The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

February 25, 1985
ST-HL-AE-1197
File Number: G9.17

Mr. Hugh L. Thompson, Jr. Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Thompson:

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Fracture Prevention of Containment Boundary (GDC-51)

As a result of a meeting between the NRC and HL&P on January 24, 1985, Houston Lighting & Power Company (HL&P) committed to provide an evaluation of the containment pressure boundary for fracture prevention in accordance with NRC General Design Criteria (GDC)-51. In response to that commitment, attached is the subject evaluation. Also attached are the CMTR's and Code Data Reports for the limiting items.

If you should have any questions concerning this submittal, please contact Mr. Michael E. Powell at (713) 993-1328.

Very truly yours,

M. R. Wisenburg
Manager, Nuclear Licensing

MEP/yd

Attachments: (1) Evaluation of Fracture Prevention of Containment Boundary
(2) CMTR's and Code Data Reports for Limiting Items

B001
1/1

W2/NRC1/aa

cc:

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Office of the Secretary
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Washington, DC 20555

SOUTH TEXAS PROJECT UNIT - 1 & 2

EVALUATION OF FRACTURE PREVENTION OF CONTAINMENT BOUNDARY

(GDC-51)

1. Lowest Service Metal Temperature (LSMT)

The lowest service metal temperature (LSMT) for the containment liner, including the equipment hatch, personnel airlock, auxiliary airlock and sleeves, is identified as +70°F during normal operation and maintenance.

2. Containment Pressure Boundary Materials

The materials of the containment pressure boundary reviewed within the context of GDC51 are the equipment hatch, personnel airlock and auxiliary airlock, sleeves, penetrations, piping and valves up to and including the first isolation valves. Limiting combinations of materials and heat treated conditions are described below and listed in the attached tables.

3. Equipment Hatch

The equipment hatch bolt flange, 6" thick SA516 Grade 70, quenched and tempered, is identified as a limiting item. The Summer 1977 (S77) Addenda of the ASME Code, Subsection NC assigns a T_{NDT} of -10°F. With the thickness correction per the Code Figure NC2311(a)-1, the resulting Permissible Lowest Service Metal Temperature (PLSMT) is +52°F.

The hatch shell, 3.5" thick SA537 Class 1, normalized, is identified as a limiting material. The ASME Code, S77 Addenda Table NC2311(a)1, assigns a T_{NDT} of -30°F; allowing for the thickness correction per the Code, Figure NC2311(a)-1, the resulting PLSMT is +17°F.

Insert Plate, 1" thick SA516 Grade 60, normalized is identified as a limiting material. The ASME Code, S77 Addenda, Table NC2311(a)1 assigns a T_{NDT} of 0°F and a PLSMT of +30°F.

4. Personnel Airlock

The Reactor End Shell Collar, 6" thick SA516 Grade 70, normalized is identified as a limiting material. The ASME Code, Subsection NC, assigns a T_{NDT} of 0°F. Allowing for a thickness correction in accordance with the Code Figure NC2311(a)-1, the PLSMT is 62°F.

5. Auxiliary Equipment Hatch

The collar piece 3" thick SA516 Grade 70, normalized is identified as a limiting material. The T_{NDT} based on the ASME Code, Table NC2311(a)-1 is 0°F. Correcting for the thickness in accordance with the Code, Subsection NC, S77 Addenda, the PLSMT is +40°F.

Boss, 3 7/8" SA350 LF2, quenched and tempered, is identified as a limiting material. NUREG 0577, Table 4.4 assigns an average value for this material in the normalized condition of -28°F. It is reasonable to

estimate a T_{NDT} for this material at or below -28°F in the quenched and tempered condition. Allowing for thickness correction in accordance with the ASME Code Subsection NC, S77 Addenda, the PLSMT is +22°F.

6. Penetration Sleeves

SA333 Grade 6, normalized, 1.031" thick is identified as a limiting material (Penetrations E23, E24). NUREG 0577 would categorize this material as a C-Mn steel with a T_{NDT} + 1.3 standard deviation value of -5°F. Allowing for thickness correction per the Code, S77 Addenda, Figure NC2311(a)-1 the PLSMT value is +25°F.

SA516 Grade 60, 2.5" thick, normalized is identified as a limiting material (penetrations M1 thru M4). Because the material was cold formed and stress relieved, an estimate of T_{NDT} is made. The Summer 1977 Addenda to the ASME Code, Subsection NC assigned a T_{NDT} of 0°F to the normalized plate.

According to the discussion on "Effects of Cold Work" in Welding Research Council Bulletin Number 158, January 1971, when this type of material is cold worked up to 5% and then stress relieved, its transition curve mid-height temperature increases 20°F. Based on the estimated strain for this forming of less than 5%, a conservative assumption of a 20° increase in T_{NDT} can be made. Based on a T_{NDT} of +20°F, and thickness correction in accordance with the ASME Code, Subsection NC (S77 Addenda) the PLSMT is +50°F.

SA106 Grade B, normalized, 0.968" thick is identified as a limiting material (Penetrations 20, 21, 22). NUREG 0577 Table 4.4 and Figure B7 would assign a T_{NDT} at or below + 40°F. Allowing for thickness in accordance with the ASME Code, Subsection NC, S77 Addenda, the PLSMT is +70°F.

7. Flued Head Penetrations

SA350 LF-2, quenched and tempered, with an axial thickness of 9 5/8" is a limiting material in flued head penetrations (main steam system, penetrations M1 through M4). The average T_{NDT} for this material in the normalized condition, per NUREG 0577, Table 4.4 is -28°F. It is reasonable to estimate a T_{NDT} for this material at or below -28°F in the quenched and tempered condition. Assuming a T_{NDT} of -28°F, Code Subsection NC, S77 Addenda would assign a PLSMT of +50°F.

SA350LF2, normalized, with an axial thickness of 6 5/8" is used in the feedwater system flued heads (Penetrations M5-M8). NUREG 0577 Table 4.4 would assign a T_{NDT} +1.3 standard deviations value of -5°F. The S77 Addenda to the Code, Subsection NC would assign a PLSMT of +62°F.

The main steam and feedwater penetrations are integral with the process pipe.

8. Cap Type Penetrations

SA420 WPL6 (SA516 Grade 70), normalized, 1 3/4" thick is identified as a limiting material in cap type penetrations. Code Subsection NC, S77 Addenda would assign a T_{NDT} of 0°F and a PLSMT of +30°F.

9. Multiple Penetration Header Plates

The limiting material identified is SA516 Grade 70 plate, normalized, and 1" thick. The T_{NDT} for this material in accordance with the ASME Code, Subsection NC, Table NC2311(a)1 is 0°F. The thickness correction in accordance with the Code, Subsection NC, S77 Addenda results in a PLSMT of +30°F.

10. Electrical Penetrations

Weld neck flange, 20" diameter, 1.69" thick, SA350 Grade LF1, normalized is determined to be the limiting material. NUREG 0577, Table 4.4 would assign this material a T_{NDT} at 1.3 standard deviation of -5°F. The PLSMT adjusted for thickness in accordance with Code, Figure NC 2311(a)1 is +25°F.

11. Main Steam Process Pipe and Header

(MK 2G369P-MS-1003-GA2-08-H and MK 2G369P-MS-1003-GA2-08-J, Typ.)

Process Pipe

(Part of MK 2G369P-MS-1003-GA2-08-H typical, 31 1/8" OD X 2 1/8" max. wall thickness)

SA 155 KCF 70 Class 1 (SA516 Grade 70) material is used, the finished pipe being in normalized condition. The T_{NDT} value for this material in the normalized condition is 0°F in accordance with the ASME Code Table NC2311(a)1. With thickness correction in accordance with the Code, the PLSMT is +30°F.

Extruded Header Assembly

(MK 2G369P-MS-1003-GA2-08-J typical, 33 7/8" OD X 3 1/2" wall thickness)

The material is SA234 WPBW fabricated from SA516 Grade 70, normalized plate, normalized after welding the longitudinal seam and hot forming outlets, and stress relieved after welding the fittings. The T_{NDT} value for this material in accordance with the ASME Code Table NC-2311(a)1 is 0°F. With thickness correction in accordance with the Code subsection NC, S77 Addenda, the PLSMT value is +48°F.

Branch Pipe (16" X 0.844" thickness)

The pipe is SA333 Grade 6, seamless, normalized, 0.844" maximum thickness. NUREG 0577 Table 4.4 would categorize the material as a C-Mn steel with a T_{NDT} +1.3 standard deviations value of -5°F. The ASME Code Subsection NC, S77 Addenda assigns a PLSMT of +25°F.

6", 1500 #LWN Flange

The material is SA350LF2, normalized, less than 2 1/2" thick. NUREG 0577 would categorize the material as a C-Mn steel to which Table 4.4 would assign a T_{NDT} value at 1.3 standard deviations of -5°F. The ASME, Subsection NC, Summer 77 Addenda assigns a PLSMT of +25°F.

Socket Weld Pipets, Bosses and Plugs (Fittings)

The limiting material in this category is SA350LF2 quenched and tempered, 2 1/2" maximum thickness. The average value for the material in the normalized condition is -28°F per Table 4.4 of NUREG 0577. It is reasonable to estimate a T_{NDT} in the quenched and tempered condition at or below -28°F. Allowing for thickness correction in accordance with the Code, Subsection NC, S77 Addenda, the PLSMT is +2°F.

Branch Pipe Cap

The material is a 16" Schedule 80 (0.844" wall) Butt Weld Cap. The material specification is SA420 WPL6 supplied as SA350LF2 material in the quenched and tempered condition. Based on NUREG 0577, the average T_{NDT} in the normalized condition is -28°F, and it is reasonable to assume that T_{NDT} in the quenched and tempered condition is -28°F or below. Assuming a T_{NDT} of -28°F and allowing for thickness correction in accordance with the Code, the PLSMT is +2°F.

12. Feedwater Process Pipe and Fittings (FW-1012-GA2-02-L typical)

The pipe material is SA333 Grade 6, normalized, 0.938" thick categorized as C-Mn steel by NUREG 0577. Table 4.4 assigns a T_{NDT} value at 1.3 standard deviations of -5°F. Applying a thickness correction in accordance with the Code Figure NC-2311(a)1, the PLSMT is +25°F.

The Pipet 18" S/120 X 3" S/160 BW is SA350LF2, normalized, less than 2 1/2" thick. The T_{NDT} value at 1.3 standard deviations based on NUREG 0577 is -5°F. Allowing for a thickness correction in accordance with the Code, Figure NC2311(a)1 the PLSMT is +25°F.

Pipet 18" X 1", 3M# SW, less than 2 1/2" wall is 350 LF2 quenched and tempered. NUREG 0577 would categorize the material as a C-Mn steel to which Table 4.4 would assign an average NDT temperature of -28°F in the normalized condition. It is reasonable to assume the T_{NDT} in the quenched and tempered condition of -28°F or below. Assuming a T_{NDT} of -28°F. The ASME Code, Summer 77 Addenda assigns a PLSMT of +2°F.

13. Main Steam Isolation Valves (FSV 7414 Typ.)

The body is 2 3/16" design thickness, SA216WCB, normalized and tempered. NUREG 0577 Figure B2 would assign a T_{NDT} at or below the +35°F average T_{NDT} given in Table 4.4. Assuming a T_{NDT} of +35°F conservatively, the Code Subsection NC, S77 addenda assigns a PLSMT of +65°F.

The bonnet (cover) is 12 1/4" thick SA-105, quenched and tempered. The average value of T_{NDT} for this material in accordance with NUREG 0577 Table 4.4 is -28°F in the normalized condition. It is reasonable to estimate a T_{NDT} for this material in the quenched and tempered condition at or below -28°F. Assuming a T_{NDT} of -28°F, the Code Subsection NC, S77 Addenda would assign a PLSMT of +59°F.

The disc (poppet) is 10.2" max. thickness SA-105 quenched and tempered. A reasonable T_{NDT} for this material is -28°F or below, as discussed above. Thickness correction in accordance with the Code, Subsection NC, S77 Addenda results in a PLSMT of +52°F.

The pilot poppet is SA182 F6 quenched and tempered with a maximum thickness of 2 1/4". The material was quenched and tempered at a relatively high temperature of 1300°F. Republic Steel Izod impact data indicates that with relatively high tempering temperatures, the properties are in the upper shelf energy range. It can reasonably be assumed that while the material cannot be characterized in terms of NDT, assurance of adequate fracture toughness is available at the LSMT of 120°F.

Bolting: The bolting is SA540 B23, quenched and tempered. This material is categorized in Table 4.6 of NUREG 0577 as having least susceptibility to brittle fracture.

14. Feedwater Check Valves (FW0067 Typ.)

Body: The body is SA216 WCB with a thickness of 2.2", normalized and tempered. NUREG 0577 Figure B2 would assign a T_{NDT} at or below the +35°F average T_{NDT} given in Table 4.4. Assuming a T_{NDT} of +35°F conservatively, the Code Subsection NC, S77 Addenda, would assign a PLSMT of +65°F.

Bonnet: The cover is SA-105, 4.53" thick quenched and tempered, (based on referenced heat treat procedure). NUREG 0577, Table 4.4 assigns an average T_{NDT} in the normalized condition of -28°F, based on which it is

reasonable to estimate T_{NDT} in the quenched and tempered condition of -28°F or below. The thickness correction per Code, subsection NC results in a PLSMT of +24°F.

Disc: The disc is SA216 WCB with a minimum thickness of 2.36", normalized and tempered. NUREG 0577 Figure B2 would assign a T_{NDT} at or below the +35°F average given in the Table 4.4. Assuming a T_{NDT} of +35°F, the Code Subsection NC, S77 Addenda, would assign a PLSMT of +65°F.

Bolting: The bolting is SA193 Grade B7. This material is categorized in Table 4.6 of NUREG 0577 as having least susceptibility to brittle fracture.

15. Feedwater Isolation Valves (FV 7143 Typ.)

Body, Lower Sections: These are SA350LF2 with a wall thickness of 2 3/4", quenched and tempered. NUREG 0577, Table 4.4 would assign an average T_{NDT} of -28°F based on which it is reasonable to estimate T_{NDT} with quenched and tempered condition of -28°F or below. The thickness correction per Code, Subsection NC results in a PLSMT of +7°F.

Body, Upper Section: This is SA350LF2, normalized and tempered, with a thickness of 2 3/4". NUREG 0577 assigns a T_{NDT} at 1.3 standard deviations of -5°F. Using the thickness correction of Code, Subsection NC results in a PLSMT of +30°F.

Body, Center Section: This is SA216 WCC with a design thickness of 2 1/4", normalized and tempered. NUREG 0577, Figure B2 would assign a T_{NDT} at or

below the +35°F average T_{NDT} given in Table 4.4. Assuming a T_{NDT} of +35°F conservatively, the Code Subsection NC, S77 Addenda, would assign a PLSMT of +65°F.

Bonnet: The bonnet is SA350 LF2, 4 3/4" quenched and tempered. NUREG 0577 Table 4.4 assigns an average T_{NDT} in the normalized condition of -28°F, based on which it is reasonable to estimate T_{NDT} in the quenched and tempered condition of -28°F or below. The thickness correction per Code, Subsection NC results in a PLMST of +26°F.

Gate And Segments: The material is SA487 Grade CA 6 NM in the normalized and tempered condition, with an estimated maximum thickness of 3". ASME publication MPC-13 "Fracture Toughness of Wrought and Cast Steels" Table 3 reports NDT temperatures for 5", 3", and 1" materials of at least -67°F. Conservatively assuming an upper bound T_{NDT} of -50°F, and correcting for thickness per Code, Subsection NC (S77 Addenda), the PLSMT is -10°F.

Bolting: The bolting is SA193 Grade B7. This material is categorized in Table 4.6 of NUREG 0577 as having least susceptibility to brittle fracture.

ATTACHMENT 1 - TABLE 1
SOUTH TEXAS PROJECT UNIT - 1 & 2
EVALUATION OF FRACTURE PREVENTION OF CONTAINMENT BOUNDARY
(GDC-51)

Component/ System	Item	Max. Thickness (In.)	Material	Heat Treatment	ASME III Subsection NC- Summer 77 Addenda	NUREG 0577	T_{NDT} (°F)	PLSMT (°F)	LSMT (°F)
Equip. Hatch	Bolt Flange	6	SA-516 Gr. 70	Q&T	Table NC-2311(a) -1		-10	52	70°F
	Hatch Shell	3.5	SA-S37 Class 1	Normalized	Table NC-2311(a) -1		-30	17	70°F
	Insert Plate	1	SA-516 Gr. 60	Normalized	Table NC-2311(a) -1		0	30	70°F
Personnel Airlock	Reactor End Shell Collar	6	SA-516 Gr. 70	Normalized	Table NC-2311(a) -1		0	62	70°F
Aux. Airlock	Collar Piece	3	SA-516 Gr. 70	Normalized	NC-2311(a) -1 Table		0	40	70°F
	Boss	3 7/8	SA-350 Gr. LF2	Q&T		Table 4.4	-28	22.	70°F
Penetration Sleeves	Penetration E 23, E24	1.031	SA-333 Gr. 6	Normalized		Table 4.4	-5	25	70°F
	Penetration M1 - M4	2.5	SA-516 Gr. 60	Normalized Cold formed & stress relieved	Table NC-2311a(1)		20	50	70°F
	Penetration 20, 21, 22	.968	SA-106 Gr. B	Normalized		Table 4.4	40	70	70°F
Flued Head Penetrations	Main Steam M1 - M4	9 5/8	SA350 LF2	Q&T		Table 4.4	-28	50	120°F
	Feed Water M5 - M8	6 5/8	SA-350 LF2	Normalized		Table 4.4	-5	62	120°F

W6B/RPD/jj

SOUTH TEXAS PROJECT UNIT - 1 & 2

EVALUATION OF FRACTURE PREVENTION OF CONTAINMENT BOUNDARY

(GDC-51)

Component/ System	Item	Max. Thickness (In.)	Material	Heat Treatment	ASME III Subsection NC- Summer 77 Addenda	NUREG 0577	T_{NDT} (°F)	PLSMT (°F)	LSMT (°F)
Cap Type Penetrations		1 3/4	SA420 WPL6 (SA516 Gr. 70)	Normalized	Table NC-2311(a) -1		0	30	70°F
Multiple Penetration Plates		1	SA-516 Gr. 70	Normalized	Table NC-2311(a) -1		0	30	70°F
Electrical Penetrations	Weld Neck Flange	1.69	SA-350 Gr. LF1	Normalized		Table 4.4	-5	25	70°F
Main Steam	Process Pipe	2 1/8	SA-155 KCF70 CL1 (SA-516 Gr. 70)	Normalized	Table NC-2311(a) -1		0	30	120°F
	Extruded Header Assembly	3 1/2	SA-234 WPBW (SA-516 Gr. 70)	Normalized	Table NC-2311(a) -1		0	48	120°F
	Branch Piping	.844	SA333 Gr. 6	Normalized		Table 4.4	-5	25	120°F
	6" 1500# LWN	2 1/2	SA350 LF2	Normalized		Table 4.4	-5	25	120°F
	Fittings	2 1/2	SA350 LF2	Q&T		Table 4.4	-28	2	120°F
	Branch Pipe Cap.	.844	SA420 WPL6 (SA350 LF2)	Q&T		Table 4.4	-28	2	120°F
Feedwater	Pipe	.938	SA333 Gr. 6	Normalized		Table 4.4	-5	25	120°F
	Pipet	2 1/2	SA350 LF2	Normalized		Table 4.4	-5	25	120°F
	Pipet	2 1/2	SA350 LF2	Q&T		Table 4.4	-28	2	120°F

W6B/RPD/jj

SOUTH TEXAS PROJECT UNIT - 1 & 2
EVALUATION OF FRACTURE PREVENTION OF CONTAINMENT BOUNDARY
(GDC-51)

Component/ System	Item	Max. Thickness (In.)	Material	Heat Treatment	ASME III Subsection NC- Summer 77 Addenda	NUREG 0577	T_{NDT} (°F)	PLSMT (°F)	LSMT (°F)
Main Steam Isolation Valve	Body	2 3/16	SA216 WCB	N&T		Table 4.4	35	65	120°F
	Bonnet	12 1/4	SA105	Q&T		Table 4.4	-28	59	120°F
	Disc.	10.2	SA105	Q&T		Table 4.4	-28	52	120°F
	Pilot Poppet	2 1/4	SA182 F6	Q&T		Upper	Shelf		
	Bolting		SA540 B23	Q&T		Least Susceptibility to fracture			brittle
Feed Water Check Valve	Body	2.2	SA216 WCB	N&T		Table 4.4	35	65	120°F
	Bonnet	4.53	SA105	Q&T		Table 4.4	-28	24	120°F
	Disc.	2.36	SA216 WCB	N&T		Table 4.4	35	65	120°F
	Bolting		SA-193 Gr. B7			Least Susceptibility to brittle			brittle
Feed Water Isolation Valve	Body Lowest Section	2 3/4	SA350 LF2	Q&T		Table 4.4	-28	7	120°F
	Body Upper Section	2 3/4	SA350 LF2	N&T		Table 4.4	-5	30	120°F
	Body Center Section	2 1/4	SA216 WCC	N&T		Table 4.4	35	65	120°F
	Bonnet	4 3/4	SA350 LF2	Q&T		Table 4.4	-28	26	120°F
	Gate & Gate Segments	3	SA487 Gr. CA 6NM	N&T			-50 See Text	-10	120°F
	Bolting		SA193 Gr. B7			Least Susceptibility to fracture			brittle

N&T - Normalized and Tempered
Q&T - Quenched and Tempered

W6B/R /jj

SOUTH TEXAS PROJECT UNIT - 1

EVALUATION OF FRACTURE PREVENTION OF CONTAINMENT BOUNDARY

(GDC-51)

INDEX of CMTRS & CODE DATA REPORTS FOR LIMITING ITEMS

Equipment Hatch

W6B/37EA/jj

EQ. Hatch Pr #.

