|---|------------------------|
| DATE: 4-25-77                    | DATE SHIPPED: 4-22-77 | MILL ORDER NO. T-3072-A2-10-20  | SHIPPING LIST NO. 115C |
| Standard Pipe & Supply Co., Inc. |                       | CUSTOMER ORDER NO. 9716   |                        |
|                                  |                       | CAR NO. PC 525801   |                        |
|                                  |                       | MATERIAL: SEAMLESS <input checked="" type="checkbox"/> PIPE <input type="checkbox"/> TUBE, HOT FINISHED |                        |
| Pullman Kellogg Co.              |                       | SPECIFICATION: ASME SA-106-B (O.H.)   |                        |

| NO. PCS. | OD      | WALL    | LENGTH | TOTAL WT. | TOTAL IN. | NET WT. |
|----------|---------|---------|--------|-----------|-----------|---------|
|          | 12.750" | x .844" |        |           |           |         |

CEI  
 PNPP  
 1 OR 2  
 P-1314L

57529

INFORMATION ONLY

|                 |       |        |        |        |        |     |     |     |     |
|-----------------|-------|--------|--------|--------|--------|-----|-----|-----|-----|
| MEAT. NO. 57529 | C .25 | Mn .74 | P .011 | S .022 | Si .21 | Cu. | Ni. | Cr. | Mo. |
|-----------------|-------|--------|--------|--------|--------|-----|-----|-----|-----|

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]

RECEIVED  
 MAY 6 1977  
 QUALITY CONTR.

|                        |   |   |            |            |    |                 |      |    |    |    |    |    |
|------------------------|---|---|------------|------------|----|-----------------|------|----|----|----|----|----|
| JOINTY DISTANCE - 16TH |   |   | ROCKWELL C | FLATTENING | OK | HYDROSTATIC PSI | 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



402/1399

APPROVED FOR PRODUCTION

Code see 1748, Subseries M-2741 and M-2742 at Summary 1876 Addenda, and Appendix 1, Tables 1 to 11 and 1 13.3 of Volume 1877 Addenda apply as permitted by SP-125 and Paragraph M-1140771

PENE. N<sup>o</sup> 1 P121 P414  
Unit # 2 P410 P112

ASSEMBLY DWG NO. 70195Y-D35.1  
SIZE CAT NO. P410P112

# TUBE TURNS

## BELLOWS EXPANSION JOINT

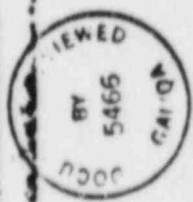
PLANT CODE: 70195Y  
ITEM NO. 13734

| ITEM NO. | QUANTITY | DETAIL (PART NO.) | UNIT | FINISHED DIMENSIONS | REMARKS | ITEM NO. | PLANT CODE | ITEM NO. | DESCRIPTION | CONSTRUCTION |
|----------|----------|-------------------|------|---------------------|---------|----------|------------|----------|-------------|--------------|
| 1        | 3        | SA 105            | 3    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 2        | 3        | SA 306            | 3    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 3        | 1        | C. 6              | 1    | SEE DWG             | SEE DWG | C. 6     | 70195Y     | PN 397   | C. 6        | C. 6         |
| 4        | 2        | SA 105            | 2    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 5        | 1        | C. 6              | 1    | SEE DWG             | SEE DWG | C. 6     | 70195Y     | PN 397   | C. 6        | C. 6         |
| 6        | 3        | C. 5              | 3    | SEE DWG             | SEE DWG | C. 5     | 70195Y     | PN 397   | C. 5        | C. 5         |
| 7        | 1        | SA 100            | 1    | SEE DWG             | SEE DWG | SA 100   | 70195Y     | PN 494   | SA 100      | SA 100       |
| 8        | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 9        | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 10       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 11       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 12       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 13       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 14       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 15       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 16       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 17       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 18       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 19       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 20       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 21       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 22       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 23       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 24       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 25       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 26       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 27       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 28       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 29       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 30       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 31       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 32       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 33       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 34       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 35       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 36       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 37       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 38       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 39       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 40       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 41       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 42       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 43       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 44       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 45       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 46       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 47       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 48       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |
| 49       | 1        | SA 105            | 1    | SEE DWG             | SEE DWG | SA 105   | 70195Y     | PN 494   | SA 105      | SA 105       |
| 50       | 1        | SA 306            | 1    | SEE DWG             | SEE DWG | SA 306   | 70195Y     | PN 497   | SA 306      | SA 306       |

70195Y-D35.1

Type Q

70195Y-D35.1



b(3,4)

INDEX TO SECTION I

405/380

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

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| FK778                 | E59                     |
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| F1314                 | E102                    |
| 842253                | E103                    |
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| 71496                 | E112                    |
| 70512                 | E113                    |



D Louisville, Kentucky 40201  
 Tube Turns  
 718 South 28th St.  
 Gate #1  
 Louisville, Kentucky 40211

TUBE TURNS  
 ORDER NO. HMF 4 94487

CUSTOMER  
 ORDER NO. 94487

| DESCRIPTION  | PHYSICALS<br>OF MATERIALS FROM WHICH MADE |                                  |   |                                  |                           | CHEMICAL ANALYSIS   |     |      |      |     |     |    |    | HEAT<br>OR<br>LOT<br>NO. | SPECIFIC<br>TOLERANCE<br>FOR<br>MATERIAL<br>FROM WHICH<br>MADE |        |
|--|---|----------------------------------|---|----------------------------------|---------------------------|---|-----|------|------|-----|-----|----|----|--------------------------|--|--------|
|  | 3/8<br>HEAT<br>TREAT-<br>MENT             | WELD POINT<br>PER SQUARE<br>INCH | TENSILE<br>STRENGTH<br>PER SQUARE<br>INCH | YIELD<br>STRENGTH<br>PER<br>INCH | ELONGATION<br>PER<br>INCH | C   | MN  | P    | S    | SI  | CR  | NI | MO |                          |  | CB     |
| Item 001 2 Pieces<br>12.25 Max. 21.686 Min.<br>32.062 Min. O.D. x 21.814 Max.<br>x 7.600 - .062" Flued Heads<br>Complete per Dwg. 70195Y-<br>D33.1 Rev. 1    | 3   | 48,700                           | 74,800                                    | 32.7                             | 63.2                      | .25   | .70 | .011 | .022 | .18 | .04 |    |    |                          | 6010319  | SA-105 |
|  |   |                                  |   |                                  |                           | Charpy "V" Notch @ -0°F. 82-102-64 Ft. Lbs./59-72-50 Mile L.E./60-60-60% Shear    |     |      |      |     |     |    |    |                          |  |        |
|  |   |                                  |   |                                  |                           | Ultrasonic Inspection tested per TT 04-037 Rev. 1 Add. 2                          |     |      |      |     |     |    |    |                          |  |        |
|  |   |                                  |   |                                  |                           | TAG: 1 Pc. P.O. 70195Y Item 33, Code L  |     |      |      |     |     |    |    |                          |  |        |
|  |   |                                  |   |                                  |                           | 1 Pc. P.O. 70195Y Item 37, Code L   |     |      |      |     |     |    |    |                          |  |        |
| Item 002 2 Pieces<br>32.25 Max. 21.686 Min.<br>32.062 Min. O.D. x 21.814 Max.<br>x 7.600 - .062" Lg. Flued<br>Heads complete per Dwg.<br>70195Y-D33.1 Rev. 1 | 3   | 50,900                           | 84,900                                    | 29.6                             | 60.1                      | .29   | .96 | .008 | .032 | .18 |     |    |    |                          | 6076104  | SA-105 |
|  |   |                                  |   |                                  |                           | Charpy "V" Notch @ -0°F. 154-82-170 Ft. Lbs./62-56-79 Mile L.E./100-80-100% Shear |     |      |      |     |     |    |    |                          |  |        |
|  |   |                                  |   |                                  |                           | Ultrasonic Inspection tested per TT 04-037 Rev. 1 Add. 2                          |     |      |      |     |     |    |    |                          |  |        |
|  |   |                                  |   |                                  |                           | TAG: 1 Pc. P.O. 70195Y Item 41, Code L  |     |      |      |     |     |    |    |                          |  |        |
|  |   |                                  |   |                                  |                           | 1 Pc. P.O. 70195Y Item 45, Code L   |     |      |      |     |     |    |    |                          |  |        |



THIS MATERIAL RECEIVED AS COMPLYING WITH THE SPECIFICATION  
 COMPLIANCE WITH ASTM 300 IS BASED ON  
 LICSC REPORT OF 7-31-77  
 THIS MATERIAL IS NOT IN COMPLIANCE  
 TUBE TURNS  
 BY *[Signature]* DATE 20-31-77

\* STANDARD ROUND TEST SPECIMEN: 1 NORMALIZED 2 ANNEALED 3 HEAT TREATED PER ORDER SPECIFICATION.  
 SUBSCRIBED AND SWORN TO BEFORE ME THIS  
 28th DAY OF October 19 77

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

*[Signature]*  
 NOTARY PUBLIC

Metrow Tube Turn  
 My Commission Expires...

*[Signature]*  
 R. Avera, Quality Control Dept.



b(3)-1

LO Box 987  
 Louisville, Kentucky 40201  
 S Tube Turns  
 HT 718 So. 28th St.  
 IO Gate #1  
 P Louisville, Kentucky 40211

DIVISION OF STEEL CORPORATION  
 DIVISION OF STEEL CORPORATION

TIME TURNED  
 ORDER NO. **HF 4 9/283**  
 CUSTOMER'S  
 ORDER NO. **94483**

| DESCRIPTION   | PHYSICALS<br>OF MATERIALS FROM WHICH MADE |  |                               |  |   | CHEMICAL ANALYSIS   |     |      |      |     |     |    | HEAT<br>OR<br>LOT<br>NO. | SPECIES<br>THIS IS<br>MATERIAL<br>FORM WHICH IS<br>MADE |         |        |
|---|---|--|-------------------------------|--|---|---|-----|------|------|-----|-----|----|--------------------------|---|---------|--------|
|   | U.S.<br>HEAT<br>TREAT-<br>MENT            | TENSILE<br>STRENGTH<br>PER INCH<br>DIAM. | ELONGATE<br>PER INCH<br>DIAM. | YIELD<br>STRENGTH<br>PER INCH<br>DIAM. | HARDEN-<br>ING<br>TEMPER-<br>ATURE<br>PER INCH<br>DIAM. | C   | MN  | P    | S    | SI  | CR  | NI |                          |   | MO      | CB     |
| Item 001 16 Pieces<br>40.968 Min.<br>41.031 Max. I.D. Containment | 3   | 48,700                                   | 74,800                        | 33.7                                   | 63.2  | .25   | .70 | .011 | .022 | .18 | .04 |    |                          |   | 6010319 | SA-105 |
| Forging complete per Dwg.<br>70195Y-B1.5, Rev. 1                  |   |  |                               |  |   | Charpy "V" @ O.F. (10mm x 10mm) 82-102-64 Ft. Lbs./59-72-50 Mills .E./60-60-60% Shear<br>Ultrasonic tested per TT 04-087 Rev. 1 Add. 2 - Satisfactory |     |      |      |     |     |    |                          |   |         |        |

THIS MATERIAL ACCEPTED AS COMPLYING WITH THE SPECIFICATION  
 COMPLIANCE TESTS PERFORMED BASED ON [unclear] 9-28-77  
 [unclear]  
 TUBE TURNS  
 BY EA VAD DATE 10-21-79



\* STANDARD POUND TEST SPECIMEN 1-1 NORMALIZED 2-ANNEALED 3-HEAT TREATED PER ORDER SPECIFICATION.  
 I HEREBY CERTIFY THIS REPORT TO BE TRUE AND CORRECT ACCORDING TO RECORDS IN THE POSSESSION OF THIS CORPORATION  
 SUBSCRIBED AND SWORN TO BEFORE ME THIS 23rd DAY OF November 1977

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

R. C. Campbell, C. C. Per. [unclear]  
 J. J. Wheeler  
 116.1978

b(3)-2

Louisville, Kentucky 40201  
 Tube Name  
 718 South 28th St.  
 Gate #1  
 Louisville, Kentucky 40211