PURCHASER:

4 PITTSBURGH-DES MOINES STEEL CO.
MR. JACK MCCARTHY
NEVILLE ISLAND
PITTSBURGH, PA. 15225

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320

TEST CERTIFICATE

MILL ORDER NO.	CUSTOMER P.O.	
70841 1	11-15679-656	6476 JW

DATE: 6/08/76 FILE NO. 6368-03-06
CONSIGNEE: PC #53

PGH-DES MOINES STEEL CO
NEVILLE ISLAND
PENNSYLVANIA 15225

FROM 5491

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S):

~~XXXXIXXERXXXXXMIXXXXIX~~ PDM MS 7.26 REV. B 9/26/75 GA-516 GR. 70 ASME CODE SECTION II & III SUB NE 1971 EDITION THRU WINTER 1973 ADDENDA N-1160 8/4/75

BEND TEST O.K. — HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti				GRAIN SIZE
C6297	.27	.92	.005	.022		.23						AL. TREATED			7-8

THIS REPORT HAS BEEN CHECKED AND FOUND TO COMPLY WITH APPLICABLE SPECIFICATIONS

Signed J. G. Brandt Date 6-10-76

15679
15680

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 2"	% R.A.	BHN	IMPACTS LV- 28 F			FRACTURE APPEARANCE % SHEAR	DESCRIPTION
C6297	1	540	800	27			26	24	24	20-20-20	2- 6" x 90 x 135 Item 1
		555	800	28			LATERAL EXPANSION IN INCHES				
							.022	.020	.019		

Plates and tests heated to 1625°F./1675°F., hold 1/2 hr. per inch s n., and water quenched, then tempered 1220°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 6 hrs. and furnace cooled within a rate of 100°F. per hr. to 800°F.

ARTHUR G. MCKEE & CO. RECEIVED JUN 10 1976

We hereby certify the above information is correct.

SUPERVISOR-TESTING H. H. Klin

84.10.31 13138

CE. FICATE OF TESTS

P. O. DUA

OUR ORDER NO.	CUST ORDER NO.	SHIPPED VIA	CAR INITIAL AND NO.	DATE SHIPPED	SHIPPER NO.	
HS 5937	894	RAIL	MP 650077	1/ /75	7103778	1/22/75

DESCRIPTION	BAR OR PLATE No.	No. PCS.	YIELD PSI	TENSILE PSI	% ELONG.	% REDUCT.	BEND TEST	FRACT. TEST	BHN	IMPACT TYPE A NOTCH V SIZE F ORIEN.	TEMP.	1	2	3	AVG.
PLTS FOR PV NOM: ASME SA537 CL 1 MOD TO THICK PER CODE CASE 1646 MOD TO LO S (.01C)X) REM TREAT & P-DM SPEC MS-10.9 REV A(4/1/74) +S1 VAC DEGAS +S3 SPCMT TEST CPNS @ 1125+OR-25F FOR 15 HRS PER MB 4620 +S5 CVNT 50 FT LBS & 35 MILS L.E. @ +20F RPT % SHEAR +S6 DWT PER E208 NO BAK @ -40F PER PLT +S12 UT PER A578-68+S1 100% SCAN +S2 ACCEPTANCE STD PER MB-2532. 1(B) RESCALED +S53 RPT RESIDUALS. ALL TO MEET B&PV CODE SECT II & III S/73 ADDENDA. TYPE P3 DWT SPECIMENS.					2"									
HEAT: 56464 3-1/2 x 64 x 217" Item @ 14676 D 7227	4892I	2	50600	78700	33.0			ok		T +20°F	61	70	76	69
										LS IN MILS	54	60	64	59
										% SHEAR	80	80	85	82
										2 DWTT-40°F NO BREAK - LONGITUDINAL				
										PLTS & TEST CPNS WERE NORMALIZED @ 1650°F, TIME @ TEMP: 75 MINUTES & AIR COOLED. **				
HEAT: 47111 3-1/2 x 64 x 217" Item @ 14676 D 7229	4894I	2	50900	77600	33.0			ok		T +20°F	50	53	63	55
										LE IN MILS	42	50	57	50
										% SHEAR	40	40	40	40
										2 DWTT-40°F NO BREAK - LONGITUDINAL				

THIS REPORT HAS BEEN CHECKED AND FOUND TO COMPLY WITH APPLICABLE SPECIFICATIONS

Signed [signature] Date 4-21-75

Sold To Part 10.9 Rev C
See Ltr Ref PDA-2

JC 8-27-76

CONTINUED PG. 2

HEAT	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Ti	V	B	Cb	Al	N	GRAIN
56464	.19	1.33	.010	.006	.31	.25	.15	.07	.14							8
47111	.19	1.39	.010	.010	.34	.23	.16	.05	.17							8
47201	.18	1.37	.011	.006	.37	.20	.16	.06	.11							8
47123	.18	1.39	.010	.010	.40	.25	.16	.06	.12							8
47239	.20	1.35	.010	.008	.39	.22	.15	.07	.12							

THE CHEMICAL, PHYSICAL OR MECHANICAL TESTS REPORTED HEREWITH ARE CORRECT AS CONTAINED IN THE RECORDS OF THE CORPORATIO

SIGNED J. D. Roberts METALLURGICAL DEPT.

1 of 4

PITTSBURGH-DES MOINES STEEL CO
~~PO BOX 1647~~
~~PROVO, UTAH~~
Neville Island Pa

"THIS CERTIFIED TEST REPORT HAS BEEN DELIVERED TO A CONSIGNEE OF MATERIAL PURCHASED FROM ARMCO STEEL CORPORATION. TO AVOID THE POSSIBILITY OF ITS MISUSE, ON THE REDELIVERY OF THIS REPORT TO A THIRD PARTY IT MUST BE RECERTIFIED BY AND UNDER THE NAME OF SUCH CONSIGNEE."

FH 1538 REV. 1/73

17011050000

CE[illegible]TIFICATE OF TES[illegible]

OUR ORDER NO	CUST. ORDER NO	SHIPPED VIA	CAR INITIAL AND NO	DATE SHIPPED	SHIP REF. NO	DATE MFR	BY
THS 5937	894		MP 6500777	1-7-75	7103778		

IMPACT: TYPE A NOTCH V SIZE F

DESCRIPTION	BAR OR PLATE No.	No. PCS.	YIELD PSI	TENSILE PSI	% ELONG.	% REDUCT.	BEND TEST	FRACT. TEST	BHN	ORIEN.	TEMP.	1	2	3	AVG.
					2"										
SEE HEADING, PG. 1															
HEAT: 47201 3-1/2 x 64 x 217"	6181I	1	50700	80400	28.0		ok			T	+20°F	83	84	87	85
HC 14676 D 7254										LE IN MILS		75	75	77	76
										% SHEAR		70	70	70	70
										2 DWTT-40°F NO BREAK - LONGITUDINAL					
	6183I	2	50400	74900	34.0		ok			T	+20°F	90	93	96	93
HC 14676 D 7228										LE IN MILS		76	78	78	77
										% SHEAR		60	70	70	67
										2 DWTT-40°F NO BREAK - LONGITUDINAL					
HEAT: 47123 3-1/2 x 64 x 217"	4896I	1	50900	79700	30.0		ok			T	+20°F	52	55	57	55
HC 14676 D 7226										LE IN MILS		51	51	57	53
										% SHEAR		35	35	40	37
										2 DWTT-40°F NO BREAK - LONGITUDINAL					

PLTS & TEST CPNS WERE NORMALIZED @ 1650°F, TIME @ TEMP: 70 MINUTES & AIR COOLED.
** TEST CPNS WERE STRESS RELIEVED @ 1125°F, TIME @ TEMP: 15 HRS & FURNACE COOLED.*
*MAX HEATING RATE ABOVE 600°F: 114°F/HR
MAX COOLING RATE DOWN TO 600°F: 143°F/HR

FC 8-27-76

COPY

CONTINUED PG. 3

HEAT	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Ti	V	B	Cb	Al	N				GRAIN

THIS REPORT HAS BEEN CHECKED AND FOUND TO COMPLY WITH APPLICABLE SPECIFICATIONS

Signed [signature] Date 4-21-75

Subject to mod. 10. 9 [illegible]
SEE ECAR PQA-2.

THE CHEMICAL, PHYSICAL OR MECHANICAL TESTS REPORTED HEREWITH ARE CORRECT AS CONTAINED IN THE RECORDS OF THE CORPORATION.

PITTSBURGH-DES MOINES STEEL CO
Neville Island Pa

SIGNED J. A. Roberts
METALLURGICAL DEPT

"THIS CERTIFIED TEST REPORT HAS BEEN DELIVERED TO A CONSIGNEE OF MATERIAL PUR-CHASED FROM ARMCO STEEL CORPORATION. TO AVOID THE POSSIBILITY OF ITS MISUSE, ON THE REDELIVERY OF THIS REPORT TO A THIRD PARTY IT MUST BE RECERTIFIED BY AND UNDER THE NAME OF SUCH CONSIGNEE."

FM-1536 REV. 11-73

8701110500(0

ID-A3391 THRU ID-A3393

15679
15680

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320
TEST CERTIFICATE

DATE 8/27/76 FILE 58-03-06

PURCHASER
PITTSBURGH-DES MOINES STEEL CO.
MR. JACK McCARTHY
NEVILLE ISLAND
PITTSBURGH, PA. 15225

CONSIGNEE
PGH-DES MOINES STEEL CO.
NEVILLE ISLAND
PENNSYLVANIA 15225

MILL ORDER NO.	CUSTOMER P.O.	
71774 1	11-15679-346	28676 BI

H. H. Kline

REVISED COPY 9-7-76

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

PDM NS 7.29 REV. 6 DTD 1/5/76 SA-516 GR.60 ASME CODE SEC. VIII DIV 1 1971 EDIT. THRU WINTER 1973 ADDENDA N-1160 8/4/78 BC 9-24-76

BEND TEST HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B		GRAIN SIZE
C7185	[illegible]	1.16	.008	.021		.23									7-8

Please destroy other test report previously sent.
This is a revised copy.
Reason: Error in spec.
Sorry we caused you an inconvenience.

9-23-76

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 8"	% R.A.	BHN	IMPACTS CV 0 F			DROP WT. APP. FRACT. % SHEAR	DESCRIPTION
											ID A3391 2 1 X 84 X 247
C7185	12	494	654	26			166	168	170	99-99-99	
					LATERAL EXPANSION IN INCHES		.099	.098	.099		
											ID A3393 2- "
C7185	7A	461	650	30			176	185	183	99-99-99	
					LATERAL EXPANSION IN INCHES		.096	.088	.092		
											ID A3392 2- 1 X 84 X 219
C7185	6A	449	644	26			182	186	180	99-99-99	
					LATERAL EXPANSION IN INCHES		.098	.094	.096		

COPY

PLATES AND TESTS NORM. 1625 F./1675 F. HELD 1/2 HR. PER INCH MIN. AND AIR COOLED.

ID-A3391 THRU ID-A3393

H. H. Kline

We hereby certify the above information is correct.

7811180066

Personnel Airlocks

W6B/37EA/jj

FORM N-1A MANUFACTURERS' DATA REPORT FOR NUCLEAR VESSELS
Alternate Form for Single Chamber Completely Shop-Fabricated Vessels Only
As required by the Provisions of the ASME Code Rules

1. Manufactured by W.J. WOOLLEY CO., RIVER FOREST, ILLINOIS 60305
(Name and address of Manufacturer)

2. Manufactured for PITTSBURGH-DES MOINES STEEL CO. - PITTSBURGH, PA
(Name and address of Purchaser)

3. Type Horiz. (Horiz. or Vert.) Vessel No. (1073-1) (Mfrs. Serial) (N/A) (State & State No.) Natl. Bd. No. N/A Year Built 1980

3a. Applicable ASME Code: Section III, Edition 1974, Addenda date Winter '75, Case No. N/A Class MC

4. Shell: Material SA516 Gr.70 (Kind & Spec. No.) T.S. 70,000 (Min. of range specified) Nom. Thk. 1/2 In. Corr. Allow — In. Dia. 12 Ft. 4-1/4 In. Length 18 Ft. 3 In.

5. Seams: Long Welded Butts R.T.[1] Yes R.T. Yes Efficiency 100 %
Girth Welded Butts H.T.[1] Yes R.T. Yes No. of Courses 3

6. Heads: (a) Material SA516 Gr.70 T.S. 70,000 (b) Material SA516 Gr.70 T.S. 70,000

Location (Top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a) Shell Ends	React. Cont.	2-1/2"	1-3/4" Rib Reinforced				138"	
(b) Doors	React. Cont.	1-3/4"	Rib Reinforced				50"x90"	

If removable, bolts used 1" (Material, Spec. No., T.S., Size, Number) Other fastening — (Describe or Attach Sketch)

7. Design Pressure[2] 56.5 psi at max. temp. 200 °F. at temp. of -20 °F. Drop Weight N/A Charpy Impact 20 ft-lb Pneumatic or Hydrostatic Test Press 55.0 psi.

8. Safety or Relief Valve Outlets: Number — Size — Location None Supplied

9. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Diam. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
Unit to ship without appurtenances							

10. Openings: Inspection Manholes, No. — Size — Location —
Handholes, No. — Size — Location —
Sight Glass Threaded, No. 2 Size 7" Dia Location 1 each door

11. Supports: Skirt — (Yes or No) Lugs — (Number) Legs 3/4" thk. (Number) Other — (Describe) Attached — (Where & How)

12. Remarks: This Data Report covers one personnel airlock only as listed in Brown & Root design specification 2C2695S006 Rev. 3 as a code stamped MC component. See attached manufacturer's partial Data Report (Form N-2) issued and approved by Murdock, Inc.
(Brief description of purpose of the vessel—State Contents.)

[1] If Postweld Heat-Treated.
[2] List other internal or external pressure with coincident temperature when applicable.

We certify that the statements made in this report are correct and that this nuclear vessel conforms to the rules of construction of the ASME Code, Section III.

Date 2-21-1980 Signed W.J. WOOLLEY CO. (Manufacturer) By [signature]

Certificate of Authorization Expires May 3, 1980 Certificate of Authorization No. N-1733

CERTIFICATION OF DESIGN

Design information on file at Brown & Root, Inc., Houston, Texas

Stress analysis report on file at W.J. Woolley Co., River Forest, Illinois

Design specifications certified by H.S. Cameron, Jr. Prof. Eng. State Texas Reg. No. 26694

Stress analysis report certified by R.A. Maffei Prof. Eng. State Illinois Reg. No. 62-36033

CERTIFICATE OF SHOP INSPECTION

VESSEL MADE BY W.J. Woolley Co. at River Forest, Illinois

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of California and employed by HSBCI of Hartford, Connecticut have inspected the pressure vessel described in this Manufacturer's Data Report on 11-30 1979, and state that to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel 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 pressure vessel described in this Manufacturer's 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 2-21 1980 Commissions CA 1210
(Inspector's Signature) (National Board, State, Province and No.)

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in items 1to 11 on this Data report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded in item 12, "Remarks".

Printed in U.S.A. (4/72) This form (E32) is obtainable from the ASME, 345 E. 47th St., New York, N.Y. 10017

FORM N-2 NPT CERTIFICATE HOLDERS' DATA REPORT FOR NUCLEAR PART AND APPURTENANCES*

As required by the Provision of the ASME Code Rules, Section III, Div. 1

(a) Manufactured by MURDOCK, INC., 15300 S. Avalon Blvd., Compton, CA 90220
(Name and address of NPT Certificate Holder)

(b) Manufactured for W.J. WOOLLEY CO., 7425 W. Lake St., River Forest, Illinois 60305
(Name and address of N Certificate Holder for completed nuclear component)

2. Identification-Certificate Holder's Serial No. of Part MI 084 Nat'l Bd. No. N/A

(a) Constructed According to Drawing No. 73-1PLA-01 Rev. 4 Drawing Prepared by W.J. WOOLLEY CO.

(b) Description of Part Inspected PERSONNEL AIR LOCK

(c) Applicable ASME Code: Section III, Edition 1974, Addenda date Winter 1975, Case No. N/A Class MC

3. Remarks: Personnel air lock for concrete containment vessel.
(Brief description of service for which component was designed)

Part not pressure tested by this manufacturer for Code acceptance.

(See attachment #1, 1 sheet) NOTE: See amended data, Page 2 of 2.

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the NPT Certificate Holder for parts. An NPT Certificate Holder for appurtenances is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the component Design Specification and Stress Report.)

Date February 13 1980 Signed MURDOCK, INC. By
(NPT Certificate Holder)

Certificate of Authorization Expires January 5, 1982 Certificate of Authorization No. N-1290

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

Design information on file at Brown & Root, Inc., Houston, Texas

Stress analysis report on file at W.J. Woolley Co., River Forest, Illinois

Design specifications certified by H.S. Cameron, Jr. Prof. Eng. State Texas Reg. No. 26694

Stress analysis report certified by R.A. Maffei Prof. Eng. State Illinois Reg. No. 62-36083

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 or Province of California and employed by LIC** of Long Grove, Illinois have inspected the part of a pressure vessel described in this Partial Data Report on 2-13 1980, and state that to the best of my knowledge and belief, the NPT Certificate Holder has constructed this part 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 part described in this Partial 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 2-13 1980

Inspector's Signature Commissions Ohio 975
National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½ x 11", (2) information in items 1 to 3 of 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.

Items 4–8 Incl. to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

4. Shell: Material SA516 Gr.70 (Kind & Spec. No.) T.S. 70,000 (Min. of Range Specified) Nominal Thickness 1/2 in. Corrosion Allowance N/A in. Dia. 12 ft. 4-1/4 in. Length 18 ft. 3 in.

Seams: Long Welded Butts H.T.[1] Yes R.T. Yes Efficiency 100 %

Girth Welded Butts H.T.[1] Yes R.T. Yes No. of Courses 3

6. Heads: (a) Material SA516 Gr.70 T.S. 70,000 (b) Material SA516 Gr.70 T.S. 70,000

Location (Top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Shell Ends	Reactor Cont.	2-1/2"	Rib Reinforced				139"	
(b) Doors	Reactor Cont.	1-3/4"	Rib Reinforced				60"x90"	

If removable, bolts used N/A (Material, Spec. No., T.S., Size, Number) Other fastening N/A (Describe or attach sketch)

7. Jacket Closure: N/A (Describe as ogee and weld, bar, etc. If bar give dimensions, if bolted, describe or sketch)

Drop Weight N/A
Charpy Impact 20 ft-lb at temp. of -20 °F

8. Design pressure[1] 56.5 psi at 286 °F

Items 9 and 10 to be completed for tube sections

9. Tube Sheets: Stationary. Material N/A (Kind & Spec. No.) Dia. (Subject to pressure) Thickness in. Attachment (Welded, Bolted)

Floating. Material N/A Dia. Thickness in. Attachment

10. Tubes: Material N/A O.D. in. Thickness inches or gage. Number Type (Str. or U)

Items 11–14 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

11. Shell: Material N/A (Kind & Spec. No.) T.S. (Min. of Range Specified) Nominal Thickness in. Corrosion Allowance in. Dia. ft. in. Length ft. in.

12. Seams: Long H.T.[1] R.T. Efficiency %

Girth H.T.[1] R.T. No. of Courses

13. Heads (a) Material N/A T.S. (b) Material T.S.

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Top, bottom, ends								
(b) Channel								

If removable, bolts used (a) (b) (c) Other fastening (Describe or attach sketch)

Drop Weight
Charpy Impact ft-lb at temp. of °F

14. Design pressure[1] psi at °F

Items below to be completed for all vessels where applicable.

15. Safety Valve Outlets: Number - 0 - Size Location None supplied

16. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Dia. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
(See attachment #1, 1 sheet)							

Inspection Openings: Manholes, No. - 2 - Size 60"x90" Location Shell ends (Doors Item 6(b)).
Handholes, No. - 0 - Size Location
Sight Glass. Threaded, No. 2 Size 2"dia.3/4"thk Location 1 each door

18. Supports: Skirt No (Yes or No) Lugs - 0 - (Number) Legs - 0 - (Number) Other N/A (Describe) Attached N/A (Show by Sketch)

[1] If Postweld Heat Treated

ATTACHMENT #1 Sheet 1

1. (a) Manufactured by MURDOCK, INC., 15800 S. Avalon Blvd., Compton, CA 90220

   (b) Manufactured for W.J. WOOLLEY CO., 7425 W. Lake St., River Forest, Ill. 60305

2. Identification-Certificate Holder's Serial No. of Part MI 084 Nat'l Bd. No. N/A

   (a) Constructed According to Drawing No. 73-1PLA-01 Rev. 4
   Drawing Prepared by W.J. WOOLLEY CO.

   (b) Description of Part Inspected PERSONNEL AIR LOCK

   (c) Applicable ASME Code: Section III, Edition 1974, Addenda date Winter 1975,
   Case No. N/A Class MC

ITEM NO. 16 NOZZLES:

Purpose	Number	Dia. or Size	Material	How Attached
Elect. Penet.	2	6"	SA350 LF 2	Welded
Emer. Air	1	3"	SA333 Gr. 6	Welded
Mech. Hub	2	4-1/2"	SA350 LF 2	Welded
Gauge Coupling	17	1/2"	SA105	Welded
Equalizing Coupling	2	1"	SA350 LF 2	Welded
Over Press. Relief Coupling	1	2"	SA350 LF 2	Welded

FORM N-2 NPT CERTIFICATE HOLDERS' DATA REPORT FOR NUCLEAR PART AND APPURTENANCES*

As required by the Provision of the ASME Code Rules, Section III, Div. 1

1. (a) Manufactured by MURDOCK, INC., 15800 S. Avalon Blvd., Compton, CA 90220
(Name and address of NPT Certificate Holder)

(b) Manufactured for W.J. WOOLLEY CO., 1315 West 22nd St., Oak Brook, Illinois 60521
(Name and address of N Certificate Holder for completed nuclear component)

2. Identification-Certificate Holder's Serial No. of Part MI 084 Nat'l Bd. No. N/A

(a) Constructed According to Drawing No. 73-1PLA-01 Rev. 4 Drawing Prepared by W.J. Woolley Co.

(b) Description of Part Inspected Personnel Air Lock

(c) Applicable ASME Code: Section III, Edition 1974, Addenda date Winter 1975, Case No. N/A Class MC.

3. Remarks: To accomodate Detail Drawing Revisions after date of original
(Brief description of service for which component was designed)
N-2 Form signatures, and to change address as noted in item 1. (b).

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the NPT Certificate Holder for parts. An NPT Certificate Holder for appurtenances is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the component Design Specification and Stress Report.)

Date Aug 12 19 82 Signed MURDOCK, INC. By W B Parker
(NPT Certificate Holder)

Certificate of Authorization Expires January 5, 1985 Certificate of Authorization No. N-1290

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

Design information on file at BROWN & ROOT, INC., HOUSTON, TEXAS

Stress analysis report on file at W.J. WOOLLEY CO., OAK BROOK, ILLINOIS

Design specifications certified by H.S. Cameron Prof. Eng. State Texas Reg. No. 26624

Stress analysis report certified by R.A. Maffei Prof. Eng. State Illinois Reg. No. 62-36083

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 or Province of California and employed by LMC** of Long Grove, Illinois have inspected the part of a pressure vessel described in this Partial Data Report on FEB 12 1982 and state that to the best of my knowledge and belief, the NPT Certificate Holder has constructed this part 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 part described in this Partial 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 Feb 12 19 82

Inspector's Signature Commission CA 1256
National Board, State, Province and No.

* Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½ x 11, (2) information in items 1&2 on this data report is included on each sheet, and (3) each sheet is signed and dated by the Inspector and the N Certificate Holder.

** Employers Mutual Casualty Company

Items 4–8 Incl. to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

4. Shell: Material SA516 Gr.70 (Kind & Spec. No.) T.S. 70,000 (Min. of Range Specified) Nominal Thickness 1/2 in. Corrosion Allowance N/A in. Dia. 12 ft. 4-1/4 in. Length 18 ft. 3 in.

Seams: Long Welded Butts H.T.[1] Yes R.T. Yes Efficiency 100 %

Girth Welded Butts H.T.[1] Yes R.T. Yes No. of Courses 3

6. Heads: (a) Material SA516 Gr.70 T.S. 70,000 (b) Material SA516 Gr.70 T.S. 70,000

Location (Top, bottom, ends)	Thickness	Crown Rad.	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Shell Ends	Reactor Cont. 2-1/2"		Rib Reinforced				138"	
(b) Doors	Reactor Cont. 1-3/4"		Rib Reinforced				60"x90"	

If removable, bolts used N/A (Material, Spec. No., T.S., Size, Number) Other fastening N/A (Describe or attach sketch)

7. Jacket Closure: N/A (Describe as ogee and weld, bar, etc. If bar give dimensions, if bolted, describe or sketch)

Drop Weight N/A
Charpy Impact 20 ft-lb
at temp. of -20 °F

8. Design pressure[2] 56.5 psi at 286 °F

Items 9 and 10 to be completed for tube sections

9. Tube Sheets: Stationary. Material N/A (Kind & Spec. No.) Dia. (Subject to pressure) Thickness in. Attachment (Welded, Bolted)

Floating. Material N/A Dia. Thickness in. Attachment

10. Tubes: Material N/A O.D. in. Thickness inches or gage. Number Type (Str. or U)

Items 11–14 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

Shell: Material N/A (Kind & Spec. No.) T.S. (Min. of Range Specified) Nominal Thickness in. Corrosion Allowance in. Dia. ft. in. Length ft. in.

12. Seams: Long N/A H.T.[1] R.T. Efficiency %

Girth H.T.[1] R.T. No. of Courses

13. Heads (a) Material N/A T.S. (b) Material T.S.

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Top, bottom, ends								
(b) Channel								

If removable, bolts used (a) (b) (c) Other fastening (Describe or attach sketch)

Drop Weight
Charpy Impact ft-lb
at temp. of °F

14. Design pressure[2] N/A psi at °F

Items below to be completed for all vessels where applicable.

15. Safety Valve Outlets: Number -0- Size Location None Supplied

16. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Dia. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
(See attachment #1, 1 sheet)							

Inspection Manholes, No. 2 Size 60"x90" Location Shell ends [Doors Item 6(b)]
Openings: Handholes, No. -0- Size Location
Sight Threaded, No. 2 Size 2@1a, 2/4" pb Location 1 each door
Glass

18. Supports: Skirt No (Yes or No) Lugs -0- (Number) Legs -0- (Number) Other N/A (Describe) Attached N/A (Describe How)

[1] If Postweld Heat Treated
[2] At coincident design metal temperature with corresponding allowable stress

LUKENS STEEL COMPANY
COATESVILLE 19320

DATE 5-5-78
CONSIGNEE

TEST CERTIFICATE

Murdock, Inc.
Compton, CA

MILL ORDER NO	CUSTOMER P.O.	MP 3178 VS
77072-12	22510-M	

THIS IS TO CERTIFY THAT THE MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATIONS:

SA-516 Gr. 70 ASME Code SECT. II & III Sub NE 1974 Edition thru Winter 1975 Addenda N-1160 8/4/78

BEND TEST HOMOGENEITY TEST

CHEMICAL ANALYSIS

HEAT NO	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B	Grain Size
2325	.27	1.13	.009	.008		.25							VIP Steel	7-8

NUCLEAR

SURVEILLANCE SPECIMEN 72

SEP 09 1980

PHYSICAL PROPERTIES

HEAT NO	SLAB NO	YIELD PSI X100	TENSILE PSI X100	% ELONG IN 2"	% R.A.	IMPACTS XXX XXX Loc.	V-Notch -20°F.		Fracture Appearance % Shear
2325	1	508	813	29		T	30	23	20	20-20-20
						L	32	30	30	50-50-50
						Lateral Expansion in Inches				
						T	.017	.020	.027	
						L	.029	.026	.028	

DESCRIPTION: 1 - 6" x 120 x 150

Plate and tests norm. 1625-1675°F., held 1/2 hr. per inch min. and air cooled.

Tests stress relieved by heating within a rate of 100°F. per hr. to 1100-1150°F., held 15 hrs. and furnace cooled within a rate of 100°F. per hr. to 800°F.

MURDOCK INC.
LOI # A2B409
JOB # WOL 3-3007-05 3-3008-05
DATE 3-16-78

IPC 6 X 120 X 150

NOV 1 5 1978

BECHTEL 281

I hereby certify the above information is correct.

A.I. REVIEW

WOL
SUPERVISOR TESTING

Auxiliary Airlocks

W6B/37EA/jj

FORM N-1A N CERTIFICATE HOLDERS' DATA REPORT FOR NUCLEAR VESSELS*

Alternate Form for Single Chamber Completely Shop-Fabricated Vessels Only

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

1. Manufactured by W. J. Woolley Co., 4955 Spring Grove Ave., Cincinnati, Ohio 45232
(Name and address of N Certificate Holder)

2. Manufactured for Pittsburgh-Des Moines Steel Co., Pittsburgh, PA
(Name and address of Purchaser)

3. Type Horiz. (Horiz. or vert.) Vessel No. (73-1ELA-01) (Mfrs. Serial No.) CRN No. N/A Nat'l Bd. No. N/A Yr. Built 1984

3a. Applicable ASME Code: Section III, Edition 1974 ; Addenda date Winter '75 ; Case No. N/A Class MC

4. Shell: Material SA516 Gr. 70 (Kind & Spec. No.) T.S. 70,000 (Min. of range specified) Nom. Thk 1/2 in. Corr. Allow. N/A in. Diam. 5 ft. 6 in. Length 10 ft. 0 in.

5. Seams: Long Welded Butt H.T.[1] yes R.T. yes Efficiency 100 %

Girth Welded Butt H.T.[1] yes R.T. yes No. of Courses 2

6. Heads: (a) Material SA516 Gr. 70 T.S. 70,000 (b) Material SA516 Gr. 70 T.S. 70,000

	Location (top, (bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diam.	Side to Pressure (convex or concave)
(a)	Shell ends	Reactor Outer	2* 1*	Rib Reinforced				55*	
(b)	Doors	Reactor Outer	2* 2*					36*	

If removable, bolts used N/A (Material, Spec. No., T.S., Size, Number) Other fastening N/A (Describe or attach sketch)

7. (a) Design Pressure[1] 56.5 psi at Max. Temp. 286 °F (b) Min. Pressure-Test Temp. -20 °F
(c) Hydrostatic, Pneumatic, or Combination Test Pressure 65 psi

8. Safety or Relief Valve Outlets: Number ____ Size ____ Location None Supplied

9. Nozzles:

Purpose (inlet, outlet, drain)	Number	Diam. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
N/A							

10. Inspection Manholes: No. 2 Size 36" dia. Location Shell Ends (door item 6(B)
Openings: Handholes: No. 0 Size ____ Location ____
Threaded: No. 2 Size 7"dia.x3/4" thk. Location Shell Ends (One each end)

11. Supports: Skirts No (Yes or no) Lugs 0 (Number) Legs 0 (Number) Other N/A (Describe) Attached N/A (Where & how)

12. Remarks: 1) This data report modified to accomodate detail drawing revisions after date of original N-1A Form signature (See attachment A for listing of applicable manufacturers data reports).
2) This data report outlines one (1) emergency airlock, listed in Bechtel Power Corp. Spec. 2C269SS0006 - Rev. 3, as a ASME Code stamped N-Class MC-Component.
(Brief description of purpose of the vessel. State contents.)

We certify that the statements made in this report are correct and that this nuclear vessel conforms to the rules of construction of the ASME Code, Section III.

Date 11-20 19 84 Signed W. J. Woolley Company (N Certificate Holder) By Tom Francis

Certificate of Authorization Expires May 3, 1986 Certificate of Authorization No. N-1733

BECHTEL 606

[1] If postweld heat-treated. [2] List other internal or external pressures with coincident temperature when applicable.
*Supplemental sheets in form of lists, sketches, or drawings may be used provided: (1) size is 8½ in. x 11 in.; (2) information in items 1 through 3 of this Data Report is included on each sheet; and (3) each sheet is numbered and the number of sheets is recorded in item 12, *Remarks*.

COPY

FORM N-1A MANUFACTURERS' DATA REPORT FOR NUCLEAR VESSELS*

Alternate Form for Single Chamber Completely Shop-Fabricated Vessels Only

As required by the Provisions of the ASME Code Rules

1. Manufactured by W.J. WOOLLEY CO., River Forest, Illinois 60305
(Name and address of Manufacturer)

2. Manufactured for PITTSBURGH-DES MOINES STEEL CO., Pittsburgh, Pa.
(Name and address of Purchaser)

3. Type Horiz. (Horiz. or Vert.) Vessel No. 73-1ELA-01 N/A (Mfrs. Serial) (State & State No.) Natl. Bd. No. N/A Year Built 1980

3a. Applicable ASME Code: Section III, Edition 1974, Addenda date Winter '75 Case No. N/A Class MC

4. Shell: Material SA516 Gr.70 (Kind & Spec. No.) T.S. 70,000 (Min. of range specified) Nom. Thk. 1/2 in. Corr. Allow N/A in. Dia. 5 Ft. 6 in. Length 10 Ft. 0 in.

5. Seams: Long Welded Butts T. Yes R.T. Yes Efficiency 100 %

Girth Welded Butts T. Yes R.T. Yes No. of Courses 2

6. Heads: (a) Material SA516 Gr.70 T.S. 70,000 (b) Material SA516 Gr.70 T.S. 70,000

Location (Top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a) Shell Ends	Reactor Outer 1"		Rib Reinforced				55"	
(b) Doors	Reactor Outer 2"						36"	

If removable, bolts used N/A (Material, Spec. No., T.S., Size, Number) Other fastening N/A (Describe or Attach Sketch)

Drop Weight N/A Charpy impact 20 ft-lb Hydrostatic Pneumatic or Combination } Test Press 65 psi.

7. Design Pressure 56.5 psi at max. temp 286 °F. at temp. of -20 °F.

8. Safety or Relief Valve Outlets: Number ____ Size ____ Location None Supplied

9. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Dia. or Size	Type	Material	Thickness	Reinforcement Material	How Attached

10. Openings: Inspection Manholes, No. 2 Size 36"Dia. Location Shell Ends [Doors Item 6(b)]
Handholes, No. 0 Size ____ Location ____
Sight Glass Threaded, No. 2 Size 7"Dia.x3/4"Thk. Location Shell Ends [One each end]

11. Supports: Skirt No (Yes or No) Lugs 0 (Number) Legs 0 (Number) Other N/A (Describe) Attached N/A (Where & How)

12. Remarks: This data report covers one emergency air lock for Unit #1 listed in Brown & Root design specification 2C269SS006, Rev. G as a Code stamped MC component. See attached Manufacturer's Partial Data Report (Form N-2) issued and approved by Murdock, Inc., MI #086.
(Brief description of purpose of the vessel—State Contents.)

† If Postweld Heat-Treated.
‡ List other internal or external pressure with coincident temperature when applicable.

We certify that the statements made in this report are correct and that this nuclear vessel conforms to the rules of construction of the ASME Code, Section III.

Date DEC 11 19 80 Signed W.J. WOOLLEY CO. By [signature]
(Manufacturer)

Certificate of Authorization Expires May 3, 1983 Certificate of Authorization No. N-1733

CERTIFICATION OF DESIGN

Design information on file at Brown & Root, Inc., Houston, Texas

Stress analysis report on file at W.J. Woolley Co., River Forest, Illinois

Design specifications certified by H.S. Cameron, Jr. Prof. Eng. State Texas Reg. No. 26694

Stress analysis report certified by R.A. Maffei Prof. Eng. State Illinois Reg. No. 62-36083

CERTIFICATE OF SHOP INSPECTION

VESSEL MADE BY W.J. Woolley Co. at River Forest, Illinois

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of California and employed by HSB&I Co. of Hartford, Connecticut

have inspected the pressure vessel described in this Manufacturer's Data Report on 12-11 19 80, and state that to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel 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 pressure vessel described in this Manufacturer's 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 12-11 19 80

[signature] Commissions CALIF 1107
Inspector's Signature J.F. MANION National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in items 1-3 on this data report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded in item 12 "Remarks".

Printed in U.S.A. (4/72) This form (E24) is obtainable from the ASME, 345 E. 47th St., New York, N.Y. 10017

1. (a) Manufactured by WOOLLEY MANUFACTURING DIVISION, 1545 WHIPPLE ROAD S.W., CANTON, OHIO
(Name and address of NPT Certificate Holder)

(b) Manufactured for W. J. WOOLLEY CO., 4955 SPRING GROVE AVE., CINCINNATI, OHIO
(Name and addres of N Certificate Holder for completed nuclear component)

2. Identification-Certificate Holder's Serial No. Part P-2254 Nat'l Bd. No. N/A CRN No. N/A
(a) Constructed According to Drawing No. 73-1ELA-01 REV. 5 Drawing Prepared by W. J. WOOLLEY CO.
(b) Description of Part Inspected MODIFICATIONS TO AUXILIARY AIRLOCK
(c) Applicable ASME Code: Section III, Edition 1974 ; Addenda date WINTER 75 ; Case No. N/A Class MC

3. Remarks: WORK PERFORMED BY WOOLLEY MANUFACTURING DIVISION ON THE AUXILIARY AIRLOCK MANUFACTURED BY
(Brief description of service for which component was designed.)
MURDOCK, INC., COMPTON, CA. S/N MI 086. SEE PAGE 3 OF 3 FOR SCOPE OF WORK PERFORMED.

Item 4–8 inclusive to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers. N/A

4. Shell: Material -- (Kind & Spec. No.) T.S. -- (Min. of range specified) Nom. Thk. -- in. Corr. Allow. -- in. Diam. -- ft. -- in. Length -- ft. -- in.

5. Seams: Long -- H.T.[1] -- R.T. -- Efficiency -- %
Girth -- H.T.[1] -- R.T. -- No. of Courses --

6. Heads: (a) Material -- T.S. -- (b) Material -- T.S. --

	Location (top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diam.	Side to Pressure (convex or concave)
(a)	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-

If removable, bolts used -- (Material, Spec. No., T.S., Size, Number) Other fastening -- (Describe or attach sketch)

7. Jacket Closure: -- (Describe as ogee and weld, bar, etc. If bar, give dimensions, if bolted, describe or sketch)

8. (a) Design Pressure[2] -- psi at -- °F (b) Min. Pressure-Test Temp. -- °F

Items 9 and 10 to be completed for tube sections. N/A

9. Tube Sheets: Stationary: Material -- (Kind & Spec. No.) Diam. -- (Subject to pres.) in. Thk. -- in. Attachment -- (Welded, bolted)
Floating: Material -- Diam -- in. Thk. -- in. Attachment --

10. Tubes: Material -- O.D. -- in. Thk. -- in. or gage Number -- Type -- (Straight or U)

Items 11–14 inclusive to be completed for inner chambers of jacketed vessels or channels of heat exchangers. N/A

11. Shell: Material -- (Kind & Spec. No.) T.S. -- (Min. of range specified) Nom. Thk. -- in. Corr. Allow. -- in. Diam. -- ft. -- in. Length -- ft. -- in.

12. Seams: Long -- H.T.[1] -- R.T. -- Efficiency -- %
Girth -- H.T.[1] -- R.T. -- No. of Courses --

13. Heads: (a) Material -- T.S. -- (b) Material -- T.S. --

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diam.	Side to Pressure (convex or concave)
(a) Top, bottom, ends	-	-	-	-	-	-	-	-
(b) Channel	-	-	-	-	-	-	-	-

If removable, bolts used (a) -- (b) -- (c) -- Other fastening -- (Describe or attach sketch)

14. (a) Design Pressure[2] -- psi at -- °F (b) Min. Pressure-Test Temp. -- °F

[1] If postweld heat-treated. [2] List other internal or external pressures with coincident temperature when applicable.
*Supplemental sheets in form of lists, sketches, or drawings may be used provided: (1) size is 8½ in. x 11 in.; (2) information in items 1 and 2 of this Data Report is included on each sheet; and (3) each sheet is numbered and number of sheets is recorded in item 3, *Remarks*.

(12/80) This form (E00040) may be obtained from the Order Dept., ASME, 345 E. 47th St., New York, N.Y. 10017

COF

Items below to be completed for all vessels where applicable.

15. Safety Valve Outlets: Number N/A Size N/A Location N/A

16. Nozzles:

Purpose (inlet, outlet, drain)	Number	Diam. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

17. Inspection Openings: Manholes: No. N/A Size N/A Location N/A
Handholes: No. N/A Size N/A Location N/A
Threaded: No. N/A Size N/A Location N/A

18. Supports: Skirt N/A (Yes or no) Lugs N/A (Number) Legs N/A (Number) Other N/A (Describe) Attached N/A (Where & how)

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code, Section III.

(The applicable Design Specification and Design Report are not the responsibility of the NPT Certificate Holder for parts. An NPT Certificate Holder for appurtenances is responsible for furnishing a separate Design Specification and Design Report if the appurtenance is not included in the component Design Specification and Design Report.)

Date 11 - 16, 19 84 Signed WOOLLEY MFG. DIV. (NPT Certificate Holder) By Gary S Rudolph

Certificate of Authorization Expires 6-16-84 * Certificate of Authorization No. N-1112
* EXPIRATION DATE EXTENDED TO 12-16-84 BY ASME

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable) N/A

Design information on file at ----

Stress analysis report on file at ----

Design specifications certified by ---- Prof. Eng. State ---- Reg. No. ----

Stress analysis report certified by ---- Prof. Eng. State ---- Reg. No. ----

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 OHIO and employed by H.S.B.I. & I. CO. of HARTFORD, CONNECTICUT have inspected the part of a pressure vessel described in this Partial Data Report on 11 - 16, 19 84 and state that, to the best of my knowledge and belief, the NPT Certificate Holder has constructed this part 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 part described in this Partial 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 11 - 16, 19 84

Dale A Morgan (Inspector's Signature) Commissions Ohio Comm. (National Board, State, Province and No.)

WMD S.O. #13402-N SOUTH TEXAS PROJECT UNIT #1

BECHTEL P.O. NO. 14924-C-0011
WMD S.O. NO. 13402-N
SECTION 2 PAGE 4 OF 5

BECHTEL
BIR

1. (a) MANUFACTURED AND CERTIFIED BY: WOOLLEY MANUFACTURING DIVISION
1545 WHIPPLE ROAD S.W.
CANTON, OHIO

(b) MANUFACTURED FOR: W. J. WOOLLEY CO.
4955 SPRING GROVE AVE.
CINCINNATI, OHIO

2. IDENTIFICATION - CERTIFICATE HOLDER'S SERIAL NO. PART P-2254

NAT'L BD. NO. N/A CRN NO. N/A

3. REMARKS: (CONTINUATION)

SCOPE OF WORK PERFORMED:

A. PERFORMED THE FOLLOWING WELDING
DWG. #73-1ELA-21 REV. 11 WELDS #5 THRU 8
DWG. #73-1ELA-40 REV. 4 WELDS #9 THRU 23
DWG. #73-1ELA-33 REV. 2 WELDS #31 THRU 38

B. SUPPLIED THE FOLLOWING MATERIAL
DWG. #73-1ELA-02 REV. 10 PC. #18, 22, & 40
DWG. #73-1ELA-04 REV. 9 PC. #17
DWG. #73-1ELA-07 REV. 5 PC. #1, 5, 7, & 15
DWG. #73-1ELA-08 REV. 8 PC. #27
DWG. #73-1ELA-22 REV. 9 PC. #11 & 12
DWG. #73-1ELA-25 REV. 6 PC. #33
DWG. #73-1ELA-29 REV. 9 PC. #36
DWG. #73-1ELA-30 REV. 9 PC. #33
DWG. #73-1ELA-31 REV. 9 PC. #39
DWG. #73-1ELA-36 REV. 6 PC. #31
DWG. #73-1ELA-43 REV. 2 PC. #1, 5, 7, & 15

C. DRILLED AND TAPPED TWO (2) HOLES 1/2"-13 UNC X 3/4" DEEP IN REACTOR END COLLAR (PC. #20-3) PER DRAWING #73-1ELA-20 REV. 10

D. PERFORMED WELD REPAIR PER MATERIAL AND WELD REPAIR REPORT #679

Gary S Rudolph 11-16-84

Dale A Morgan 11-16-84

BECHTE
606

FORM N-2 NPT CERTIFICATE HOLDERS' DATA REPORT FOR NUCLEAR PART AND APPURTENANCES*

As required by the Provision of the ASME Code Rules, Section III, Div. 1

1. (a) Manufactured by MURDOCK, INC., 15800 S. Avalon Blvd., Compton, CA 90220
(Name and address of NPT Certificate Holder)

(b) Manufactured for W.J. WOOLLEY CO., 7425 W. Lake St., River Forest, Illinois 60305
(Name and address of N Certificate Holder for completed nuclear components)

2. Identification-Certificate Holder's Serial No. of Part MI 086 Nat'l Bd. No. N/A

(a) Constructed According to Drawing No. 73-1ELA-01 Rev. 3 Drawing Prepared by W.J. Woolley Co.