DIVISION OF TEXAS METAL INDUSTRIES

REPORT NO. TEXAS 11/2 bh  
 TUBE TURNS ORDER NO. #MF 4 93173  
 CUSTOMER'S ORDER NO. 93178

Replaces DAR dated 10/13/77

| DESCRIPTION   | PHYSICALS OF MATERIALS FROM WHICH MADE |                             |  |                          |                           | CHEMICAL ANALYSIS |      |      |      |     |    |    |    |    |  | HEAT OR LOT NO. | SPECIFY TYPE OF MATERIAL FROM WHICH MADE |
|---|--|-----------------------------|--|--------------------------|---------------------------|-------------------|------|------|------|-----|----|----|----|----|--|-----------------|--|
|   | STANDARD TREATMENT                     | YIELD POINT PER SQUARE INCH | TENSILE STRENGTH PER SQUARE INCH                         | PERCENT ELONGATION IN 2" | PERCENT REDUCTION IN AREA | C                 | MN   | P    | S    | SI  | CR | NI | MO | CB |  |                 |  |
| Item 001 2 Pieces<br>32.25 Max. +031<br>32.125 Min. I.D. x 2.250 -062 | 3                                      | 51,700                      | 78,400   | 29.0                     |                           | .22               | 1.01 | .010 | .017 | .22 |    |    |    |    |  | 59102           | SA516 Gr. 70                             |
| x 48.187 Max. Anchor Plates   |  | TAG:                        | 1 Pc.  | P.O. 70195               | Item 33, Code M           |                   |      |      |      |     |    |    |    |    |  |                 |  |
| Machine Complete per Tube   |  |                             | 1 Pc.  | P.O. 70195               | Item 37, Code M           |                   |      |      |      |     |    |    |    |    |  |                 |  |
| Turns Diag. #70195-D33.1, Rev.  |  |                             |  |                          |                           |                   |      |      |      |     |    |    |    |    |  |                 |  |
| 1 Spec. CS-P-106 Rev. 1   |  |                             |  |                          |                           |                   |      |      |      |     |    |    |    |    |  |                 |  |
| Item 002 2 Pieces<br>32.25 Max. +031<br>32.125 Min. I.D. x 2.250 -062 | 3                                      | 51,700                      | 78,400   | 29.0                     |                           | .22               | 1.01 | .010 | .017 | .22 |    |    |    |    |  | 59102           | SA516 Gr. 70                             |
| x 48.187 Max. Anchor Plates   |  | TAG:                        | 1 Pc.  | P.O. 70195               | Item 41, Code M           |                   |      |      |      |     |    |    |    |    |  |                 |  |
| Machine Complete per Tube   |  |                             | 1 Pc.  | P.O. 70195               | Item 45, Code M           |                   |      |      |      |     |    |    |    |    |  |                 |  |
| Turns Diag. #70195-D33.1, Rev.  |  |                             |  |                          |                           |                   |      |      |      |     |    |    |    |    |  |                 |  |
| 1 Component Spec. CS-P-106<br>Rev. 1                                  |  |                             |  |                          |                           |                   |      |      |      |     |    |    |    |    |  |                 |  |
|   |  |                             | Charpy "V" Notch @ 0°F.                                  |                          |                           |                   |      |      |      |     |    |    |    |    |  |                 |  |
|   |  |                             | 78-104-85 Ft. lbs./61-71-68 Mills L. E. 70-100-80% Shear |                          |                           |                   |      |      |      |     |    |    |    |    |  |                 |  |



THIS MATERIAL ACCEPTED AS COMPLYING WITH THE SPECIFICATION  
 COMPLIANCE IS BASED ON  
 [ ] CERTIFICATE OF ANALYSIS OF 1-25-77  
 NONE OF THE ABOVE APPLIES  
**TUBE TURNS**  
 BY SRV DATE 10-31-77

\* STANDARD ROUND TEST SPECIMEN \*\* 1 - NORMALIZED 2 - ANNEALED 3 HEAT TREATED PER ORDER SPECIFICATION.  
 SUBSCRIBED AND SWORN TO BEFORE ME THIS  
 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

*[Signature]*  
 NOTARY PUBLIC

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

*[Signature]*  
 R. C. Campbell, U. C. Rep.



1-(7)

L O J. BOX 34100  
 D Andersonville, Kentucky 48232

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

Replaces DAR dated 10/7/77

PROCESSED, TRADE MARK  
 TUBE TURNS  
 ORDER NO. 4 93182  
 CUSTOMER'S  
 ORDER NO. 92182

| DESCRIPTION   | PHYSICALS |        | CHEMICAL ANALYSIS  |                    |                    |                    |                    |                    |                    |                    |                    |                    | MATERIAL FROM WHICH MADE | MAY OR LOT NO.     | MATERIAL FROM WHICH MADE |                    |                    |
|---|-----------|--------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------------|--------------------|--------------------------|--------------------|--------------------|
|   | Q & Q     | Q & Q  | C                  | MN                 | P                  | S                  | SI                 | CR                 | NI                 | MO                 | CB                 |                    |                          |                    |                          |                    |                    |
| Item 001 2 Pieces<br>32.250 Max<br>32.175 Min. I.D. x 2.000<br>+0.031<br>-0.062 x 40.000 + .125 O.D.<br>Anchor Plates Machine com-<br>plete per Tube Turns Diag.<br>70195Y-D49.1 Rev. 1 | 3         | 51,700 | 78,400             | 29.0               | .22                | 1.01               | .010               | .017               | .22                |                    |                    |                    |                          |                    |                          | 59102              | SA516 Cr. 70       |
|   |           | TAG:   | 1 Pc.              | P.O. 70195         | Item 49 Code N     |                    |                    |                    |                    |                    |                    |                    |                          |                    |                          |                    |                    |
|   |           |        | 1 Pc.              | P.O. 70195         | Item 53 Code N     |                    |                    |                    |                    |                    |                    |                    |                          |                    |                          |                    |                    |
|   |           | Charpy | 'V' Notch @ 0 F.   |                    |                    |                    |                    |                    |                    |                    |                    |                    |                          |                    |                          |                    |                    |
|   |           |        | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs.       | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs.       | 78-104-85 Ft. lbs. | 78-104-85 Ft. lbs. |