(b) Description of Part Inspected Emergency Air Lock

(c) Applicable ASME Code: Section III, Edition 1974, Addenda date Winter 1975, Case No. N/A Class MC

3. Remarks: Emergency air lock for concrete containment vessel.
(Brief description of service for which component was designed)

Part not pressure tested by this manufacturer for Code acceptance.

See Attachment #1, 1 sheet.

NOTE: See amended data, Page 2 of 2.

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the NPT Certificate Holder for parts. An NPT Certificate Holder for appurtenances is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the component Design Specification and Stress Report.)

Date December 2 19 80 Signed MURDOCK, INC. By R. Chadwick
(NPT Certificate Holder)

Certificate of Authorization Expires January 5, 1982 Certificate of Authorization No. N-1290

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

Design information on file at BROWN & ROOT, INC., HOUSTON, TEXAS

Stress analysis report on file at W.J. WOOLLEY CO., RIVER FOREST, ILLINOIS

Design specifications certified by H.S. Cameron Prof. Eng. State Texas Reg. No. 26694

Stress analysis report certified by R.A. Maffei Prof. Eng. State Illinois Reg. No. 62-36083

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 or Province of California and employed by LMC** of Long Grove, Illinois have inspected the part of a pressure vessel described in this Partial Data Report on 12/2 19 80 and state that to the best of my knowledge and belief, the NPT Certificate Holder has constructed this part 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 part described in this Partial 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 12/2 19 80

Inspector's Signature Commissions Chicago 475 —
National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in items 1-3 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.

**Lumbermens Mutual Casualty Company

(10.77) This form (E00040) may be obtained from the Order Dept., ASME, 345 E. 47th St., New York, N.Y. 10017

COPY

FORM N-2 (back)

Items 4–8 incl. to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

4. Shell: Material SA516 Gr.70 (Kind & Spec. No.) T.S. 70,000 (Min. of Range Specified) Nominal Thickness 1/2 in. Corrosion Allowance N/A in. Dia. 5 ft. 6 in. Length 10 ft. 0 in.

5. Seams: Long Welded Butts H.T.[1] Yes R.T. Yes Efficiency 100 %

Girth Welded Butts H.T.[1] Yes R.T. Yes No. of Courses 2

6. Heads: (a) Material SA516 Gr. 70 T.S. 70,000 (b) Material SA516 Gr.70 T.S. 70,000

Location (Top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Shell Ends	Reactor 2" Outer 1"						55"	
(b) Doors	Reactor 2" Outer 2"						36"	

If removable, bolts used N/A (Material, Spec. No., T.S., Size, Number) Other fastening N/A (Describe or attach sketch)

7. Jacket Closure: N/A (Describe as agee and weld, bar, etc. If bar give dimensions, if bolted, describe or sketch)

8. Design pressure[2] 56.5 psi at 286 °F Drop Weight N/A Charpy Impact 20 ft-lb at temp. of -20 °F

Items 9 and 10 to be completed for tube sections

9. Tube Sheets: Stationary, Material N/A (Kind & Spec. No.) Dia. (Subject to pressure) Thickness in. Attachment (Welded, Bolted)

Floating, Material N/A Dia. Thickness in. Attachment

10. Tubes: Material N/A O.D. in. Thickness (inches or gage) Number Type (Str. or U)

Items 11–14 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

11. Shell: Material N/A (Kind & Spec. No.) T.S. (Min. of Range Specified) Nominal Thickness in. Corrosion Allowance in. Dia. ft. in. Length ft. in.

12. Seams: Long N/A H.T.[1] R.T. Efficiency %

Girth H.T.[1] R.T. No. of Courses

13. Heads (a) Material N/A T.S. (b) Material T.S.

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Top, bottom, ends								
(b) Channel								

If removable, bolts used (a) (b) (c) Other fastening (Describe or attach sketch)

14. Design pressure[2] N/A psi at °F Drop Weight Charpy Impact ft-lb at temp. of °F

Items below to be completed for all vessels where applicable.

15. Safety Valve Outlets: Number 0 Size Location None Supplied

16. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Dia. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
(See Attachment #1, 1 sheet)							

17. Inspection Openings: Manholes, No. 2 Size 36" Dia. Location Shell Ends [Doors Item 6(b)]
Handholes, No. 0 Size Location
Sight Glass Threaded, No. 2 Size 1/2 (a.x3/4" Thk. Location Shell Ends [1 each end]

18. Supports: Skirt No (Yes or No) Lugs 0 (Number) Legs 0 (Number) Other N/A (Describe) Attached N/A (Where & How)

[1] If Postweld Heat-Treated.
[2] List other internal or external pressure with coincident temperature when applicable.

FORM N-2 NPT CERTIFICATE HOLDERS' DATA REPORT FOR NUCLEAR PART AND APPURTENANCES*

As required by the Provision of the ASME Code Rules, Section III, Div. 1

1. (a) Manufactured by MURDOCK, INC., 15800 S. Avalon Blvd., Compton, CA 90220
(Name and address of NPT Certificate Holder)

(b) Manufactured for W.J. WOOLLEY CO., 1315 West 22nd St., Oak Brook, Illinois 60521
(Name and address of N Certificate Holder for completed nuclear component)

2. Identification-Certificate Holder's Serial No. of Part MI 086 Nat'l Bd. No. N/A

(a) Constructed According to Drawing No. 73-1ELA-01 Rev. 4 Drawing Prepared by W.J. Woolley Co.

(b) Description of Part Inspected Emergency Air Lock

(c) Applicable ASME Code: Section III, Edition 1974, Addenda date Winter 1975, Case No. N/A Class MC

3. Remarks: To accomodate an As Constructed Drawing Revision after date of original
(Brief description of service for which component was designed)
N-2 Form signatures, and to change address as noted in item 1. (b).

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the NPT Certificate Holder for parts. An NPT Certificate Holder for appurtenances is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the components Design Specification and Stress Report.)

Date Aug 12 19 82 Signed MURDOCK, INC. By W.B. Parker
(NPT Certificate Holder)

Certificate of Authorization Expires January 5, 1985 Certificate of Authorization No. N-1290

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

Design information on file at BROWN & ROOT, INC., HOUSTON, TEXAS

Stress analysis report on file at W.J. WOOLLEY CO., OAK BROOK, ILLINOIS

Design specifications certified by H.S. Cameron Prof. Eng. State Texas Reg. No. 26694

Stress analysis report certified by R.A. Maffei Prof. Eng. State Illinois Reg. No. 62-36083

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 or Province of California and employed by LMC** of Long Grove, Illinois have inspected the part of a pressure vessel described in this Partial Data Report on DEC - 2 19 80 and state that to the best of my knowledge and belief, the NPT Certificate Holder has constructed this part 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 part described in this Partial 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 Aug 12 19 82

Inspector's Signature Commissions CA 1256
National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in items 1-3 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at top of this form.

**Lumbermens Mutual Casualty Company

(10/77) This form (E00040) may be obtained from the Order Dept., ASME, 345 E. 47th St., New York, N.Y. 10017

PURCHASER
3° Murdock, Inc.
Compton, CA

LUKENS STEEL COMPANY
COATESVILLE, PA 19320
TEST CERTIFICATE

DATE 3-3-78 FILE 30-01-95
CONSIGNEE

MILL ORDER NO.	CONSUMER P.O.	
77072-10	22510-M	MP 3178 V_S

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

SA-516 Gr. 70 ASME Code Sect. II & III Sub NE 1974 Edition thru Winter 1975 Addenda N-1160 8/4/78

BLOW TEST NON-DESTRUCTIVE TEST

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B
C9044	.24	1.07	.011	.022		.26							

Grain Size
7-8

NUCLEAR

PNPP
UNITS 1&2
CEI P 1251 L

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI 0.2%	TENSILE PSI	% ELONG IN 2"	AREA	XXX / XXX	IMPACTS V-Notch -20°F.			Fracture Appearance % Shear
						Loc.				
C9044	2	460	766	30		T	22	20	22	20-20-20
						L	28	32	29	30-30-30
						Lateral Expansion in Inches				
						T	.017	.018	.019	
						L	.027	.025	.030	

DESCRIPTION
1 - 3" x 150 x 200

MURDOCK INC.
LOT # A2841O
3-3007-05
JOB # WO 3-3008-05
DATE 3-16-78

1 PC 3 X 160 X 200

Verified records from continuous furnace show that this plate and tests were normalized 1625-1675°F., held 1/2 hr. per inch min. and air cooled.

Tests stress relieved by heating within a rate of 100°F. per hr. to 1100-1150°F., held 15 hrs. and furnace cooled within a rate of 100°F. per hr. to 800°F.

SEP 0 0 1990

DEC 1 5 1978

We hereby certify the above information is correct.

A.I. REVIEW

SUPERVISOR TESTING

COPY

LOS ANGELES

EARLE M. JORGENSEN CO.

STEEL
FORGE DIVISION
10650 SO ALAMEDA STREET • PHONE 567-1122 (Area Code 213)
MAILING ADDRESS P O Box 54633
LOS ANGELES, CALIFORNIA 90054

DELIVERY RECEIPT
TEST REPORT

INVOICE NO. 4283 FL

INVOICE NO.
SHIPPED 1-15-80
TYPED BY GILDA TIME

4283 FL OK

CUSTOMER ORDER - REQ. NO.	DATE ENTERED	CHK'D BY	ORDERED BY
31682 M	11/12/79	SOT	BILL STOLL 770-0220

SOLD TO:
2-158140-1
MURDOCK INC
P O BOX 4249
COMPTON CA 90224

SHIP TO:
SAME
15800 SO AVALON

SHIP VIA: OUR TRUCK	WILL CALL	CARRIER	FOB	DEST. FREIGHT PPD.	OUR PLANT FREIGHT COLL.	O.P. PREPAID CHARGE FRT.	O/P COLLECT ALLOW FRT.
X		COOK		X			

QUANTITY AND DESCRIPTION	WEIGHT	HEAT NO.
SA-350 LF-2 ASME SECT III, DIV 1 SUBSECTION NE CL-MC AND SUBSECTION NA, PARA NA-3767-4B/NA 3767-5 1974 EDITION WITH WINTER 75 ADDENDA FORGED OVERSIZE TO ALLOW FOR FINISH NORMALIZED QUENCHED AND DRAWN SAW CUT ENDS BLUE RED AND YELLOW 21106	MAR 19 19__	
8 PCS 6 RD X 4-1/2 BHN 153 ON 1 PALLET	408# 25#	302-215812
MECHANICAL TESTING INCLUDED IN PRICE TOTAL WEIGHT	433#	

FOR DOCUMENT REVIEW 05

WJW 04

NUCLEAR

BAY 9

73-1-2 ELA-108 13

N. Q&T

CERTIFIED TEST REPORT

We certify that the material covered by this report has been inspected and tested in accordance with the applicable requirements described herein and test results are on file subject to examination.

By *[signature]*
TEST REPORT CLERK

SUBSCRIBED AND SWORN TO BEFORE ME THIS
15 DAY OF JANUARY 19 80
[signature]
NOTARY PUBLIC

OFFICIAL SEAL
MICHAEL MORRIONE
NOTARY PUBLIC CALIFORNIA
LOS ANGELES COUNTY
My Commission Expires June 23, 1982

NUCLEAR ORDERS ONLY
ASME Quality System Certificate Number N 1707
Expires APRIL 15, 1980
[signature] 1-16-80

HEAT NO.	YIELD	TENSILE	ELONG. % IN INCHES	% RED. IN AREA

MURDOCK INC.
LOT A 45497
WJW 3-300 6/01
1-18-80

MECHANICAL CERTS ATTACHED.

C	MN	P	S	SIL	NI	CR	MO	V	CU	G/S	MILL	HEAT NO.
.25	1.23	.011	.016	.20						6/7	SHARON	215812

HARDENABILITY — ROCKWELL "C": 1	4	5	8	10	16	20	32

HEAT TREAT CERTS ATTACHED

A.I. REVIEW *[signature]* 1/22/80

COPY

COPY

FORM 80 FL F&M 3 78

EARLE M. JORGENSEN CO.

STEEL

FORGE DIVISION

10650 S. ALAMEDA ST. • BOX 54633 (TERMINAL ANNEX) • PHONE 567 1122 (AREA 213)

LOS ANGELES, CALIFORNIA 90054

CERTIFIED TEST REPORT

Date 1-15-80

Cust. Order No. 31682-M

Our Invoice No. 4283-FL

Material SA 350 LF-2

Specification ASME SECT III, DIV 1 SUBSECTION NE CL MC & AND SUBSECTION NA, PARA NA 3767-4B/NA 3767-5 1974 EDITION WITH SINTER 75 ADDENDA

MURDOCK INC
COMPTON CA

ITEM 8 PCS 6" RD X 4-1/2

MECHANICAL PROPERTIES

HEAT NO	DIRECTION OF TEST	YIELD PSI	ULTIMATE PSI	ELONG % 2"	RED OF AREA %	IMPACTS FT LBS	% SHEAR	LAT EXP
1D2-215812	LONG	49400	70600	33	73.6	72 70 58		
REQUIREMENTS		36000	70/95000	22	30	15 AVG.		

PSU DOCUMENT FILE #5

A.I. REVIEW Lee 1/22/80

NUCLEAR

MAR 19 1980

WJW 04

Remarks: CHARPY V NOTCH @ MINUS 20 DEG'S F.

73-1-2 ELA-10 & 13

MURDOCK INC.
WO # 194-5447
WO # W06 3-3008-06-07
DATE 1-18-80

SUBSCRIBED AND SWORN TO BEFORE ME

THIS 15 DAY OF JANUARY 19 80

NOTARY PUBLIC

STATE OF CALIFORNIA LOS ANGELES COUNTY

MY COMMISSION EXPIRES

OFFICIAL SEAL
FLORENCE REESE
NOTARY PUBLIC CALIFORNIA
LOS ANGELES COUNTY
My Comm. Expires Apr 26, 1983

WITNESSED BY

We certify that the material covered by this report has been inspected and tested in accordance with the applicable requirements described herein and test results are on file subject to examination

EARLE M. JORGENSEN CO.

BY Rod Bratton

COPY

EARLE M. JORGENSEN CO.

FORGE DIVISION

CERTIFICATION OF HEAT TREATMENT

CUSTOMER Murdock Inc.
ADDRESS Compton, Calif.

MURDOCK INC.
LOT # A45497
JOB # WOL 3-3002-06-07
L-18.80

DATE 12 20 74

73-1-2 ELA 10 21 3

THIS IS TO CERTIFY THAT YOUR MATERIAL SHOWN BELOW WAS PROCESSED AS FOLLOWS:

PURCHASE ORDER NO.	OUR FO NO.	MATERIAL GRADE	DESCRIPTION
31682 M	4283 FL	LF-2	6" ϕ x 4½"
PART NUMBER		QUANTITY	
		8 + Test	HEAT NO. 1D2-215812

TREATMENT	TEMPERATURE	TIME AT TEMPERATURE	COOLING METHOD	RESULTS
NORMALIZE	1650° F	8 HOURS	AIR	26-317-79
[illegible] QUENCH	1550° F	8 HOURS	WATER	26-314-79
STRESS RELIEVE OR TEMPER	1300° F	8 HOURS	AIR	26-321-79

REMARKS

MAR 19 1981

NUCLEAR

OFFICIAL SEAL
FLORENCE REESE
NOTARY PUBLIC - CALIFORNIA
LOS ANGELES COUNTY
My Commission Expires Aug. 20, 1983

A.I. REVIEW Lic 1/22/80

SUBSCRIBED AND SWORN TO BEFORE ME
THIS 15 DAY OF JANUARY 19 80

NOTARY PUBLIC
STATE OF CALIFORNIA, LOS ANGELES COUNTY

MY COMMISSION EXPIRES

EARLE M. JORGENSEN CO.

BY

Form 32-F

Penetration Sleeves

W6B/37EA/jj

20" S/80 Gr 6

USS ~~United States Steel Corporation~~

National WORKS

STANDARD SWORN TEST REPORT
TUBULAR PRODUCTS

3-17-76 DATE

MATERIAL: Seamless Pressure Pipe

GRADE: 6 ASME SA333
6 ASTM A333

TREATMENT: Normalized 1600°F for 128 minutes (Aircooled)

CUSTOMER: NAME: Capitol Pipe and Steel Products, Inc.
ADDRESS:

CUSTOMER'S ORDER NO.: 77223-00

U.S. STEEL ORDER NO.: KC 18185

INVOICE NO.: 356-00777 - 356-00779

Longitudinal tensile tests

ITEM NO.	COIL OR LOT NO.	SIZE O.D.	NOMINAL WALL THICKNESS		HEAT NUMBER	HYDRO. TEST PRESSURE MIN. P.S.I.	MECHANICAL PROPERTIES: YIELD STRENGTH P.S.I.	TENSILE STRENGTH P.S.I.	ELONG. IN 2" 1½"	CHEMICAL ANALYSIS (%): C	Mn	P	S	Si	Mo	
01	5032	20"	1.031		A20385	2200	45560	69820	52.5	.19	1.07	.017	.011	.18	check	
					A20385	2200	46700	70630	50.0	.19	1.10	.018	.009	.18	check	
										.17	1.08	.014	.010	.18	ladle	

Penetration
E-23
E-24

Flattening Tests Satisfactory

Full size longitudinal Charpy V-Notch impacts at minus - 50°F

	Ft. Lbs.	% Shear	Lat. Exp.
A20385	34	36	.034
	50	39	.047
	42	30	.040

COPY

THIS REPORT HAS BEEN CHECKED AND FOUND TO COMPLY WITH APPLICABLE SPECIFICATION.
Date 3-23-76 By A. Roberts

Pittsburgh Des-Moines
P.O.# 15679-229
S.O.# DN-5489-A
Ch# P-33475

Item# 6

STATE OF } ss
COUNTY OF }

BEING DULY SWORN ACCORDING TO LAW DEPOSES AND SAYS THAT THE FIGURES SET FORTH ABOVE ARE JUST AND CORRECT AS CONTAINED IN THE RECORDS OF THE COMPANY.

SUBSCRIBED AND SWORN TO BEFORE ME THIS 17th DAY OF March 19 76

NOTARY PUBLIC

MY COMMISSION EXPIRES

6 8 0 5 3 5 0 0 0 1

BC 8-20-76

PURCHASER:
PITTSBURGH-DES MOINES STEEL CO.
MR. JACK MCCARTHY
NEVILLE ISLAND
PITTSBURGH, PA. 15225

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320

TEST CERTIFICATE

ID - A2774 THRU ID - A2777

DATE: 6/15/76 FILE NO. 6568-03-06

CONSIGNEE:
PGH-DES MOINES STEEL CO
NEVILLE ISLAND
PENNSYLVANIA 15225

MILL ORDER NO.	CUSTOMER P.O.	
70758 1	11-15679-616	61176 JW

Mech Main steam line sleeve. M1 to M4.

MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S):

XXXXXXXXXXXXXXXXXXXXXXXX PDS MS 7.29.2 REV. 0 SA-516 GR. 60 ASME CODE SECTION II & III SUB NB 1971 EDITION THRU WINTER 1973 ADDENDA AND PROPOSED SECT III DIV. 2 DTD 4/73 N-1160 8/4/78

END TEST O.K. HOMOGENEITY TEST

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B		GRAIN SIZE
A5280	.13	.93	.006	.020		.19									7-8

THIS REPORT HAS BEEN CHECKED AND FOUND TO COMPLY WITH APPLICABLE SPECIFICATIONS

15679
15680

Signed J.A. Bednarski Date 6-29-76

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 2	% R.A.	BHN	IMPACTS LU	IMPACTS 0 F		FRACTURE APPEARANCE % SHEAR	DESCRIPTION
											I.D. A2775
A5280	2	463	632	35			138	140	140	99-99-99	1- 2-1/2 X 112 X 390 Item (1)
					LATERAL EXPANSION IN INCHES		.097	.098	.098		
											A2777
A5280	4	470	640	34			100	98	96	90-90-90	1- 2-1/2 X 107 X 390 Item (2)
					LATERAL EXPANSION IN INCHES		.094	.093	.092		
											A2776
A5280	3	475	655	30			186	200	220	99-99-99	1- " Item (3)
					LATERAL EXPANSION IN INCHES		.099	.099	.099		
											A2774
A5280	1	480	640	33			168	170	164	99-99-99	1- 2-1/2 x 112 x 390 Item (4)
					LATERAL EXPANSION IN INCHES		.094	.096	.097		

Plates and tests norm. 1625°F./1675°F., hold 1/2 hr. per inch min., and air cooled.
Tests stress relieved by heating within a rate of 160°F. perhr. to 1100°F./1150°F., hold 9 hrs. and furnace cooled within a rate of 160°F. per hr. to 600°F.

We hereby certify the above information is correct. ID - A2774 THRU ID - A2777 INSPECTOR TESTING

PGA-1480

PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

850 POPLAR STREET, PITTSBURGH, PA. 15220

AREA CODE 412 TELEPHONE 922-4000

FOR INFORMATION ONLY

A-209

PLEASE REPLY TO:
P. O. BOX 1646
PITTSBURGH, PA. 15230

LABORATORY No. 767420

ORDER No. PG-15672

CLIENT'S No. 11-00000-47206 E-8

REPORT

DATE: 8/10/76

Report of: Charpy Impact Test
"V" Notch, Plus 20°F

Report to: Pittsburgh Des-Moines Steel Corporation
Neville Island
Pittsburgh, Pennsylvania 15225

Code #8

Specimen Identification	Size of Specimen	Shear %	Cleavage %	Lateral Expansion Inches	Impact Foot Pounds
Pc. No. 137-H2 A2776	10.00x10.00	5	95	.047	51
Pc. No. 137-H2 A2776	10.00x10.00	10	90	.050	61
Pc. No. 137-H2 A2776	10.00x10.00	5	95	.044	46

Specimens were removed .025" to .030" below outer surface of the plate.

Material: ASME SA516 Gr. 60
Thickness: 2½"
PWHT - 9 Hrs. Hold at 1100°F
Pc. No. - 137-H2=8
I. D. - A2776=8
Contract: 15679

SAMPLES SUBMITTED BY THE CLIENT FOR MACHINING AND TESTING.