THIS MATERIAL ACCEPTED AS COMPLYING WITH THE SPECIFICATION  
 COMPLIANCE Y... .. IS BASED ON [ ] C/C AT A UNIT OF 1-35-77  
 REFERENCE TO 2410 IN 2410S  
 BY *Shirley* DATE 10-1-78



STANDARD ROUND TEST SPECIMEN # 1 NORMALIZED 2-ANNEALED 3-HEAT TREATED PER ORDER SPECIFICATION.  
 I HEREBY CERTIFY THIS REPORT TO BE TRUE AND CORRECT  
 ACCORDING TO RECORDS IN THE POSSESSION OF THIS CORPORATION



R. C. Campbell, Q. C. Notary

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

23rd DAY OF November 19 77

*W. C. ...*  
 NOTARY PUBLIC

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   |
|---------------------|--------------------|--------------|-----------|
| <b>(a) Castings</b> |                    |              |           |
| Body<br>RT# N2128   | SA216 WCB          | Quaker Alloy | S/N 5-560 |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |
| <b>(b) Forgings</b> |                    |              |           |
| Poppet              | SA350 Gr. LF-2     | Cann & Saul  | S/N 1-560 |
| Cover               | SA105 (QT)         | Cann. & Saul | S/N 1-560 |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |
|                     |                    |              |           |

\*Supplemental sheets in form of lists, sketches, drawings may be used provided (1) size is 8 1/2" x 11", (2) information is: Items, 1, 2, 5a and

677/593

dcw

FORM NPV-1 (back)

| Mark No.  | Material Spec. No.       | Manufacturer      | Remarks      |
|---|--------------------------|-------------------|--------------|
| (c) Bolting   |                          |                   |              |
| Cover Studs (18)  | SA540 Gr. B23<br>Class 5 | Jos. Dyson & Sons | Heat# 114188 |
| Cover Nuts (18)   | SA540 Gr. B23<br>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 Poppet  
2175 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 (I) Prof. Eng. State Calif. Reg. No. 16371  
 Stress analysis report certified by Herbert Cook (I) Prof. Eng. State Mass. Reg. No. 10981  
 (I) 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 SIOP 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  |
|---|----------------|---------|----------|-------------|---|
| <b>GENERAL</b>  |                |         |          |             |   |
| G.E. Product Quality Certification<br>Manufacturers Data Report (NPV-1)<br>Vendors Cert. for Qualified NDE &<br>Weld Personnel<br>A&M Cert. for Qualified NDE &<br>Weld Personnel<br>Customer Certified Design Spec.<br>A&M Certified Stress Report<br>Certified "As Constructed" Dwg.<br>Approved DDR's  | N/A            |         |          |             | x<br>x<br>x<br>x<br>No<br>No<br>No<br>No            |
| <b>BODY</b>   |                |         |          |             |   |
| CMTR with Heat Treat Charpy Data<br>R.T. Reader Sheets w/shooting sketch<br>M.T. as cast at foundry<br>Repair Data (Charts, P.W.H.T. etc.)<br>M.T. Finished Mach. Surfaces & Cert.<br>P.T. Seat Overlay w/Weld Record & Cert.<br>P.T. Riba. Overlay, w/Weld Record & Cert.<br>P.T. Weld Ends after Final Mach.<br>Min. Wall Dimensional Report<br>Weld Rod CMTR<br>Visual Examination (See Final Insp.<br>Data Sheet) | 5-560          | N2128   | F6944    |             | x<br>x<br>x<br>x<br>x<br>x<br>x<br>x<br>x<br>x<br>x |
| POPPET  | 1-560          | N/A     | 632225   |             | x<br>x<br>x<br>x<br>x                               |
| CMTR with Heat Treat & Charpy Data<br>Ultrasonic Test Report<br>M.T. Final Mach. Surfaces & Cert.<br>P.T. Overlays w/Weld Record & Cert.<br>Min. Wall Dimensional Report<br>Weld Rod CMTR   |                |         |          |             | x<br>x<br>x<br>x<br>x                               |


CEI QUALITY ASSURANCE  
 REVIEWED HGB  
 DATE 11-18-76  
 PNPP

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

*Wade 6/76*

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

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

A&M *[Signature]* 2/23/76 Auth. Insp. *[Signature]* 2-23-76 Cust. Rep. *[Signature]* 2-24-76  
  
 d(1)-4



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

S/N 5-560

13560  
BODY 26"

**MATERIAL TEST REPORT**

205AF774

| CUSTOMER ORDER NO | PATTERN NO      | QUAKER ALLOY DESIGNATION | SPECIFICATION          | SHOP ORDER NUMBER | DATE SHIPPED |
|-------------------|-----------------|--------------------------|------------------------|-------------------|--------------|
| AM25336           | 16731-30147-102 | Q70                      | ASME SA216 GR.WCB (74) |                   | 1-16-76      |

CUSTOMER

Atwood and Morrill

**APPROVED**  
BY *R. J. ...*  
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.# | R.#   | PC SHIP |  |
|---------|-----|-----|---------------------------------|------|------|----|----|----|--------------|----------------|--------------------|----------------|-------------|-------|---------|--|
| F6944   | .25 | .68 | .47                             | .013 | .018 |    |    |    | 46,000       | 84,000         | 32.0               | 50.7           | F6944-3     | 12128 |         |  |
|         |     |     | Charpy Impact V Notch Plus 60°F |      |      |    |    |    | 34-37-37     |                | foot.pounds        |                |             |       |         |  |
|         |     |     |                                 |      |      |    |    |    | 34-36-37     |                | lateral expansion  |                |             |       |         |  |
|         |     |     |                                 |      |      |    |    |    | 30-30-30     |                | % Ductile Fracture |                |             |       |         |  |

REMARKS

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

CHEMICAL & PHYSICAL  
REPORT CHECKED



*1-14-76*

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



*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*

5-(1)P

# CANN & SAUL STEEL CO.

*Sp. 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**

## 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 % |      |
|----------------------------|--------------------------|-------|----------------|--------------------------|---------------|--------------------------------|---------|------------------------------------|-------------|------|
| <b>FORGINGS</b><br>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 73 25              | 55 73 72 25   | Mils Lateral expansion @ +60°F |         | CHEMICAL & PHYSICAL REPORT CHECKED |             |      |

Heat Treat to C&S Proc. #66 (A-14-75)

## OTHER TESTS

Sonic C&S Proc. A388, 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 or subcontractors are in compliance with the requirements of the materials specification and the ASME Code, Sec. III 1974 Edition.