PITTSBURGH TESTING LABORATORY

Earl Gallagher

Earl Gallagher, Manager
Physical Testing Department

cc: 3- client
mls

APPROVED

D. L. Fisher-Proj. Engr.

PITTSBURGH TESTING LABORATORY

ESTABLISHED 1851

850 POPLAR STREET, PITTSBURGH, PA. 15220

PLEASE REPLY TO:
P. O. BOX 1646
PITTSBURGH, PA. 15233

AREA CODE 412 TELEPHONE 922-4000

Form 407 REV.-PG

LABORATORY No. 764677

CLIENT'S No. 15679-226A

ORDER No. PG-15672

REPORT

DATE: 6-2-76

Report of : Tensile, Impact and Flattening Test of SA106 Grade B Pipe

Report to : Pittsburgh Des-Moines Steel Company
Neville Island
Pittsburgh, Pennsylvania
Attn: J. Billisits

TENSILE TEST

Specimen Identification	Ht. N12979
Diameter In Inches	.504
Original Area Sq. In.	.1995
Yield Strength Pounds	6,910
Yield Strength PSI	34,600
Maximum Load Pounds	13,700
Tensile Strength PSI	68,700
Elongation in 2 Inches	.68
Elongation Per Cent	34.0
Reduced Diameter	.305
Reduced Area Sq. In.	.0731
Reduction of Area Per Cent	63.4
Location of Fracture	M/3

YIELD STRENGTH DETERMINED AT 0.2% OFFSET.'

COPY

CHARPY IMPACT TEST
"V" Notch. 0°F

SPECIMEN IDENT.	SIZE OF SPECIMEN	SHEAR %	CLEAVAGE %	LAT. EXP. INCHES	IMPACT FT. LBS.
N12979	10MMx10MM	10	90	9	8
N12979	10MMx10MM	10	90	11	10
N12979	10MMx10MM	10	90	13	11

THIS REPORT HAS BEEN CHECKED AND FOUND TO COMPLY WITH APPLICABLE SPECIFICATION.

Date 1-17-77 By RK

PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

850 POPLAR STREET, PITTSBURGH, PA. 15220

PLEASE REPLY TO:
P. O. BOX 1646
PITTSBURGH, PA. 152

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 764677

ORDER No. PG-15672

CLIENT'S No. 15679-226A

REPORT

DATE: 6-2-76

FLATTENING TEST

A portion of the sample was flattened and revealed no rejectable defects.

Material : SA106 Grade B-24" OD Schedule 60
Heat Treatment: Normalized by Pittsburgh Metal Processing Co. Inc.
Penetration No: M-21
Heat No. N12979
Contract 15679

Lab. No. 764677A
RETEST

TENSILE TEST OF STEEL

Specimen Identification	As Recieved	Nomalized
Diameter In Inches	.508	.508
Original Area Sq. In.	.2027	.2027
Yield Strength Pounds	7,890	9,500
Maximum Load Pounds	14,200	14,450
Yield Strength PSI	38,950	46,850
Tensile Strength PSI	70,050	71,300
Elongation in Inches	.66	.69
Elongation Per Cent	33.0	34.5
Reduced Dia.	.310	.304
Reduced Area	.0755	.0726
Reduction of Area Per Cent	62.8	64.1
Location of Fracture	M/3	M/3

YIELD STRENGTH DETERMINED AT 0.2% OFFSET.

COPY

THIS REPORT HAS BEEN CHECKED AND FOUND TO COMPLY WITH APPLICABLE SPECIFICATION.

Date 1-17-77 By BL

9 9 0 5 8 5 0 0 0 1

Flued Heads

W6B/37EA/jj

GW **Taylor Forge Engineered Systems**

P.O. Box 9
Paola, KS 66071
913/294-5331

CUSTOMER Bechtel Energy Corporation

South Texas Project Electric Gen. Station

SPECIFICATION NO. ASME Section III CL2 S76; Fab. Per MPS-E6

HEAT TREATMENT See attached CMTR's

CUSTOMER ORDER NO. 35-1197-4036

OUR ORDER NO. 802185

TFES Item No. 26A, Penetration No. M-5

PACKING LIST NO.

CERTIFIED MATERIAL TEST REPORT

The finished product shown was produced in the U. S. A.

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s).

Certificate N-1936

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ____% OFFSET PSI	PHYSICAL PROPERTIES: TENSILE STRENGTH PSI	PHYSICAL PROPERTIES: ELONG IN ____ %	PHYSICAL PROPERTIES: RED OF AREA %	CHEMICAL ANALYSIS: C	Mn	P	S	Si	Mo	Cr	Ni	DESCRIPTION
KLHK					See attached CMTR from National Forge Company								Forged Cyl. 11' x 4 1/4" long SA-350-LF2

REMARKS:

Pen. Tag No. (Unit 1) 2C091NPN005A
P.T. per Q.S.P. 4.4.2 Rev. 6 - Acceptable
Repair per NMR 001462 Attached

BECHTEL 655

GW011

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____ 19____

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager.

RIP#3117

COPY

FORM NO 1056 B

NATIONAL FORGE COMPANY
QUALITY CONTROL DEPARTMENT

MATERIAL CERTIFICATION REPORT NO. 0- 03444

NFC SHOP NO. 60-5908 SERIAL NO. 01-001,002 2uA 2uB
CUSTOMER ~~GULF & WESTERN~~
CUSTOMER ORDER NO. 20367-P

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Ni	Cr	Mo	V	Al	Cu	Co	Ti
4-7988	.20	1.21	.014	.008	.22	.22	.28	.06	.04		.07	.006	
CHECK	.21	1.23	.014	.008	.21								

MECHANICAL PROPERTIES

LEGEND	SPECIMEN IDENT NO.	TENSILE psi	YIELD psi @ .2	%ELONG	%R/A	GRAIN SIZE	HARDNESS
L = LONG	01-001,002 L	76,100	50,700	31.0	70.1	9-11	149-156-156
R = RAD							
X = TRAN							
Y = TANG							

MANUFACTURING NOTES AND HEAT TREATMENT DATA

OPERATION	TO °F	HRS HOLD
AUSTENITIZED	1550	14
QUENCHED IN WATER		
AUSTENITIZED	1460	14
QUENCHED IN WATER		
TEMPERED	1180	7
NORMALIZED	1680	14

The Materials used on this order were manufactured and tested in accordance with Quality Control System audited and approved by Gulf and Western on 10/25/77

IMPACT DATA

SPCMN. IDNT. NO.	°F	FT. LBS.	%SHEAR	LATERAL EXPANSION
L	-50	61.0	20	.047
	-50	64.0	20	.051
	-50	23.0	18	.018
L	+40	179.0	100	.070
	+40	157.0	100	.081
	+40	217.0	100	.077
L	+40	236.0	100	.070
	+40	225.5	100	.071
	+40	211.0	100	.087

REVIEW
DATE
INITIAL FINAL

ULTRASONIC INSPECTED PER APPROVED PROCEDURE AND FOUND TO BE SATISFACTORY WITH NO REPORTABLE INDICATIONS

MAGNETIC PARTICLE INSPECTED PER

BENTEL 655

ANGELES INGLEWOOD

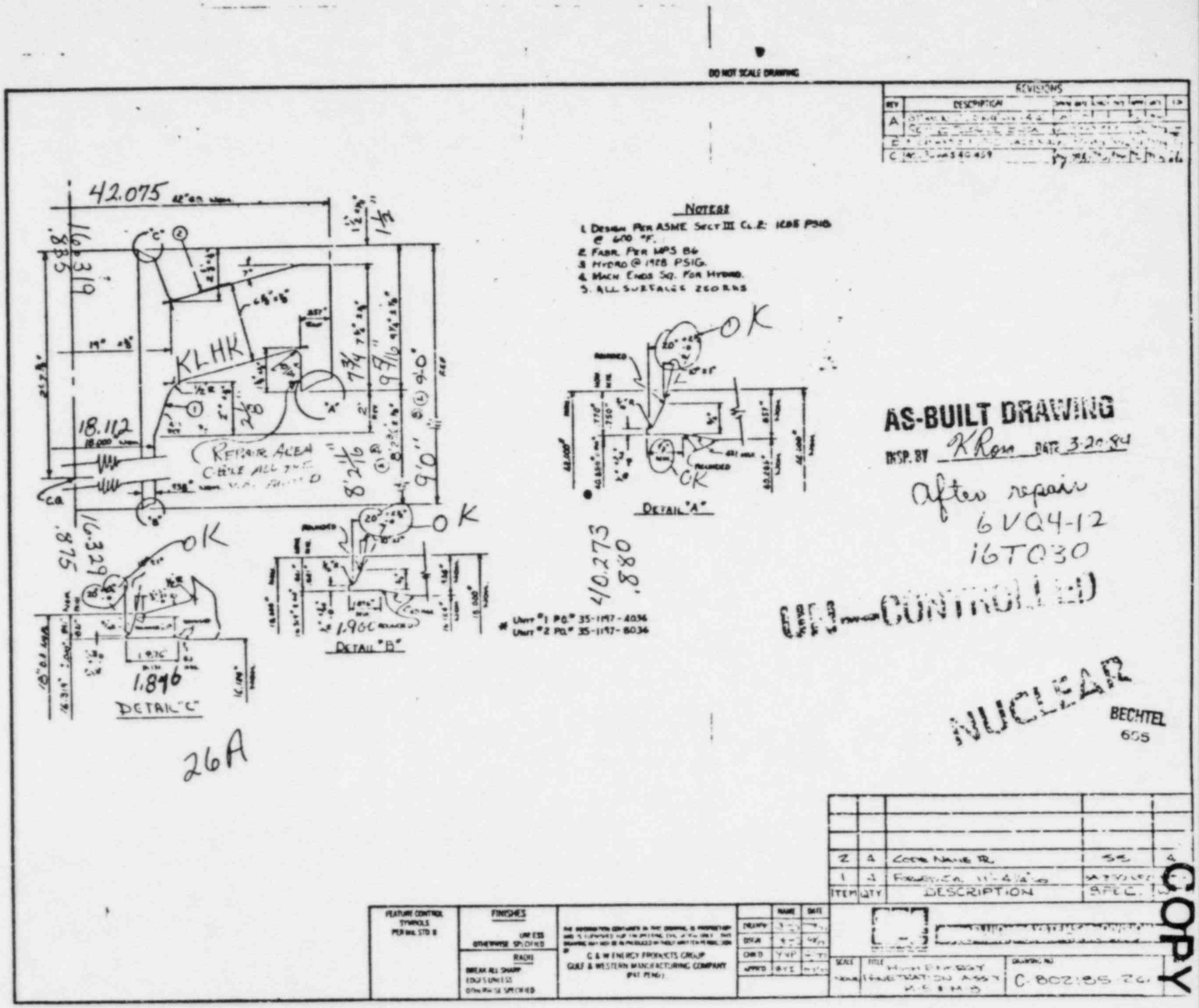
Released C-D MAR - 9 1983 IFLS 16

TENSILE SPECIMEN SIZE = .505"
ROUND FLUTED INGOT MOLD
FREE OF MERCURY CONTAMINATION

COPIES OF ACTUAL TEST DATA AVAILABLE FOR REVIEW

RIP#31117

COPY


DO NOT SCALE DRAWING
REVISIONS
Notes:
1. Design Per ASME Sect III Cl. 2: 1285 PSIG @ 600 °F.
2. Fabr. Per MPS B6
3. Hydro @ 1928 PSIG.
4. Mach Ends Sq. For Hydro.
5. All Surfaces 250 RMS
Detail "A"
Detail "B"
Detail "C"
Unit #1 P.O. 35-1197-4036
Unit #2 P.O. 35-1197-8036
Repair Area
KLHK
42.075
16.319
.885
18.112
16.329
.875
1.906
1.896
40.273
.880
OK
26A
AS-BUILT DRAWING
INSP. BY KRen DATE 3-20-84
After repair
6VQ4-12
16T030
UN-CONTROLLED
NUCLEAR
BECHTEL
655
COPY
DESCRIPTION
SPEC.
G & W ENERGY PRODUCTS GROUP
GULF & WESTERN MANUFACTURING COMPANY
FINISHES
RADII
FEATURE CONTROL SYMBOLS

RIP#3117

GW **Taylor Forge Engineered Systems**

P.O. Box 8
Paola, KS 66071
913/294-6331

CUSTOMER Bechtel Energy Corporation

South Texas Project Electric Gen. Station

CUSTOMER ORDER NO. 35-1197-4036

PACKING LIST NO. _____

The finished product shown was produced in the U.S.A.

SPECIFICATION NO. ASME Section III CL2 S76; Fab. Per MPS-86

HEAT TREATMENT See attached CMTR's

OUR ORDER NO. 802185

TFES Item No. 25A, Penetration No. M-1

CERTIFIED MATERIAL TEST REPORT

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s)

Certificate N-1936, Exp. 11/25/86

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ____% OFFSET PSI	TENSILE STRENGTH PSI	ELONG IN ____" %	RED OF AREA %	CHEMICAL ANALYSIS: C	MN	P	S	SI	MO	CR	NI	DESCRIPTION
KLWV					See attached CMTR from National Forge Company								Forged Cyl. 11'-0" long SA-350-LF2

RIP # 4060

BECHTEL 655

NUCLEAR

REMARKS: Pen. Tag No. (Unit 1) 2C091NPN001A
P.T. per E.S. 3.12.3 Rev. 0 - Acceptable

GW011

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____ 19____

_____
NOTARY PUBLIC

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager.

_____

COPY

COPY

FORM NO 1175

NATIONAL FORGE COMPANY

* CORRECTED 9-14-79

MATERIAL NOTARIZATION DOCUMENTATION PACKAGE

Customer: GULF & WESTERN ENERGY COMPANY

Forge Div. Irvine ☐ Erie ☒

Purchase Order No.: [redacted]-0622

Foundry Div. ☐

Drawing No.: 802185-25-A1, Rev. 0

NFC Order No.: 61-A-5882-01

Nomenclature: Tubular Product

NFC Serial No.: 001

Specification: ASME SA-350 LF2, 1974 Edition with Addenda thru Summer 1976, Subsection NC for Class 2 Components. Charpy V-notch per NC-2330 at +40°F.

NATIONAL FORGE COMPANY DOCUMENTS APPROVED AND USED ON THIS CONTRACT

PAOLA

Released Q.C. SEP 18 1979 ESOP 16

Ultrasonic Procedure:
Magnetic Particle Procedure:
Heat Treat Procedure:
Impact Test Procedure:
Forging Test Drawing:
Other:

802185

Item 25A *

DOCUMENTATION PACKAGE TABLE OF CONTENTS

3	Chemistry/Mechanical/NDT Data		Photomicrographs
	Transition Curve		Test Material (Sep. Cover)
	Heat Treatment Charts/Table IV Form		U-1A Form
	Dimensional Data		U-2 Form
	Forging Material Log		Other
	Heat Stability Data	3	Heat Treatment

KWV

NUCLEAR

A. N. I. REVIEW BY [illegible] INITIAL DATE 8/1-84 FINAL

COMMONWEALTH OF PENNSYLVANIA,)
COUNTY OF) ss.:

R. L. Hofer an authorized representative of National Forge Company, being duly Sworn, deposed and says that the inspection and test results set forth in the attached reports and documentations are correct copies of results of inspection and tests made by the company and recorded in its records.

R. L. Hofer

BECHTEL 685

Erie, Erie County, Pennsylvania
Notary Public Seal
My Commission Expires July 25, 1981
LENA FILIPPO

Subscribed and sworn to before me this 20 day of August 1979

Lena Filippo
NOTARY PUBLIC

RIP # 4060

FORM NO. 1056 E

NATIONAL FORGE COMPANY
QUALITY CONTROL DEPARTMENT

MATERIAL CERTIFICATION REPORT NO. 0- 05957

NFC SHOP NO. 61A-5882-01 SERIAL NO. 001
CUSTOMER GULF & WESTERN ENERGY
CUSTOMER ORDER NO. 12-0622

Page of

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Ni	Cr	Mo	V	Al	Cu	Co	Ti						
21-4675	.30	1.15	.010	.014	.27	.25	.12	.06	.04										
R 12:00	.30	1.33	.010	.014	.28	.28	.14	.07	.04										

MECHANICAL PROPERTIES

LEGEND	SPECIMEN IDENT. NO.	TENSILE psi	YIELD psi @ .2	% ELONG	% R/A	GRAIN SIZE	HARDNESS
L = LONG	L	73,500	47,500	34.5	68.3		12:00 177
R = RAD							3:00 171
X = TRAN							6:00 177
Y = TANG							9:00 177

MANUFACTURING NOTES AND HEAT TREATMENT DATA

OPERATION	TO °F	HRS HOLD
N.	1700	15
Air cool		
Water quench (All)	1550	15
Water quench	1460	15
Air cool (1 Each)	1190	15
Air cool	1210	15
Air cool	1220	15
Air cool	1220	10

PNSR 802185

SEP Released 8 4979 ESD-P 16

Item 23A

KLWV

NUCLEAR

TENSILE SPECIMEN SIZE = .505"
ROUND FLUTED INGOT MOLD
FREE OF MERCURY CONTAMINATION

IMPACT DATA

SPCMN. IDNT. NO	°F	FT. LBS	% SHEAR	LATERAL EXPANSION
L	+40	80.0		.062
L	+40	64.0		.054
L	+40	44.0		.043
L	+40	69.0		.052
L	+40	81.0		.063
L	+40	75.0		.055
L	+40	91.0		.067
L	+40	81.0		.065
L	+40	65.0		.057

ULTRASONIC INSPECTED PER UT-61-A-5882
No reportable indications

MAGNETIC PARTICLE INSPECTED PER

A. N. I. REVIEW
BY [signature] DATE 10-1-87
☒ INITIAL ☐ FINAL

BECHTEL 655

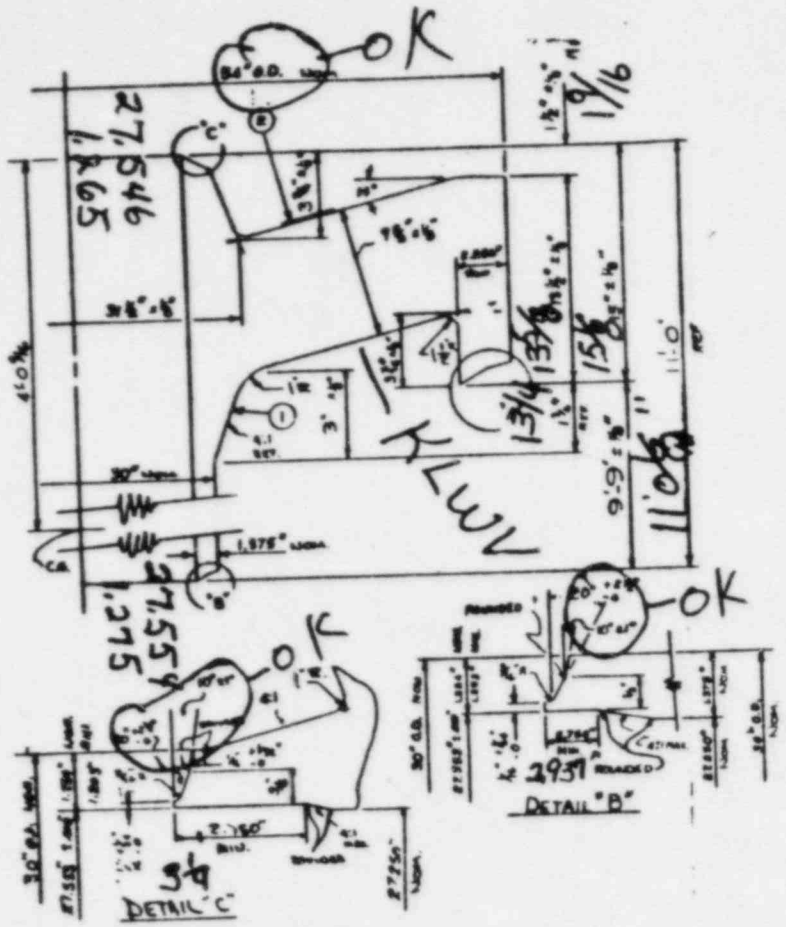
COPIES OF ACTUAL TEST DATA AVAILABLE FOR REVIEW

RIP # 4060

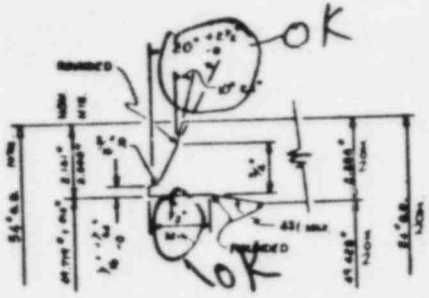
COPY

DO NOT SCALE DRAWING

REVISIONS							
REV	DESCRIPTION	DRWN	DATE	CHKD	DATE	APPD	DATE	ECN
A	[illegible]							
B	[illegible]							
C	DELETED HYDRO							X



NOTES:
1. DESIGN PER ASME Sect. III Cl. 2 1285 PSIG @ 600 °F.
2. FABR. PER WPS B6
3.
4. MACH. ENDS SQ. FOR HYDRO.



* UNIT "1 P.O." 35-1197-4036
UNIT "2 P.O." 35-1197-8036

47.712
2.210

AS-BUILT DRAWING
MKD. BY K Ros DATE 7/27/84

25A

BECHTEL
655

NUCLEAR
~~GTD~~ K.R.
60TQ2
6VQ4-12
16TQ29

RIP # 406

ITEM	QTY	DESCRIPTION	SPEC.	WT.
2	4	CODE NAME FR	SS	4
1	4	FORGED CYL 14'-0" LG	SA 350 LF2	49.052

FEATURE CONTROL SYMBOLS PER MIL STD 8	FINISHES UNLESS OTHERWISE SPECIFIED: RADII BREAK ALL SHARP EDGES UNLESS OTHERWISE SPECIFIED	THE INFORMATION CONTAINED IN THIS DRAWING IS PROPRIETARY AND IS FURNISHED FOR INFORMATION ONLY. NOT TO BE REPRODUCED OR USED WITHOUT THE PERMISSION OF G & W ENERGY PRODUCTS GROUP GULF & WESTERN MANUFACTURING COMPANY (PAT PEND)		NAME	DATE
			DRAWN		
			DSGN		
			CHK'D		
			APP'D	R.V.I	

FLUID SYSTEMS DIVISION

SCALE	TITLE	DRAWING NO	REV
NONE	HIGH ENERGY PENETRATION ASSY M-1 & M-4	C-802185-25	-

COPY

Cap Type Penetrations

W6B/37EA/jj

COPY

CORRECTED REPORT 8-5-83 C. Massey

GW **Taylor Forge Engineered Systems**

P.O. Box B
Paola, KS 66071
913/294-5331

CUSTOMER South Texas Project

SPECIFICATION NO. ASME Section III Class 2 Summer 76

HEAT TREATMENT *KLSL Normalize temp. 1700°F ± 25°F. with hold time at temp. (1) hr/inch

CUSTOMER ORDER NO. 35-1197-4036

OUR ORDER NO. 802185 - 20A

YOUR PENETRATION NO. M-33 Unit #1

PACKING LIST NO. 02322

CERTIFIED MATERIAL TEST REPORT

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s)

The finished product shown was produced in the U.S.A.

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ____ % OFFSET, PSI	PHYSICAL PROPERTIES: TENSILE STRENGTH PSI	PHYSICAL PROPERTIES: ELONG IN ____" %	PHYSICAL PROPERTIES: RED OF AREA %	CHEMICAL ANALYSIS: C	MN	P	S	SI	MO	CR	NI	DESCRIPTION
	ITEM # 20A				STP# 2C091NPN033A								
* KLDX	43,300	68,200	37.5		.24	.67	.005	.017	.16	SA-106-B			16" Standard Pipe x 6'-4-1/2" long
			*UT Pipe per NC-2552 - Acceptable										
* KLSL	49,400	76,400	2" 28	.	.22	1.04	.201	.020	.224	SA-420-WPL6			24" OD x 1-7/16" minimum 2:1 S.E.
TFES Testing	48,004	75,291	32	58.1	Charpy V+40°F Ft. Lbs. 34-31-33								HD 2" S.F.
					MLE: 39-39-39								
					% Shear 85-80-85								

REMARKS: Fabricated per MPS B3 R/O 3-7-77 - Acceptable
Hydrotested per MPS C7 and ES 3.16.1 R/O 12-8-76 at 225 PSIG - Acceptable
PT Welded joint per ES 3.12.2 R/3 9-13-76 & Amend. 2 R/O 1-20-77 - Acceptable

* SEE VENDOR CERTIFICATION

GW011

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____ 19____

NOTARY PUBLIC

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager.

[redacted]

COPY

BETHLEHEM STEEL CORPORATION
METALLURGICAL DEPARTMENT
REPORT OF TESTS AND ANALYSES attn: R. L. Miller

BURNS HARBOR PLANT

SHIPMENT NO.	DATE SHIPPED	CAR OR VEHICLE NO.	PAGE
803-08969	4-26-78		2

SOLD TO: FLINT INDUSTRIES INC
FLINT STEEL CO DIV
BOX 1285
TULSA OK 74101

SHIP TO: FLINT INDUSTRIES INC
FLINT STEEL CO DIV
TULSA OK

SERIAL NUMBERS	PAT NO.	HEAT NUMBER	SIZE AND QUANTITY: NO. PCS.	THICKNESS INCHES	WIDTH OR DIA. INCHES	LENGTH INCHES	WEIGHT POUNDS	YIELD POINT PSI	TENSILE STRENGTH PSI	ELONG. IN	ELONG. %	REQ. %
PLATES - ASTM A516-76 GR 70 PVQ & ASME SA516 GR 70 PVQ WINTER 74 ACC && GAS CUT & SIDES NORMALIZED FLATTENED TO STO TCL												
CO# B-813848 GH 223-48680												
PLATES HEAT TREATED WITH TEST SPECIMENS ATTACHED AND YIELD STRENGTH @ .5% E.U.L.												
C 32961		802C43820	2	1 3/4 N 1650 DEG F - 58 MIN	96	240 CE-8 & CE-9	22870	49400	76400	2	28	
MLSL												
PLATES - ASTM A516-76 GR 70 PVQ & ASME SA516 GR 70 PVQ WINTER 74 ACC &&												
CO# B 813968 B GH 223-49744												
YIELD STRENGTH @ .5% E.U.L.												
C120042		802C47700	1	3/4	120	300	7657	47800	72600	8	23	
C123075		802C48230	1	3/4	120	300	7657	54400	82700	8	25	

Q—QUENCH TEMPERATURE T—TEMPER TEMPERATURE N—NORMALIZE TEMPERATURE

SERIAL NUMBERS	PAT NO.	HEAT NUMBER	HARD	BRNO	CHARPY IMPACT: THICKNESS INCHES	TYPE	SIZE	ORI.	TEST TEMP F	ENERGY FT. LBS. 1	2	3	SHEAR (%) 1	2	3	LAT. EXP. 1	2	3	MIL
ELIGIBLE																			

note: Pads to qualify for 802185 Sulfur

HEAT NUMBER	CHEMICAL ANALYSIS: C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Cb	N		MACRO GRAIN SIZE
802C43820	.22	1.04	.021	.020	.224												S-
802C47700	.24	1.09	.012	.018	.226												S-
802C48230	.24	1.13	.014	.015	.294												S-

SUBSCRIBED AND SWORN TO BEFORE ME
THIS 27 DAY OF April, 1978
M A Evans
NOTARY PUBLIC
PORTER COUNTY INDIANA
MY COMMISSION EXPIRES JULY 26, 1980

BECHTE 898

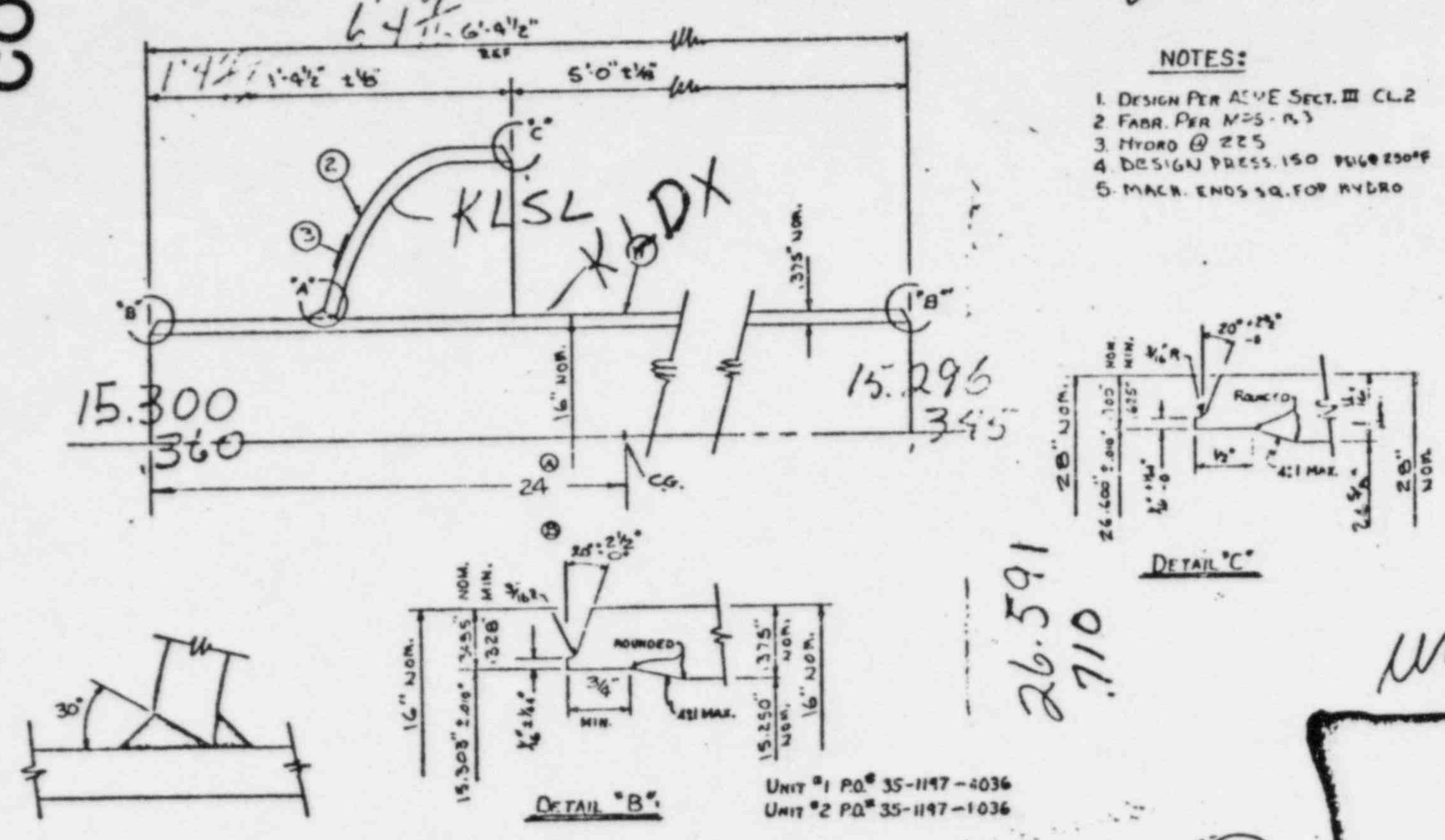
I CERTIFY THAT THE ABOVE RESULTS ARE A TRUE AND CORRECT COPY OF RECORDS PREPARED AND MAINTAINED BY BETHLEHEM IN COMPLIANCE WITH THE REQUIREMENTS OF THE SPECIFICATION CITED ABOVE.

CHIEF METALLURGIST R L Miller per W Evans

COPY

KLSL = CE8

20A



NOTES:

1. DESIGN PER ASME SECT. III CL.2
2. FABR. PER NPS-B.3
3. HYDRO @ 225
4. DESIGN PRESS. 150 PSIG @ 250°F
5. MACH. ENDS SQ. FOR HYDRO

Unit #1 P.O.# 35-1197-4036
Unit #2 P.O.# 35-1197-1036

As-Built Dwg.
K.R. 1/22/79

BECHTEL
898

28
14
42

UNCONTROLLED COPY

SURVEILLANCE SPECIALIST 27

UN-CONTROLLED COPY

NUCLEAR

REV	DESCRIPTION
A	[illegible]
B	WAS 20° ±2½°

ITEM	QTY	DESCRIPTION	SPEC.	WT.
3	4	CODE NAME PL.	SS	4
2	4	28" O.D. × 1 5/16 MIN. 3:1 SS HD 2" S.F.	SA-420-WPL6	1764
1	4	15" STD. PIPE 6'-4½ LG.	SA-106-B	1596

FEATURE CONTROL SYMBOLS PER MIL STD. 8

FINISHES: UNLESS OTHERWISE SPECIFIED. BREAK ALL SHARP EDGES UNLESS OTHERWISE SPECIFIED

G & W ENERGY PRODUCTS GROUP
GULF & WESTERN MANUFACTURING COMPANY

TITLE: McGUIRE ENERGY (?) PENETRATION ASSY M-33 & M-34

DWG NO. C-8C2155-20 REV B

FORM N-2 MANUFAC' 'ERS DATA REPORT FOR NUCLEAR P AND APPURTENANC COPY

As required by the Provisions of the ASME Code Rules

1. (a) Manufactured by Energy Products Group; Plant 12
Gulf+Western Manufacturing Co., 1st & Iron Streets, Paola, Kansas
(Name and address of Manufacturer of part)

(b) Manufactured for Brown & Root, Inc. Houston, Texas
(Name and address of Manufacturer of completed nuclear component)

2. Identification-Manufacturer's Serial No. of Part 802185 - 20A Nat'l Bd. No.

(a) Constructed According to Drawing No. 802185 -20 Rev. B Drawing Prepared by Gulf+Western Energy Products Group

(b) Description of Part Inspected 28" OD x 6'-4-1/2" lg. Penetration

★ (c) Applicable ASME Code: Section III, Edition 74, Addenda date Summer 76, Case No. N-242-1 Class 2

★ 3. Remarks: Moderate Energy Penetration Ass'y #M-33 Unit #1
(Brief description of service for which component was designed)

We certify that the corrections made in this report are correct and that the component conforms to the correction described herein.

Signed- Taylor Forge Engineered Systems by [signature] date 8-9-83

★ Our ASME Certificate of Authorization N-1937 expires 11-25-80

(Applies) Signed [signature], RICHARD B SILVA Date 8-9-83

Commission NB 1614 KS 17D HSBI & I Co.
Nat'l. Board, State Province & No.

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the part Manufacturer. An appurtenance Manufacturer is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the component Design Specification and Stress Report.)

Date 1-24 19 79 Signed Energy Products Group By [signature]
(Manufacturer)

SURVEILLANCE SPECIALIST 27

Certificate of Authorization Expires 11-25-80 Certificate of Authorization No. 1937

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

Design information on file at

Stress analysis report on file at

Design specifications certified by Prof. Eng. State Reg. No.

Stress analysis report certified by Prof. Eng. State Reg. No.

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 or Province of Arkansas and employed by (Factory Mutual System) of Philadelphia, Pa. Philadelphia Mfg. Mutual Ins. Co. have inspected the part of a pressure vessel described in this Manufacturer's Partial Data Report on 11/21/78 19___, and state that to the best of my knowledge and belief, the Manufacturer has constructed this part 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 part described in this Manufacturer's Partial 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 11/24/78 19___

[signature] Commissions Arkansas 627
Inspector's Signature National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in items 1-2 on this data report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded in item 3, "Remarks".

BECHTEL
698

802185 FORM N-2 (back) Item 20 A COPY

Items 4–8 incl. to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

4. Shell: Material Pipe SA-106-B (Kind & Spec. No.) T.S. 60000 (Min. of Range Specified) Nominal Thickness .375 in. Corrosion Allowance 0 in. Dia. 2 ft. 4 in. Length 6 ft. 4-1/2 in.

5. Seams: Long _____ H.T.[1] _____ R.T. _____ Efficiency _____ %

Girth Single H.T.[1] _____ R.T. _____ No. of Courses _____

6. Heads: (a) Material SA-420-WPL6 T.S. 60000 (b) Material _____ T.S. _____

Location (Top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a)								
(b)								

~~SA-333-GR6~~ SA-516-70

If removable, bolts used _____ (Material, Spec. No., T.S., Size, Number) Other fastening _____ (Describe or attach sketch)

7. Jacket Closure: _____ (Describe as edge and weld, bar, etc. If bar give dimensions, if bolted, describe or sketch)

8. Design pressure[2] _____ psi at _____ °F Drop Weight _____ Charpy Impact _____ ft-lb at temp. of _____ °F

Items 9 and 10 to be completed for tube sections

9. Tube Sheets: Stationary. Material _____ (Kind & Spec. No.) Dia. _____ (Subject to pressure) Thickness ___ in. Attachment _____ (Welded, Bolted)

Floating. Material _____ Dia. _____ Thickness ___ in. Attachment _____

10. Tubes: Material _____ O.D. ___ in. Thickness _____ inches or gage. Number _____ Type _____ (Str. or U)

Items 11–14 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

11. Shell: Material _____ (Kind & Spec. No.) T.S. _____ (Min. of Range Specified) Nominal Thickness ___ in. Corrosion Allowance ___ in. Dia. ___ ft. ___ in. Length ___ ft. ___ in.

12. Seams: Long _____ H.T.[1] _____ R.T. _____ Efficiency _____ %

Girth _____ H.T.[1] _____ R.T. _____ No. of Courses _____

13. Heads (a) Material _____ T.S. _____ (b) Material _____ T.S. _____

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Top, bottom, ends								
(b) Channel								

If removable, bolts used (a) _____ (b) _____ (c) _____ Other fastening _____ (Describe or attach sketch)

14. Design pressure[2] _____ psi at _____ °F Drop Weight _____ Charpy Impact _____ ft-lb at temp. of _____ °F

Items below to be completed for all vessels where applicable.

15. Safety Valve Outlets: Number _____ Size _____ Location _____

16. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Dia. or Size	Type	Material	Thickness	Reinforcement Material	How Attached

Inspection Openings: Manholes, No. _____ Size _____ Location _____
Handholes, No. _____ Size _____ Location _____
Threaded, No. _____ Size _____ Location _____

18. Supports: Skirt _____ (Yes or No) Lugs _____ (Number) Legs _____ (Number) Other _____ (Describe) Attached _____ (Where & How)

[1] If Postweld Heat-Treated.
[2] List other internal or external pressure with coincident temperature when applicable.

13 SURVEILLANCE SPECIALIST 27

BECHTEL 698

Multiple Penetration Header Plates

W6B/37EA/jj

CORRECTED REPORT 2-14-83 C. Massey

P6.10

RI # 579

CUSTOMER South Texas Project

CUSTOMER ORDER NO. 35-1197-4036

PACKING LIST NO.

The finished product shown was produced in the U.S.A.

GW

Taylor Forge Engineered Systems

P.O. Box 8
Paola, KS 66071
913/294-5331

SPECIFICATION NO. ASME Section III Class 2 Summer 76

HEAT TREATMENT *Pipe was solution annealing heat treat with material at a temperature of 1900°F. minimum followed by rapid quenching.

OUR ORDER NO. 802185-17A

YOUR PENETRATION NO. M-29, Unit #1

CERTIFIED MATERIAL TEST REPORT

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s)

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ___% OFFSET, PSI	TENSILE STRENGTH PSI	ELONG IN ___" %	RED OF AREA %	CHEMICAL ANALYSIS: C	MN	P	S	SI	MO	CR	NI	DESCRIPTION
		ITEM #17A			STP#	2C091MPN029A							
* KKEJ	50,300	92,000	2" 61		.045	1.80	.019	.004	SA-376-TP316 .66	2.69	17.0	13.0	1" S/160 Pipe x 5'-6" long
					*Corrosion tests found to be satisfactory per ASTM-A-262, Practice A, Para. 5.3.2 (Fig 2)								
* KLAU	52,200	77,100	8" 29		.23	1.03	.014	.017	SA-516-70 .233				1" Plate x 12.75" ø
		*Charpy	V +40°F Size		(Full)	Ft. Lbs.	52-53-48						
						MILS:	46-47-42						
						%Shear	67-72-63						
* KLAU	52,200	77,100	8" 29		.23	1.03	.014	.017	SA-516-70 .233				1" Plate x 11.845" ø
		*Charpy	V +40°F Size		(full)	Ft. Lbs.	52-53-48						
						MILS:	46-47-42						
						% shear	67-72-63						

BECHTEL 655

REMARKS: Fabricated per MPS B2 R/0 3-7-77 - Acceptable
PT per ES 3.12.2 R/3 9-13-76 and Amend. 2 R/0 1-20-77 - Acceptable
Hydrotested per MPS C7 and ES 3.16.1 R/0 12-8-76 at 3750 PSIG - Acceptable
*UT pipe per NB-2552

*SEE VENDOR CERTIFICATION

NUCLEAR

Copy

GW011

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____ 19____

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager.

METALLURGICAL DEPARTMENT

BURNS HARBOR PLANT

REPORT OF TESTS AND ANALYSES

COPY

RIP #0599

SHIPMENT NO	DATE SHIPPED	CAR OR VEHICLE NO	PAGE
363-[illegible]94	4-29-78		2

SOLD TO
GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
BOX B
PAOLA KS 66071

SHIP TO
GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
THE IRONING
PAOLA KS

NOTE	SERIAL NUMBER	PAT NO	HEAT NUMBER	SIZE AND QUANTITY: NO PCS	THICKNESS INCHES	WIDTH OR DIA INCHES	LENGTH INCHES	WEIGHT POUNDS	YIELD POINT PSI	TENSILE STRENGTH PSI	ELONG IN	ELONG %
	PLATES - ASME SA516 GR 70 PVQ SUMMER 76 ADD CH-V NC2300 PLT T 25MILS AT +40F INFO T FTL&SHR AT +40F && MILL TEST PCS NORMALIZED											
	COIL 3-11034 GH 323-3361 REP 2											
	TEST SPECIMENS LABORATORY HEAT TREATED AND YIELD STRENGTH @ .5% E.U.L.											
C	6894		822C43840	1	1	65	113	2083	52200	77100	8	26

Released
Q.C.
TFES
16

OCT 3 1 1981

KLAU

NUCLEAR

NOTE: Q—QUENCH TEMPERATURE T—TEMPER TEMPERATURE N—NORMALIZE TEMPERATURE

N 1700 DEG F FOR 1 HR/IN

IN ACCORDANCE WITH Q.A. PROGRAM DTD 12-1-77 PER ASME SECT III NCA 3800

SERIAL NUMBER	PAT NO	HEAT NUMBER	HARD	BEND	CHARPY IMPACT: THICKNESS INCHES	TYPE	SIZE	DIR	TEST TEMP	ENERGY T.E.L.S. 1	2	3	SHEAR (%) 1	2	3	LAT EXP 1	2
C 6894		822C43840			1.000	V	FULL	T	+40	52	53	48	67	72	63	46	47

HEAT NUMBER	CHEMICAL ANALYSIS: C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Cb	N	MISC
822C43840	.23	1.03	.014	.017	.233											

I CERTIFY THAT THE ABOVE RESULTS ARE A TRUE AND CORRECT COPY OF RECORDS PREPARED AND MAINTAINED BY BETHLEHEM IN COMPLIANCE WITH THE REQUIREMENTS OF THE SPECIFICATION CITED ABOVE

CHIEF METALLURGIST R. L. MILLER PER C JV

A1 29

RIP#R596

CORRECTIVE COPY 10-16-81

BETHLEHEM STEEL CORPORATION
METALLURGICAL DEPARTMENT

BURNS HARBOR PLANT

REPORT OF TESTS AND ANALYSES

SHIPMENT NO	DATE SHIPPED	CAR OR VEHICLE NO	PAGE
363-08794	4-29-78		2

SOLD TO
GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
BOX B
PAOLA KS 66071

SHIP TO
GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
THEIR SIDING
PAOLA KS

ITEM	SERIAL NUMBER	PAT NO	HEAT NUMBER	SIZE AND QUANTITY: NO PCS	THICKNESS INCHES	WIDTH OR DIA INCHES	LENGTH INCHES	WEIGHT POUNDS	YIELD POINT PSI	TENSILE STRENGTH PSI	ELONG IN	ELONG %	RED %
	PLATES - ASME SA516 GR 70 PVD SUMMER 76 ADD CH-V NCP30D PLT T 25MILS AT +40F INFO T FTL.05HR AT +40F LL MILL TEST PCS NORMALIZED												
	CUST SP11034 GN 320-3301 REP 2												
	TEST SPECIMENS LABORATORY HEAT TREATED AND YIELD STRENGTH @ .5% E.U.L.												
C	6894		822C43840	1	1	65	113	2033	52200	77100	8	29	