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

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

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. Ciampa Date: 12-2-75  
R. E. Ciampa, Quality Control Representative  
General Electric Co. - Power Products Dept.  
CANN & SAUL STEEL CO.

G.E. & A&M

*[Signature]*

**APPROVED**  
DATE 11-14-75

*[Signature]*

d(11)-6

# CANN & SAUL STEEL CO.

*AM S/N 1 Thru 4-5*

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.  
 Address 2 85 Canal St.  
 Salem, Mass. 01970

AM-25353  
 Ref. #13560-01 COVER 34062

Attention Purchasing Dept.

## CHEMICAL COMPOSITIONS

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

## 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. |
|--------------------------|-------------|-------|----------------|--------------------------------|---------------|-----------------------|---------|--------------|-------------|--------|
| Forging                  | 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

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

T. 70,000

E. 22%

B.H.N. 187 Max.

R. 30%

DATE 12/1/76  
 ATWOOD & MORRILL CO. INC.

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: [Signature] In-charge of  
 R. E. Ciampa, Quality Control Representative  
 General Electric Co. - BWR Projects Dept.

Inspector



CANN & SAUL STEEL CO.

[Signature]  
 Eng. of Tests

JOE. 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                    | CHEMICAL & PHYSICAL<br>REPORT CHECKED<br>BY <u>St. Sharp</u><br>DATE <u>1/16/76</u><br>ATWOOD & MORRILL CO. INC. |
|      | 68      | 50      | .048                    |  |
|      | 68      | 50      | .048                    |  |
| Ave. | 68      |         |                         |  |
|      | 74      | 60      | .052                    |  |
|      | 75      | 60      | .053                    |  |
|      | 74      | 60      | .053                    |  |
| 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. Clampa, Quality Control Representative  
General Electric Co. - DWR Projects Dept.

AI 1-16-76  
for 123 studs

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

STUDS

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

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 Mazzearella-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.

CORRECTED TEST REPORTS 1-16-76

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

ITEM 2

197 Pcs. Hex Nuts for 26" and 28" Main Steam Isolation Valves  
 1-13-76 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:

| TENSILE | YIELD   | ELONG | RED  | RC HARDNESS |
|---------|---------|-------|------|-------------|
| 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.

| FT/LBS.   | % SHEAR | LAT. EXPANSION (IN.) |
|-----------|---------|----------------------|
| 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-2333

HEAT 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 6-12-75

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

-CONTINUED-

APPROVED  
 BY: *[Signature]*  
 DATE: 1-20-76  
 ATWOOD & MORRILL CO. INC.

D - 1-20-76

A.I. for 197 pieces  
 for 13560-01102.



JOS. DYSON AND SONS, INC. CERTIFIED TEST REPORT

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

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

CORRECTED TEST REPORTS 1-16-76

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 Mazarella  
Quality Assurance Manager/  
Ralph McKinney

Reviewed By: *REC* Date: *1/20/76*  
R. E. Ciarra, 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.,<br>Series No.<br>or Type | (b) N Certificate Holder's<br>Serial<br>No. | (c) Canadian<br>Registration<br>No. | (d) Drawing<br>No. | (e) Class | (f) Nat'l.<br>Bd. No. | (g) Year<br>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 |
|---------------------|--------------------|----------------|---------|
| <b>(a) Castings</b> |                    |                |         |
| 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>(b) Forgings</b> |                    |                |         |
| 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        | Tubesales     |         |
| 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 [Signature]  
(N Certificate Holder)  
 Our ASME Certificate of Authorization No. N-1254 to use the N symbol expires 10/27/81.  
(N) (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 1979, 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 1979 Commissions 1275-CA. OHIO 1/25/78  
(Inspector) (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-Che Jutsu Higata Pref, Japan.

# N

HEAT NO. 85134  
N CODE NO. 3V02  
S/O \_\_\_\_\_  
P.O. \_\_\_\_\_  
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 % |      |      |       |       |      |      |      | Sulfur V |      |
|-----------------|----------|--|----------------------------|----------------------------|------------|-----------|---------------|-----------|-------------|----------------------------|------|------|-------|-------|------|------|------|----------|------|
|                 |          |  | Yield Strength             | Tensile Strength           | Elongation | Reduction |               |           |             | C                          | Si   | Mn   | P     | S     | W    | Cr   | Mo   |          | Cu   |
|                 |          |  | kgf/mm <sup>2</sup><br>Psi | kgf/mm <sup>2</sup><br>Psi | %          | %         |               |           |             | MAX.                       | MAX. | MAX. | MAX.  | MAX.  | MAX. | MAX. | MAX. |          | MAX. |
| Standard        |          |  | min. 36,000                | 70,000                     | min. 22    | min. 35   |               |           |             | 0.30                       | 0.60 | 1.00 | 0.040 | 0.045 | 0.50 | 0.50 | 0.25 | 0.50     | 0.03 |
| 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



*K. Nishiyama*  
Manager of Quality Assurance

DATE 3/14/79

d(2)-3



# PACIFIC METALS CO., LTD.

Nuclear Valve Division  
SSRS IORIG - WARNER CORPORATION

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

HEAT NO. 85135  
N CODE NO. 3Y12  
S/O \_\_\_\_\_  
P.O. 14103  
QTY. 6  
INSP DATE 3-16-79  
VENDOR GEO CHIANG

Gate Valve Body  
ME OF ARTICLES Gate Valve Bonnet

Date Dec. 8, 1978

AWING No. \_\_\_\_\_  
**INSPECTION CERTIFICATE**

Inspection No. 78 - 196

ECIFICATION ASME SA216 Gr. WCB

Order No. \_\_\_\_\_

| Lot<br>No. | Quantity |                  | Tensile Test              |                           |            |            | Hardness<br>Test | Red<br>Test | Impact<br>Test | Chemical Composition in % |              |              |               |               |              |              |              | Sulfur<br>V  |              |
|------------|----------|------------------|---------------------------|---------------------------|------------|------------|------------------|-------------|----------------|---------------------------|--------------|--------------|---------------|---------------|--------------|--------------|--------------|--------------|--------------|
|            | Number   | Weight<br>in lbs | Tensile<br>Strength       | Tensile<br>Strength       | Elongation | Reduction  |                  |             |                | C                         | Si           | Mn           | P             | S             | Ni           | Cr           | Mo           |              | Cu           |
|            |          |                  | kg/cm <sup>2</sup><br>Psi | kg/cm <sup>2</sup><br>Psi | %          | %          |                  |             |                |                           |              |              |               |               |              |              |              |              |              |
|            |          |                  | min.<br>36,000            | 70,000                    | min.<br>22 | min.<br>35 |                  |             |                | MAX.<br>0.30              | MAX.<br>0.60 | MAX.<br>1.00 | MAX.<br>0.040 | MAX.<br>0.045 | MAX.<br>0.50 | MAX.<br>0.50 | MAX.<br>0.25 | MAX.<br>0.50 | MAX.<br>0.05 |
| 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 - 168    | 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.

4(2)-4

Surveyor

REVIEWED BY  
AUTHORIZED  
INSPECTOR



*K. Nishiyama*  
Manager of Quality Assurance

3/19/79



# PACIFIC METALS CO., LTD.

Nuclear Valve Division  
MESSRS. DORC - WARNER CORPORATION

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

HEAT NO. 85131  
N CODE NO. 3V14  
S/O \_\_\_\_\_  
P.O. \_\_\_\_\_  
QTY. 5  
DATE 3-16-78  
VENDOR Geo CHIANG

# N

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 % |           |           |            |            |           |           |           | Observation |           |           |  |
|-----------------|----------|---------------|---------------------------|---------------------------|------------|-----------|---------------|-----------|--------------------------------|---------------------------|-----------|-----------|------------|------------|-----------|-----------|-----------|-------------|-----------|-----------|--|
|                 |          |               | Yield Strength            | Tensile Strength          | Elongation | Reduction |               |           |                                | C                         | Si        | Mn        | P          | S          | Ni        | Cr        | Mo        |             | Cu        |           |  |
|                 |          |               | kg/mm <sup>2</sup><br>Psi | kg/mm <sup>2</sup><br>Psi | %          | %         |               |           |                                |                           |           |           |            |            |           |           |           |             |           |           |  |
| Standard        |          |               | min. 36,000               | 70,000                    | min. 22    | min. 35   |               |           | Charpy                         |                           |           |           |            |            |           |           |           |             |           |           |  |
|                 | Number   | Weight in kgs | kg/mm <sup>2</sup><br>Psi | kg/mm <sup>2</sup><br>Psi | %          | %         | HB            |           | kgm/cm <sup>2</sup><br>(notch) | 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. 0.25   | MAX. 0.03 | MAX. 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.       | 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.       | tr.       |  |

REVIEWED BY  
AUTHORIZED  
INSPECTOR

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

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. NAOETSU 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

*[Signature]*

DATE 07-3-78

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

**N**

### MECHANICAL PROPERTIES

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

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

*[Signature: Daniel Paul McGary]*

DANIEL PAUL MCGARY

09-14-78  
Date:

### 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.

*[Signature: Daniel Paul McGary]*



NUCLEAR

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

MP 19065 11

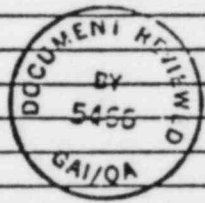
1. Manufactured by Rockwell International Corp., 1900 S. Saunders St., Raleigh, NC 27603  
(Name and Address of N Certificate Holder)  
 2. Manufactured for Cleveland Elec. Ill. Company, P.O. Box 500, Cleveland, Ohio 44101  
(Name and Address of Purchaser or Owner)  
 3. Location of installation Perry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

| (a) Model 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)                  |                                       |                               |                 |           |                    |                |

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

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

| Mark No.            | Material Spec. No. | Manufacturer                           | Remarks         |
|---------------------|--------------------|--|-----------------|
| <b>(a) Castings</b> |                    |  |                 |
| 4810433             | SA 216 Gr. WCC     | Rockwell Int'l<br>(Metal Casting Div.) | Body            |
|                     |                    |  |                 |
|                     |                    |  |                 |
|                     |                    |  |                 |
|                     |                    |  |                 |
|                     |                    |  |                 |
|                     |                    |  |                 |
|                     |                    |  |                 |
|                     |                    |  |                 |
| <b>(b) Forgings</b> |                    |  |                 |
| 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.