Released Q.C. TFES 16

OCT 3 1 1981

KLAU

NUCLEAR

N 1700 DEG F FOR 1 HR/IN

IN ACCORDANCE WITH Q.A. PROGRAM DTD 12-1-77 PER ASME SECT III NCA 3800

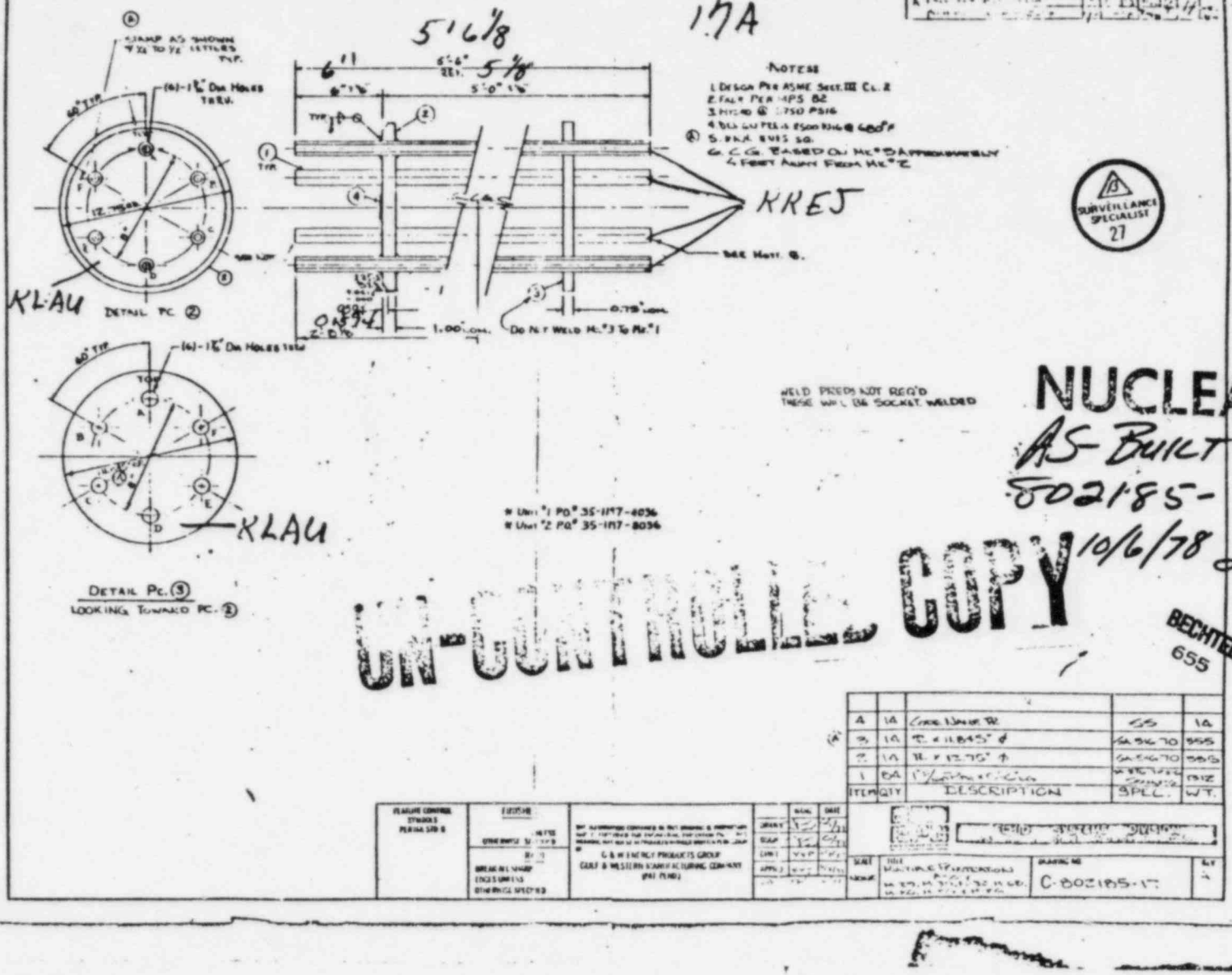
SERIAL NUMBER	PAT NO	HEAT NUMBER	HARD	BEND	CHARPY IMPACT: THICKNESS INCHES	TYPE	SIZE	DIR	TEST TEMP	ENERGY ABSORBED 1	2	3	SHEAR (%) 1	2	3	LAT EXP 1	2	3	MILS
C 6894		822C43840			1.000	V	FULL	T	+40	52	53	48	67	72	63	45	47	42	

HEAT NUMBER	CHEMICAL ANALYSIS: C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Cb	N	WIDMANSTATTEN GRAIN SIZE
822C43840	.23	1.03	.014	.017	.233											5-8

BECHTEL 655

I CERTIFY THAT THE ABOVE RESULTS ARE A TRUE AND CORRECT COPY OF RECORDS PREPARED AND MAINTAINED BY BETHLEHEM IN COMPLIANCE WITH THE REQUIREMENTS OF THE SPECIFICATION CITED ABOVE.

CHIEF METALLURGIST S. L. PILLS MGR. QA


5'6 1/8
17A
NOTES
KRES
KLAU
DETAIL PC ②
KLAU
DETAIL PC. ③
LOOKING TOWARD PC. ②
WELD PREPS NOT REQ'D
THESE WILL BE SOCKET WELDED
NUCLEAR
AS-BUILT DWG.
802185-17A
10/6/78 L.L.
UN-CONTROLLED COPY
BECHTEL
655
C-802185-17

COPY

IP# 0599 COPY

FORM N-2 MANUFACTURERS DATA REPORT FOR NUCLEAR PART AND APPURTENANCES

As required by the Provisions of the ASME Code Rules

1. (a) Manufactured by Energy Products Group; Plant 12 Gulf Western Manufacturing Co., 1st & Iron Streets, Paola, Kansas
(Name and address of Manufacturer of part)

(b) Manufactured for Brown & Root, Inc. Houston Texas
(Name and address of Manufacturer of completed nuclear component)

2. Identification-Manufacturer's Serial No. of Part 802185 - 17A Nat'l Bd. No.

(a) Constructed According to Drawing No. 802185 - 17 Drawing Prepared by Fluid Systems Division Energy Products Group

(b) Description of Part Inspected Multiple Penetration Ass'y M-29 x 5'-6" lg. (REF.)

(c) Applicable ASME Code: Section III, Edition 74, Addenda date Summer 76, Case No. ----- Class 2

3. Remarks: Multiple Penetration Ass'y. M-29
(Brief description of service for which component was designed)

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the part Manufacturer. An appurtenance Manufacturer is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the component Design Specification and Stress Report.)

Date 10/11 19 78 Signed Energy Products Group By S. Griggs
(Manufacturer)

Certificate of Authorization Expires 11-25-80 Certificate of Authorization No. 1937

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

Design information on file at

Stress analysis report on file at

Design specifications certified by Prof. Eng. State Reg. No.

Stress analysis report certified by Prof. Eng. State Reg. No.

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 or Province of Arkansas and employed by (Factory Mutual System) Philadelphia Mfg. Mutual Ins. Co. of Philadelphia, Pa. have inspected the part of a pressure vessel described in the Manufacturer's Partial Data Report on 10/11/78 19, and state that to the best of my knowledge and belief, the Manufacturer has constructed this part 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 part described in this Manufacturer's Partial 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.

BECHTEL 655

Date 10/11/78 19

SURVEILLANCE SPECIALIST 27

D. McRae Inspector's Signature Commissions Arkansas 627
National Board, State, Province and No.

* Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in items 1 and 2 on this data report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded in item 3, "Remarks."

NUCLEAR

Pipe SA-376-316 75000 Nominal .250 Corrosion 0 0 1 5 6
Attachment Weld
Yes H.T. No R.T. No Efficiency 100 %

Plate
6. (a) Material SA-516-70 T.S. 70000 (b) Material SA-516-70 T.S. 70000

Location (Top, bottom, outlet)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to press. (Conv. or Conc.)
(a)								
(b)								

If removable, bolts used (Material, Spec. No., T.S., Size, Number) Other fastening (Describe or attach sketch)

7. Jacket Closure (Describe as ogee and weld, bar, etc. If bar give dimensions, if bolted, describe or sketch)

8. Design pressure psi at °F Drop Weight Charpy Impact ft-lb at temp. of

Items 9 and 10 to be completed for tube sections

9. Tube Sheets: Stationary, Material (Kind & Spec. No.) Dia. (Subject to pressure) Thickness in. Attachment (Welded, Bolted)

Floating, Material Dia. Thickness in. Attachment

10. Tubes: Material O.D. in. Thickness inches or gage. Number Type (Str. or C)

Items 11–13 inclusive to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

11. Shell: Material (Kind & Spec. No.) T.S. Nominal Thickness in. Corrosion Allowance in. Dia. ft. in. Length ft. in.

12. Shell: Long H.T. R.T. Efficiency %

Girth H.T. R.T. No. of Courses

13. Heads (a) Material T.S. (b) Material T.S.

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Top, bottom, outlet								
(b) Channel								

If removable, bolts used (a) (b) (c) Other fastening (Describe or attach sketch)

Drop Weight Charpy Impact ft-lb at temp. of

14. Design pressure psi at °F

Items below to be completed for all vessels where applicable.

15. Safety Valve outlets: Number Size Location

16. Nozzles:

Purpose (Inlet, Outlet, Drain, etc.)	Number	Diameter or Size	Type	Material	Thickness	Reinforcement Material	How Attached

17. Inspection Manholes: No. Size Location
Openings: Handholes: No. Size Location
Threaded: No. Size Location

Supports: Lugs Legs Other Attached
Number

BECHTEL 655

SURVEILLANCE SPECIALIST 27

Electrical Penetrations

SOLD TO: L. Valley McLeod, Inc.
151 East Fifth St.
Elmira, N. Y. 14902

SHIP TO: Westinghouse Elec. Corp.
Ind. & Govt. Tube Div.
West Cir
Horseheads, N. Y. 14845

DETAILED ANALYSIS REPORT

Tube Turns Division
Chemetron Corporation

Replaced DAR dated 3/26/80

HOUSTON, TX 4/21/80 - bh **

TUBE TURNS ORDER NO 11 4 91339

CUSTOMER'S ORDER NO MD 60804

DESCRIPTION	PHYSICALS OF MATERIALS FROM WHICH MADE					CHEMICAL ANALYSIS									HEAT OR LOT NO	SPECIFICATION OF MATERIAL FROM WHICH MADE
	** HEAT TREATMENT	YIELD STRENGTH PSI	TENSILE STRENGTH PSI	PERCENT ELONGATION IN 2"	PERCENT REDUCTION IN AREA	C	MN	P	S	SI	NI	CR	MO	xxx CU		
Item 001 4 Pieces		48,000	79,000	31.0	65.4	.26	.84	.007	.026	.22	.02	.04	.01	.02	6021151	A-350
" PT. 30 R.F. Bore 18.156"		Charpy "V" Notch @ 0°F.				45-32-52 Ft. Lbs./.042-.035-.046 Mils L.E./60-60-60% Shear										
(.922" Wall) per Dwg. 42-40130-1																
dated 6/30/78. 20"150# Weld																
Neck Flg. per SA350 LF1, with																
end protectors.																

The material furnished on this order was produced in accordance with Tube Turns Quality System Program that meets the applicable requirements of NCA3800 of ASME Sect. III.

This program meets the applicable sections of our Quality Assurance Program approved under certificate of authorization N1807 expires 7/15/80

Forgings were normalized by heating to 1650°F, holding 5 hours and cooling in still air.

** Revised 7 March, 1984

S.D. Vitatoe, Quality Assurance

* STANDARD ROUND TEST SPECIMEN
** 1 ANNEALED
2 NORMALIZED
3 NORMALIZED AND STRESS RELIEVED
4 STRESS RELIEVED
5 QUENCHED AND TEMPERED
6 HOT FORMED
7 HEAT TREAT PER ORDER SPECIFICATION

SUBSCRIBED AND SWORN TO BEFORE ME THIS

DAY OF 19

I HEREBY CERTIFY THIS REPORT TO BE TRUE AND CORRECT AS SHOWN BY RECORDS IN THE POSSESSION OF THIS CORPORATION.

J. R. Alton, Asst. Q. C. Mgr.

COPY

Main Steam Process Pipe and Header

W6B/37EA/jj

APPENDIX V

Form NPP

COPY

P3

FORM NPP-1 DATA REPORT FOR FABRICATED NUCLEAR PIPING SUBASSEMBLIES*
(As Required by the Provisions of the ASME Code Rules)

1. Fabricated by SOUTHWEST FABRICATING & WELDING CO. INC. 7525 SHERMAN, HOU. TX 77011 Order No. S.O.# 02657-MS
(Name and Address of Fabricator)

2. Fabricated for HOUSTON LIGHTING & POWER CO., HOUSTON, TX. Order No. P.O.#35-1197-6014
HOUSTON LIGHTING & POWER CO.,
(Name and Address)

3. Owner SOUTH TEXAS NUCLEAR UNIT I 4. Location of Plant WADSWORTH, TX.

5. Piping System Identification Main Steam, Serial #39722
(Brief description of intended use, main coolant etc.)

(a) Drawing No. 02657-MS #60 & #60R Prepared by SOUTHWEST FAB. & WELDING CO., INC.

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2

Edition 1974** , Addenda Date WINTER 1975 ** , Case No. ---

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report EXT. HDR. - TAYLOR FORGE - ITEM (A) S/N 803450-2A1,
(Name of Part – Item number, Manufacturer's name, and identifying stamp)
ITEM (B) S/N 803450-2B2 & ITEM (C) S/N 803450-2B3.

RIP#5075

7. Shop Hydrostatic Test N/A psi.

8. Description of piping inspected MK: 2G369P-MS-1003-GA2-08-J; SA-333 Gr. 6 Sml's, 16" (.844"W)
(Include – mark no. – material spec. – nom. pipe size – schedule or thickness – length – fittings – flanges, etc.)
3'-2 3/4" lg.; SA-234 WPB Wld'd, 33.875" O.D. (1.183" MW) X 33.875" O.D. (1.621" MW) ** EXT. HDR W/(3) outlets-16" O.D. (.738" MW), 9" O.D. (1.500" MW) & 4.5" O.D. (.295" MW); SA-234 WPB Wld'd, 33.875" O.D. (1.621" MW) ** EXT. HDR. W/(2) outlets-9" O.D. (1.500" MW); SA-234 WPB Wld'd, 33.875" O.D. (1.621" MW) X 31.125" O.D. (1.746" MW) ** EXT. HDR. W/(3) outlets-(1) 12.750" O.D. (.602" MW) & (2) 9" O.D. (1.500" MW); SA-350 LF2, 6" 1500# LG. WN RF Flg. (5); SA-420 WPL6 Sml's, 16" S/80 Weld Cap; SA-350 LF2, 16" X 2" 3000# S-O-L; SA-350 LF2, 1 1/2" 6000# S/W Bosset (2); SA-350 LF2, 33 7/8" O.D. X 1" 3000# S-O-L (5); SA-350 LF2, 16" X 1" 3000# S-O-L (2); SA-350 LF2, 1" 3000# FL. S-O-L

**Material in accordance with 1980 Edition, Summer 1980.

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 11-16-84 Signed SF&WCO (Fabricator) By (1h) Maria Lemmy

Certificate of Authorization Expires JULY 23, 1985 Certificate of Authorization No. N-1459

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 or Province of TEXAS and employed by H.S.B.I.&I.Co. HARTFORD, CT have inspected the piping described in this Data Report on 11-16 19 84, and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer make any warranty, expressed or implied, concerning the piping 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 11-16, 19 84

(Inspector) Commissions Ins 370
National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" 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 in item 7, "Remarks".

COPY

Coffer Corporation / Flange Division

4444 Center St Houston, Texas 77007 (713) 868-4421

MILL TEST REPORT

CUSTOMER SOUTHWEST FABRICATING P.O. No. 2657N-348

COFFER W/O No. 40556-N

ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
1	40	6" 1500# RF LWN X14" LONG A.S.M.E. SECTION III CLASS 2 1974 Edition through Winter 1975 Addenda 10CFR21 applies.	SA-350 LF-2 RIP#5075	ZVA

SPECIAL REQUIREMENT

MATERIALS ON THIS ORDER WERE PRODUCED UNDER A QUALITY SYSTEM PROGRAM MEETING THE REQUIREMENTS OF A.S.M.E. SECTION III, NCA 3800 and COFFER CORPORATION QUALITY SYSTEM EFFECTIVE FEBRUARY 17, 1984 REV. E; APPROVED BY SOUTHWEST FAB., MARCH 28, 1984.
MATERIALS ON THIS REPORT WERE NORMALIZED AT 1650 DEG.F., FOR TWO HOURS AND AIR COOLED.

CHEMICAL ANALYSIS

ITEM	HEAT CODE	MILL	HEAT NO.	CAR.	MAN.	PHOS.	SUL.	SIL.	NI	CR	MO	CU	
1	ZVA			.22	1.20	.006	.024	.19					
2													
3													
4													

PHYSICALS / CHARPY RESULTS

ITEM	TENSILE	YIELD	ELONG	REDUCTION	1ST	2ND	3RD	AVG.	TEMP.
1	79,500	53,000	36.0	68.0	49	123	146		-50 DEG.F
2					30	90	90		% SHEAR
3					39	86	79		M.L.E.
4									

I HEREBY CERTIFY THAT THE REPORTED FIGURES ARE CORRECT, AS CONTAINED IN THE RECORDS OF THE CORPORATION.

CERTIFICATION Rodlie A. Haas

BECHTEL 743

15

84 WFI (11)

COPY

INTERNATIONAL NUCLEAR PRODUCTS, INC.

4405 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695 3633
☐

4407 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-2835
☒

SOLD TO SOUTHWEST FABRICATING AND WELDING
P.O.BOX 9449
HOUSTON, TEXAS 77281

Law Temp

16" S/80 Weld Caps

CUSTOMERS ORDER NO. 2657N-419

WFI NO. N1812 DATE SEPTEMBER 19,1984

CERTIFIED MATERIAL TEST REPORT

THIS MATERIAL IS FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ASME SECTION II, PART "A" MATERIAL SPECIFICATION REFERENCED AND ASME SECTION III, CLASS II 1974 EDITION THRU WINTER 1975 ADDENDA. THIS MATERIAL WAS MANUFACTURED AND PROCESSED IN ACCORDANCE WITH THE QUALITY SYSTEM REQUIREMENTS OF ASME SECTION III, SUBSECTION NCA3800/NA3700. 10 CFR 21 APPLIES

ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
1	8	16" S/80 B/W WELD CAPS -50°F CHARPYS 107/100/104 FT.LBS. 60/60/70 % SHEAR .062/.057/.059 M.L.E.	ASME SA420WPL6 SA350LF2 RIP#5075	132BN

CHEMICAL COMPOSITION

HEAT CODE	MILL NO	C	MN	P	S	SI	NI	CR	MO			
132BN	214881	.24	1.19	.015	.027	.18						
---	SHARON											
132BN	PRODUCT	.26	1.26	.018	.024	.20						
---	ANALYSIS											

MECHANICAL PROPERTIES

HEAT CODE	TENSILE PSI	YIELD PSI	ELONG %	RA %	HARDNESS
132BN	83,266	56,012	32.3	59.8	152HBN
	CHARPY "V" NOTCH IMPACT TESTS IN ACCORDANCE WITH ASME SECTION III, SUBSECTION NC-2342				
	~~+40°F 252/228/228 FT.LBS.~~ 100/100/100 % SHEAR				
		.094/.087/.086 MLE			

HEAT TREATMENT 132BN AUSTENITIZED AT 1650°F FOR 6 HOURS AND WATER QUENCHED: TEMPERED AT 1150°F FOR 6 HOURS AND AIR COOLED IN STILL AIR

S.F.& W CO. QA 2

We certify that the material furnished on this order complies in all respects with the specifications as stated and that this correct information is as contained in our records.

WFI, Inc.

Charles V. Clagett Q.A. DEPT.

Subscribed before me this 19TH day of SEPTEMBER, 1984

NOTARY PUBLIC - HARRIS COUNTY, TEXAS

QSC #425
Expiration Date 1-16-1987

BECHTEL
743

WFI 018

16

COPY

84

WFI
NUCLEAR PRODUCTS, INC.

INTERNATIONAL
4405 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-3633
☐

NUCLEAR PRODUCTS
4407 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-2835
☒

SOLD 65/4TO

SOUTHWESTERN FABRICATING AND WELDING COMPANY
P.O.BOX 9449
HOUSTON, TEXAS 77011

Low Temp
SA 350/LF2

CUSTOMERS ORDER NO. 2657N-341

WFI NO. N-1705 DATE MAY 18, 1984

CERTIFIED MATERIAL TEST REPORT

THIS MATERIAL IS FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ASME SECTION II, PART ", MATERIAL SPECIFICATION REFERENCED, AND ASME SECTION III, CLASS 2, 1974 EDITION, THRU WINTER 1975 ADDENDA. THIS MATERIAL WAS MANUFACTURED AND PROCESSED IN ACCORDANCE WITH THE QUALITY SYSTEMS REQUIREMENTS OF ASME SECTION III, SUBSECTION NCA3800/ NA3700: 10 CFR 21 APPLIES.

ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
4	8	16" O.D. X 2" 3M# SOCKET WELD PIPET	ASME SA-350-LF2	976AN

CHEMICAL COMPOSITION

HEAT CODE	MILL NO.	C	MN	P	S	SI	NI	CR	MO.			
976AN	LADLE	.24	.93	.010	.032	.26			RIP#5075			
976AN	PRODUCT	.26	1.00	.011	.026	.29						
	ANALYSIS											

MECHANICAL PROPERTIES

HEAT CODE	TENSILE PSI	YIELD PSI	ELONG %	RA %	HARDNESS
976AN	81,563	54,709	35.2	72.4	143
	CHARPYS -50°F 109/111/99 FT.LBS.				

HEAT TREATMENT 976AN - AUSTENITIZED AT 1625°F FOR 5 HOURS AND WATER QUENCHED: TEMPERED AT 1150°F FOR 4 HOURS AND AIR COOLED IN STILL AIR.

S.F.&W.CO. QA 2

We certify that the material furnished on this order complies in all respects with the specifications as stated and that this correct information is as containec in our records.

WFI, Inc.

Virgil Kellogg Q.A. DEPT.