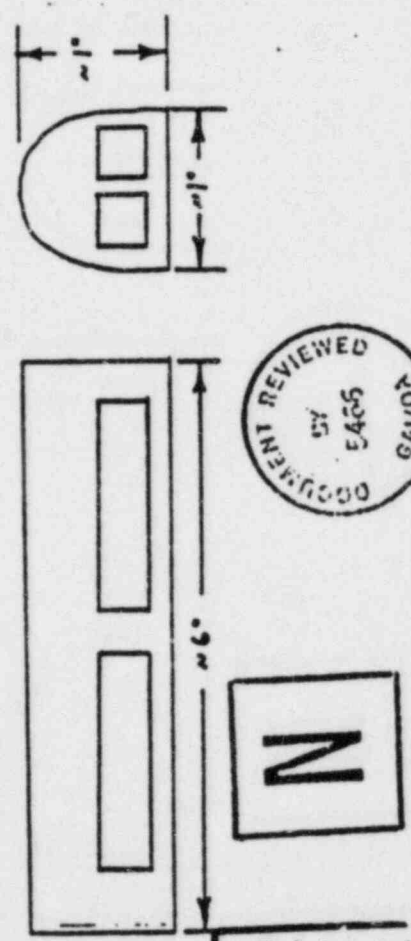
1811 F0032B

+2107 1210/926

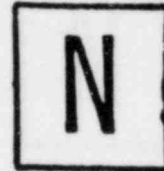


| HEAT NO.  | PATT. NO. | MO. PCS. | SRL NO. | ORDER NO. | SPEC.                              | YS PH   | TS PH | ELONG IN % | RED AREA % | MIN | CHEST IMPACT   |      | ANALYSIS |      |      |      |     |     |     |     |     |     |       |       |      |       |      |
|---|-----------|----------|---------|-----------|------------------------------------|---|-------|------------|------------|-----|--|------|----------|------|------|------|-----|-----|-----|-----|-----|-----|-------|-------|------|-------|------|
|   |           |          |         |           |                                    |   |       |            |            |     | 50.0   | 43.0 | C        | Mn   | Si   | C    | Ni  | Mo  | Co  | Al  | B   | V   | Zr    | Cu    |      |       |      |
| 4810433   | 126       | 1        | 120     | 70847     | ASME SA-216<br>BCC<br>MPC<br>01025 | 80000<br>11/111 1974 EDITION<br>WINTER 975 ADDENDUM, CODE 1 |       | 25.0       | 55.5       |     | 50.0   | 57.0 | .19      | 1.20 | 0.08 | .010 | .54 | .11 | .15 | .12 | .16 | .05 | .0005 | .0021 | .005 | .0006 | .010 |
| NOTE: TEST SPECIMEN RECEIVED & SOLVED VERY WELD HEAT TREATMENT AT 1100°F FOR 16 HOURS.<br>HEAT TREAT INFORMATION:<br>1300°F for 6 hours - Normalize<br>1250°F for 6 hours - Temper<br>ALL WELDS STRESS RELIEVED A MINIMUM OF ONE HOUR PER INCH OF THICKNESS WELD DEPOSIT - 50-100°F BELOW THE TEMPERING TEMPERATURE.<br>OPERATIONS NOT PERFORMED: T AND<br>A Final N.T. Inspection<br>B Final Stress Rel. etc |           |          |         |           |                                    |   |       |            |            |     | THIS MATERIAL WAS MANUFACTURED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION III, PARAGRAPH WQ.3.10.0.<br>WE HEREBY CERTIFY THAT THE HEAT TREAT AND METALLURGICAL DATA RELATIVE TO THE ANALYSIS AND PHYSICAL PROPERTIES OF THE MATERIAL DESCRIBED ARE TRUE AND ACCURATE.<br>MICHAEL J. WEAVER CHIEF OF METALLURGICAL SERVICES |      |          |      |      |      |     |     |     |     |     |     |       |       |      |       |      |

LOCATION AND ORIENTATION OF IMPACT SPECIMENS



ROCKWELL INTERNATIONAL  
 Customer: Cleveland Electric Illuminating Co  
 Rockwell S. O. No. 36-24401  
 Component: Body  
 Inspectability Code  
 APPROVED BY: P.C. Date: 10-7-81  
 Q. A. Representative: Date: 12-8-81  
 Authorized Inspector: [Signature]



TO

Rockwell Int.  
Raleigh, North Carolina 27603

Attn: John Gramack

ROCKWELL INTERNATIONAL  
Customer: Cleveland Electric Illuminating Co.  
Rockwell S. O. No. 312-24401  
Component: Case Traceability Code: NA  
APPROVED BY: P.C. [Signature] Date: 10-8-81  
Q. A. Representative: [Signature] Date: 10-8-81  
Authorized Inspector: [Signature] Date: 10-8-81

| CUSTOMER ORDER NO. | DATE SHIPPED | HEAT NO.    | SPECIFICATION-GRADE          |
|--------------------|--------------|-------------|------------------------------|
| 36-72242-C         | 9-30-81      | 116447      | EMC-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. NCA-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 |    |
| Ta  | Al   | Sn   | Fe   | Ti  | B  | Pb | W  |   |    |     |    |

MECHANICAL PROPERTIES

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

ULTRASONIC TEST RESULTS

JOMINY HARDENABILITY BY 1/16"

| GRAIN SIZE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 | 20 | 24 | 28 |
|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
|            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |

SUBSCRIBED AND SWORN TO BEFORE ME

THIS 30th DAY OF September, 1981

[Signature]  
NOTARY PUBLIC

CHARLES E. LARSON & SONS, INC.

[Signature]

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

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

As Required by the Provisions of the ASME Code Rules

676/1078

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 # IN176 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
6. Design Conditions 1512 psi 100 °F or Pressure Class 655# (1)  
(Pressure) (Temperature)
7. The material, design, construction, and workmanship complies with ASME Code Section III, Class X
- Edition 1971, Addenda Date Winter '73, Case No. 1567, 1637

| Mark No.                      | Material Spec. No. | Manufacturer   | Remarks      |
|-------------------------------|--------------------|----------------|--------------|
| <b>(a) Castings</b>           |                    |                |              |
| BODY HT. 6381E SH 2           | SA216 WCB          | ANCHOR/DARLING | VULCAN       |
| BONNET HT. 6667E SH 2         | SA216 WCB          | ANCHOR/DARLING | VULCAN       |
| DISC HT. 6595E SH 1G          | SA216 WCB          | ANCHOR/DARLING | VULCAN       |
| <b>(b) Forgings</b>           |                    |                |              |
| 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 6061), 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          |
|--------------------------|--------------------|----------------|------------------|
| <b>(c) Bolting</b>       |                    |                |                  |
| BONNET STUDS CODE 6C     | A193 B7            | ANCHOR/DARLING | RALPH KNUDTSEN   |
| BONNET NUTS CODE A9      | SA194-2H           | ANCHOR/DARLING | VITCO            |
|                          |                    |                |                  |
|                          |                    |                |                  |
| <b>(d) Other Parts</b>   |                    |                |                  |
| 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. (Manufacturer) by [Signature]  
 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 CALIFORNIA and employed by LUMBERMENS 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. Conall (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

MATERIAL SPECIFICATION: ASME SA-216 KCB

ASME Section III  
Winter 1973 Addenda

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      | Mechanical Properties               | Charpy Impact Test (V-Notch) |
|--------------------------|-------------------------------------|------------------------------|
| <u>.20</u> Carbon ✓      | <u>83,600</u> Tensile Strength, psi | Temperature <u>+10</u> °F    |
| <u>.96</u> Manganese ✓   | <u>62,500</u> Yield Point, psi      | <u>1</u>                     |
| <u>.16</u> Silicon ✓     | <u>31</u> Elongation (%)            | <u>53.1</u> Ft Lbs           |
| <u>.018</u> Phosphorus ✓ | <u>62.1</u> Reduction of Area (%)   | <u>95</u> Shear              |
| <u>.020</u> Sulfur ✓     |                                     | <u>.053</u> Expansion        |
| Nickel                   |                                     |                              |
| Chromium                 |                                     |                              |
| Molybdenum               |                                     | <u>2</u>                     |
| Columbium                |                                     | <u>59.9</u> Ft Lbs           |
| Copper                   |                                     | <u>95</u> Shear              |
|                          |                                     | <u>.050</u> Expansion        |
|                          |                                     | <u>3</u>                     |
|                          |                                     | <u>53.6</u> Ft Lbs           |
|                          |                                     | <u>95</u> Shear              |
|                          |                                     | <u>.050</u> Expansion        |



We hereby certify that this material meets all requirements of the material specification and all applicable special requirements of (Article 1.1 of the ASME Pump and Valve Code [Draft]) or (Article NB-2000 of the ASME Section III, Boiler and Pressure Vessel Code).

Temper Performed on Test Bars only.

10-21-75 (DATE) Daniel K. [Signature]  
QUALITY CONTROL MANAGER

# 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 CHIC675A

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

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

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

### PROC 1322-1 REV E

| Chemical Properties      | Mechanical Properties               | Charpy Impact Test (V-Notch) |
|--------------------------|-------------------------------------|------------------------------|
| <u>.22</u> Carbon ✓      | <u>75,800</u> Tensile Strength, psi | Temperature: <u>10</u> °F    |
| <u>.25</u> Manganese ✓   | <u>17,400</u> Yield Point, psi      | <u>87.1</u> Ft Lbs           |
| <u>.16</u> Silicon ✓     | <u>29.5</u> Elongation (%)          | <u>80</u> Shear              |
| <u>.019</u> Phosphorus ✓ | <u>51.4</u> Reduction of Area (%)   | <u>.076</u> Expansion        |
| <u>.027</u> Sulfur ✓     |                                     |                              |
| Nickel                   |                                     |                              |
| Chromium                 |                                     |                              |
| Molybdenum               |                                     |                              |
| Columbium                |                                     |                              |
| Copper                   |                                     |                              |
|                          |                                     | <u>2</u>                     |
|                          |                                     | <u>72.6</u> Ft Lbs           |
|                          |                                     | <u>80</u> Shear              |
|                          |                                     | <u>.076</u> Expansion        |
|                          |                                     |                              |
|                          |                                     | <u>3</u>                     |
|                          |                                     | <u>93.4</u> Ft Lbs           |
|                          |                                     | <u>80</u> Shear              |
|                          |                                     | <u>.076</u> 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 Part 1 and Code (Draft)) or (Article 113.2000 of the ASME Section III, Boiler and Pressure Vessel Code)

Test bars were tested and heat treatment performed on test bars only.

10-2-75 (DATE) *K. J. Eason* QUALITY CONTROL MANAGER

d(4)-4

# VULCAN STEEL FOUNDRY CO.

*Carbon and Alloy Steel Castings*

2909 CHAPMAN STREET • OAKLAND, CALIF. 94601  
PHONE (415) 261-5305

## MATERIAL TEST REPORT

DATE: 9-22-75

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

MATERIAL SPECIFICATION: ASME SA-216 WCB

ASME Section III  
Winter 1973 Addenda

HEAT NUMBER: 6595 E

PO/JOB NUMBER L076-5221-02 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 ANNEALED @ °F HRS MIN - WQ - DATE  
OTHER TEMPER 1150 6 DATE 9-25-75 . Q/T

1322-1 Rev E

### Chemical Properties

.19 Carbon  
.39 Manganese  
.42 Silicon  
.018 Phosphorus  
.027 Sulfur  
Nickel  
Chromium  
Molybdenum  
Columbium  
Copper

### Mechanical Properties

70,800 Tensile Strength, psi  
45,500 Yield Point, psi  
33 Elongation (%)  
63.5 Reduction of Area (%)

### Charpy Impact Test

(V-Notch)  
Temperature +110 °F  
1  
42.2 Ft Lbs  
15 Shear  
250 Expansion  
2  
40.5 Ft Lbs  
45 Shear  
21.7 Expansion  
3  
41.4 Ft Lbs  
45 Shear  
21.9 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 1.7 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.

10-20-75  
(DATE)

*Donald L. Gilman*  
QUALITY CONTROL MANAGER

d(4)-5



RALPH  NUDTSEN 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:



**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 **25113**

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  | 101 | 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 |
|       | 108 | 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 BECOMES PART OF THIS CERTIFICATE.

**THE TIMKEN COMPANY  
STEEL DIVISION**

*John J. ...*  
Authorized Signature

of Ohio  
County of Stark

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

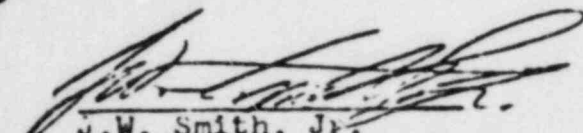
"CERTIFICATION"

Subject: PRESSURE BOUNDRY 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 36001ST EAST AVE., DPHO 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  
CHARPY BARS @+40°F.  
(FT. LBS)

LATERAL EXPANSION  
(IN.)

DUCTILE FRACTURE AREA  
(%)

72.0  
75.0  
72.5  
Average 73.0

.046  
.048  
.044

100  
100  
100



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 ABOVE AND DESCRIBED BEFORE ME.  
ON \_\_\_\_\_ DAY OF \_\_\_\_\_ BY A DULY  
QUALIFIED AGENT OF VITCO NUCLEAR PRODUCTS INC.

WE HEREBY CERTIFY THAT THE ABOVE DATA IS A TRUE COPY OF THE DATA FURNISHED US BY THE PRODUCING MILL OR SUPPLIER OF THE DATA RESULTING FROM TESTS PERFORMED IN ACCORDANCE WITH CODES AND ALL THE REQUIREMENTS OF THE SPECIFICATION LISTED.

VITCO NUCLEAR PRODUCTS INC  
BY [Signature]

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