Subscribed before me this 18TH day of MAY, 19 8

NOTARY PUBLIC - HARRIS COUNTY, TEXAS

Q.S.C. # 425
Expiration Date 1-16-1987

BECHTEL
743

WFI 013

115

84

COPY

NUCLEAR PRODUCTS, INC.

INTERNATIONAL
4405 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-3633
☐

NUCLEAR PRODUCTS
4407 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-2835
☒

SOLD TO SOUTHWEST FABRICATING & WELDING COMPANY
P.O. BOX 9449
HOUSTON, TEXAS 77011

42

Low Temp
SA-350/LF-2

CUSTOMERS ORDER NO. 2657N-341

WFI NO. N-17051 DATE MAY 18, 1984

CERTIFIED MATERIAL TEST REPORT

THIS MATERIAL IS FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ASME SECTION II, PART "A", MATERIAL SPECIFICATION REFERENCED AND ASME SECTION III, CLASS 2, 1974 EDITION, THRU WINTER 1975 ADDENDA. THIS MATERIAL WAS MANUFACTURED AND PROCESSED IN ACCORDANCE WITH THE QUALITY SYSTEMS REQUIREMENTS OF ASME SECTION III, SUBSECTION NCA3800/NA 3700: 10 CFR 21 APPLIES:

ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
1	32	1-1/2" 6MM SOCKET WELD BOSSET (XXH BORE)	ASME SA350-LF2	114BN

CHEMICAL COMPOSITION

HEAT CODE	MILL NO	C	MN	P	S	SI	NI	CR	MO			
114BN	LADLE	.27	.92	.011	.022	.27						
									RIP#5075			
114BN	PRODUCT	.26	.85	.006	.019	.23						
"	ANALYSIS											

MECHANICAL PROPERTIES

HEAT CODE	TENSILE PSI	YIELD PSI	ELONG %	RA %	HARDNESS
114BN	77,662	53,766	36.4	73.6	140
	CHARPYS -50°F		204/180/213 FT. LBS.		

HEAT TREATMENT 114BN- AUSTENITIZED AT 1640°F to 1650°F FOR 3 1/4 HOURS AND WATER QUENCHED. TEMPERED AT 1250°F FOR 3 1/4 HOURS AND AIR COOLED.

S.F.&W.CO. QA 2

We certify that the material furnished on this order complies in all respects with the specifications as stated and that this correct information is as contained in our records.

WFI, Inc.

Virgil Kellogg Q.A. DEPT.

Subscribed before me this 18TH day of MAY 1984

Sandra D. Wyle
NOTARY PUBLIC - HARRIS COUNTY, TEXAS

Q.S.C.# 425
Expiration Date 1-16-1987

BECHTEL
743

WFI 018

18

WPI
NUCLEAR PRODUCTS, INC.
INTERNATIONAL

4405 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-3633
☐

NUCLEAR PRODUCTS
4407 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-2835
☒

SOLD TO
SOUTHWEST FAB ICATING AND WELDING COMPANY
P.O. BOX 9449
HOUSTON, TEXAS 77011

Low Temp
SA-350 LF-2

CUSTOMERS ORDER NO. 2657N-341

WFI NO. N-1705 DATE MAY 18, 1984

CERTIFIED MATERIAL TEST REPORT

THIS MATERIAL IS FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ASME SECTION II, PART "A", MATERIAL SPECIFICATION REFERENCED, AND ASME SECTION III CLASS 2, 1974 EDITION, THRU WINTER 1975 ADDENDA. THIS MATERIAL WAS MANUFACTURED AND PROCESSED IN ACCORDANCE WITH THE QUALITY SYSTEMS REQUIREMENTS OF ASME SECTION III, SUBSECTION NCA3800/NA3700: 10 CFR 21 APPLIES:

ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
2	40	33-7/8" O.D. X 1" 3M# SOCKET WELD PIPET	ASME SA350-LF2	106BN
3	16	16" O.D. X 1" 3M# SOCKET WELD PIPET	ASME SA350-LF2	106BN
—			RIP#5075	

CHEMICAL COMPOSITION

HEAT CODE	MILL NO.	C	MN	P	S	SI	NI	CR	MO			
106BN	LADLE	.21	1.04	.017	.030	.16						
106BN	PRODUCT ANALYSIS	.21	1.08	.016	.029	.15						

MECHANICAL PROPERTIES

HEAT CODE	TENSILE PSI	YIELD PSI	ELONG %	RA %	HARDNESS
106BN	92,231	75,841	27.3	70.0	179
	CHARPYS -50°F 50/59/70 FT. LBS.				

HEAT TREATMENT 106BN - AUSTENITIZED AT 1630°F FOR 2 HOURS AND WATER QUENCHED: TEMPERED AT 1160°F FOR 2 HOURS AND AIR COOLED IN STILL AIR

S.F. & W. CO. QA 2

We certify that the material furnished on this order complies in all respects with the specifications as stated and that this correct information is as contained in our records.

WFI, Inc.

Virgil Kellogg Q.A. DEPT.

Subscribed before me this 18TH day of MAY, 19 8

Sandra L. Wyatt
NOTARY PUBLIC - HARRIS COUNTY, TEXAS

Q.S.C. # 425

Expiration Date 1-16-1987

BECHTEL
743

WFI 018

1.9

WFI
NUCLEAR PRODUCTS, INC.

INTERNATIONAL
4405 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695 3633

NUCLEAR PRODUCTS
4407 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-2835

COPY

SOLD TO
SOUTHWEST FABRICATING & WELDING
PO BOX 9449
HOUSTON, TEXAS 77011

CUSTOMERS ORDER NO. 2657N-392

WFI NO. N-1794 DATE 8/17/84

CERTIFIED MATERIAL TEST REPORT

THIS MATERIAL IS FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ASME SECTION II, PART A, MATERIAL SPECIFICATION REFERENCED AND ASME SECTION III, CLASS 2, 1974 EDITION THRU WINTER 1975 ADDENDA. THIS MATERIAL WAS MANUFACTURED AND PROCESSED IN ACCORDANCE WITH THE QUALITY SYSTEMS REQUIREMENTS OF SECTION III, SUBSECTION NCA3800/NA3700. 10 CFR PART 21 APPLIES.

ITEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
1.	8	FLAT x 1" 3M# SW PIPET	SA350-LF2	106BN

RIP#5075

CHEMICAL COMPOSITION

HEAT CODE	MILL NO	C	MN	P	S	SI	NI	CR	MO			
106BN	WFI ANALYSIS	.21	1.08	.016	.029	.15						
	LADLE	.21	1.04	.017	.030	.16						

MECHANICAL PROPERTIES

HEAT CODE	TENSILE PSI	YIELD PSI	ELONG %	RA %	HARDNESS
106BN	92,231	75,841	27.3	70.0	179
	CVN -50°F	50/59/70			

HEAT TREATMENT 106BN - AUSTENITIZED AT 1630°F FOR 2 HOURS AND WATER QUENCHED. TEMPERED AT 1160°F FOR 2 HOURS AND COOLED IN STILL AIR

S.F.&W.CO. QA 2

We certify that the material furnished on this order complies in all respects with the specifications as stated and that this correct information is as contained in our records.

WFI, Inc.
Charles F. Clayton QA DEPT.

Subscribed before me this 17th day of AUGUST 1984

Notary Public, Harris County, Texas

BECHTEL
743

Q.S.C. #425
Expiration Date: 1/16/87

120

PHOENIX STEEL CORPORATION

COPY

TUBE DIVISION
PHOENIXVILLE, PENNA.

(84) (11)

CERTIFICATE OF INSPECTION AND TESTS

DATE:	DATE SHIPPED:	MILL ORDER NO.	SHIPPING LIST
7-21-82	6-24-82	T-6881-8-30	226E

CUSTOMER ORDER NO.: I 26878 00C

Capitol Pipe & Steel P... s Co.

CAR NO.: CR 582039

MATERIAL: SEAMLESS ☐ PIPE ☒ TUBE, HOT FINISHED

SA 333 / Gr-6 Smls

SPECIFICATION:

ASTM A-333-79, ASME SA-333 Gr. 6

16" (.844"W) Pipe

NO. PCS.	OD	WALL	LENGTH	TOTAL FT.	TOTAL WT.	HEAT NO.
	16.000" x .844"					52407

Longitudinal Vee Notch Charpy at Minus 50°F. (10mm x 10mm)

Ft. Lbs.	Lateral Expansion	Per Cent Shear
64-90-80	.058-.083-.072	40-50-50

RIP#5075

HEAT NO.	C	Mn.	P.	S.	Si.	Cu.	Ni.	Cr.	Mo.	
52407	.13	1.05	.012	.019	.25					Ladle Analysis
52407	.13	1.06	.012	.019	.26					Product Analysis
52407	.14	1.08	.012	.019	.25					Product Analysis

16" Sch Std

This material was manufactured in accordance with our Quality Program revised 2-1-80 which was audited by Capitol Pipe on 7-30-81 and approved as meeting the requirements of ASME Section III, Subarticle NCA-3800.

HEAT NO.	TENSILE (KSI)	YIELD (KSI)	% ELONG. IN 2"	% RA	HARDNESS ROCKWELL	HARDNESS BRINELL	GRAIN SIZE	
52407	67.5	44.0	41.00					Normalized at 1650°F. Held for 2 hours and air cooled.

S.F.&W.CO. Q A 2

CAPITOL QA P-2 APPROVED 1/26/82

2657N-242

JOMINY DISTANCE - 16TH	ROCKWELL C	FLATTENING	HYDROSTATIC PSI
1 2 4 6 8 10 12 14 16 20 24 28 32		OK	2300

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 RECORDS ARE AS SHOWN ABOVE. FOR PROPERTIES OR CHARACTERISTICS FOR WHICH NO METHODS OF INSPECTION OR TESTING ARE PRESCRIBED IN 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.

Wayne Ciarlo
ENGINEER OF TESTS

BECHTEL 743

FORM 187 (REV. 8) (12-78)

121

COPY

Capitol

PIPE & STEEL PRODUCTS CO.
Division of BOWLINE Corporation

ALLOY PIPING MATERIALS FOR HIGH TEMPERATURE AND LOW TEMPERATURE APPLICATIONS

ADDRESS ALL REPLIES TO:
SAN ANTONIO & ORANGE STREETS
P.O. BOX 6
PEARLAND, TEXAS 77581
(713) 485-3246

301 CITY LINE AVENUE • AREA CODE 215 • TE 8-4300
BALA-CYNWYD, PENNSYLVANIA 19004

CAPITOL PIPE CERTIFICATE OF CONFORMANCE

ASME QUALITY SYSTEMS CERTIFICATE (MATERIALS) NUMBER QSC-206-1

EXPIRATION DATE: MAY 6, 1984

MATERIAL MANUFACTURER'S CERTIFICATION: 16" S/80 SA333 GR. 6 SMLS PIPE

HEAT NUMBER: 52407

MANUFACTURER: PHOENIX STEEL

REFERENCE: SOUTHWEST FAB. & WELDING
P/O# 2657N-242
Capitol S/O# 45A-5069N
Capitol Chg# H31826 45A
Item 1

Capitol Pipe certifies that the certified Mill Test Report supplied for the material described above, is a true copy of the material manufacturer's original as contained in our files. We further certify that this material was procured under and controlled by the Quality Systems Program covered by the ASME Certificate shown above.

Based upon Capitol's review of the Material Manufacturer's Certified Mill Test Report and the requirements of the purchase order, this material is supplied in accordance with the specifications checked below.

RIP#5075

☐ ASTM Specification _____

☑ ASME Specification SA333 GR. 6, 1974 Edition ~~Winter 1975~~ Addenda.

☑ ASME Section III, Class 2, 1974 Edition, Winter 1975 Addenda, paragraphs N-C 2000. ~~(including the provisions of N-2610).~~

☑ Additional Requirements NOTES 1 AND 3 OF QA-20 DTD 10/11/74 APPLY. NCA-3800 APPLIES. 10 CFR PART 21 APPLIES.

Capitol Pipe certifies that the following tests, examinations or treatments were performed in accordance with and meet the requirements of the specifications shown above. Reports containing the results of these operations are included as attachments.

S.F.&W.CO. C 2

BECHTEL
743

Isabella Bailey DATE: 2/16/84
QUALITY ASSURANCE REPRESENTATIVE

Received Partial D Calcs attached

132

CUSTOMER Southwest Fabricating & Welding C

P.O. Box 9449
Houston, TEXAS 77261-9449

CUSTOMER ORDER NO. 2657N-214

PACKING LIST NO. _____

GW **Taylor Forge Engineered Systems**

P.O. Box 8
Phone 413 568-9571
913/294-5331

SPECIFICATION NO. _____

HEAT TREATMENT _____

OUR ORDER NO. 803450

COVER SHEET

2A1 ~ 2G369P-MS-1003-GA2-3J ~

CERTIFIED MATERIAL TEST REPORT

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s)

The finished product shown was produced in the U.S.A.

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ___ % OFFSET PSI	TENSILE STRENGTH PSI	ELONG IN ___ %	RED OF AREA %	CHEMICAL ANALYSIS: C	MN	P	S	SI	MO	CR	NI	DESCRIPTION

Designed Per ASME Section III Cl. 2 (W75) 1285 psig @ 600°F w/1/16" C.A.

Fabr. Per MPS-B1 R/ 1

Material SA-516-70 w/Impacts Per NC-2300

MT bevel per QSP 4.2.2 R/3 ~ results acceptable

After welding long seam normalized per MPS-C3 R/0
Normalized 1700 ±25°F held at temp. 1 hr per inch A/C ~

After hot forming outlet normalized per MPS-C3 R/0
Normalized 1700 ±25°F held at temp. 1 hr per inch A/C ~

RT long seam per QSP 4.1.4 R/5 ~ results acceptable

After machining, MT bevels per QSP 4.2.2 R/3 ~ results acceptable

PWHT per MPS-C4 R/0
PWHT temperature 1125 - 1175°F Holding Time At Temperature 2-1/2 hrs ~

Rate of heating above 800°F did not exceed 114 °/Hr
Rate of cooling down to 800°F did not exceed 114 °/Hr
From 800°F downward A/C

NUCLEAR

This fitting is certified to meet the requirements of Para. 2.2 of ANSI B16.9-1978.

RI-P# 5075

BECHTEL 743

SUBSCRIBED AND SWORN TO BEFORE ME

MARGARET MAISCH
STATE NOTARY PUBLIC
Miami County, Kansas
My Appointment Expires 9-16-84

1st DAY OF August 19 84

Margaret Maisch
NOTARY PUBLIC

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager

COPY

Southwest Fabricating & Welding Co., Inc.

CUSTOMER

P.O. Box 9449
Houston, TEXAS 77261-9449

CUSTOMER ORDER NO. 2657N-214

PACKING LIST NO.

GW **Taylor Forge Engineered Systems**

P.O. Box B
Paola, KS 66071
913/294-5321

SPECIFICATION NO. SA-234-WPBW

HEAT TREATMENT

OUR ORDER NO. 803450

CERTIFIED MATERIAL TEST REPORT

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s)

The finished product shown was produced in the U.S.A.

NUCLEAR

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ____% OFFSET PSI	PHYSICAL PROPERTIES: TENSILE STRENGTH PSI	PHYSICAL PROPERTIES: ELONG IN ____ %	PHYSICAL PROPERTIES: RED OF AREA %	CHEMICAL ANALYSIS: C	MN	P	S	SI	MO	CR	NI	DESCRIPTION
													Item 2A Pc. 1
KOPV	SEE ATTACHED CMTR FROM BETHLEHEM STEEL COMPANY OUR SERIAL NO. HE-20												

REMARKS:

BECHTEL
743

RIP#5075

GWC

SUBSCRIBED AND SWORN TO BEFORE ME

MARGARET MAISCH
STATE NOTARY PUBLIC
Miami County, Kansas
My Appointment Expires
4-16-86

13TH DAY OF August 1984

Margaret Maisch
NOTARY PUBLIC

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager.

COPY

COPY

48897 (Rev.A 12-77)

BETHLEHEM STEEL CORPORATION CORRECTED 5-8-84
METALLURGICAL DEPARTMENT

CORRECTED 4/26/84

BURNS HARBOR PLANT

REPORT OF TESTS AND ANALYSES

803-07244	4-18-84	MID AMERICAN TRLR 83028	PAGE 1

GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
1ST & IRON STS
PAOLA KS 66071

GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
1ST & IRON STS
PAOLA KS 66071

				SIZE AND QUANTITY							ELONG		
					INCHES	INCHES	INCHES	POUNDS	PSI	PSI	IN	%	
*	PLATES	-	ASME SA516 GR 70 PVQ SUMMER 80 ADD IN ACCORD WITH ASME SECT III MICRO ALLOY ADDITIONS 0.010 MAX SPCL TESTS - SEE MI 66 GAS CUT 4 SIDES MILL TEST PCS NORM & STR REL SEE MI										
	MFST	-	LIFT MAX 10 TON MILL TEST PCS DOUBLE NORM 1800DEG F FOR 5HRS/IN & AIR COOL 1700DEG F FOR 2HRS/IN & AIR COOL STRESS REL 1150DEG F FOR 5 HRS W/114DEG F PER HR HEATING & COOLING RATE ABOVE 800DEG F CVN2332 LONG 35MILS AT + 70DEG F NOTE 203 PLT NO BRK AT + 10F										
	CO# 12-6355 GM 023-43500												
1	A 4889		803A73340	1	3 1/2	95	272	25649	49000	77800	2	30	
					NORMALIZED AT 1800 DEG F - 17.5 HRS - AIR COOLED								
					NORMALIZED AT 1700 DEG F - 7.0 HRS - AIR COOLED								
					S/R AT 1150 DEG F - 5 HRS - HEATING & COOLING RATE 114 DEG F/HR ABOVE 800 DEG F								
	- KOPV HC-20												
	2A1, 2B1												

Q - QUENCH TEMPERATURE T - TEMPER TEMPERATURE N - NORMALIZE TEMPERATURE

* TENSION TEST DIRECTIONALITY : TRANSVERSE
1 MILL DUCTILITY TEST AT +10 DEG F EACH PLATE - NO BREAK
ACCEPTED QA PROGRAM DTD 1/4/82 PER ASME SECT III NCA 3800

RIP#5075

							CHARPY IMPACT												
					INCHES					FT. LBS.			SHEAR (%)			LAT EXP		MIL	
										1	2	3	1	2	3	1	2	3	
A 4889		803A73340			3.500	V	FULL	L	+70	107	107	119	67	74	70	78	79	84	

	CHEMICAL ANALYSIS															
	C	Mn	P	S	Si	Cu										
803A73340	.21	.97	.016	.003	.350	.23										5-8

Received Q.C. MAY - 7 1984

NUCLEAR

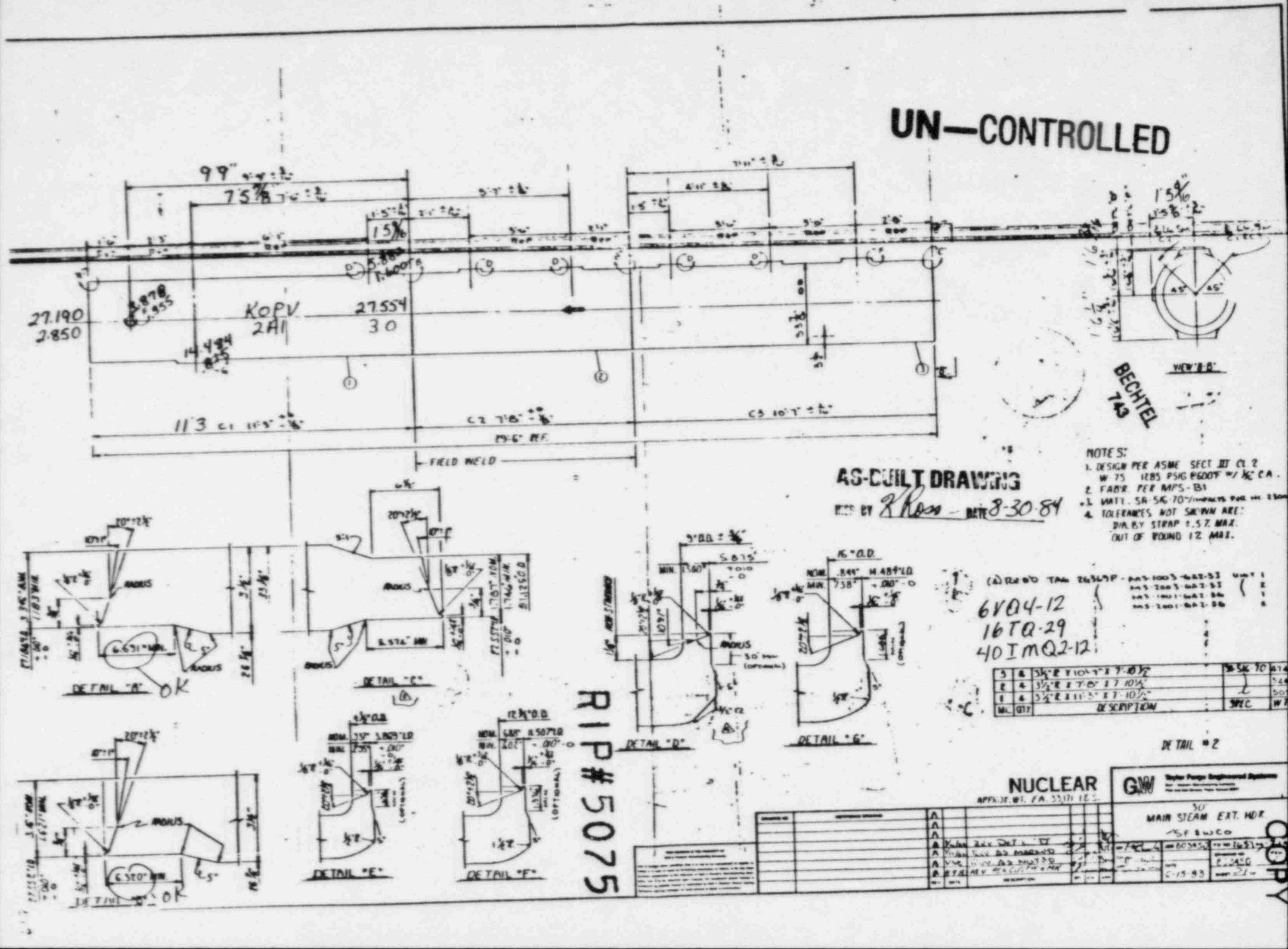
803450

I CERTIFY THAT THE ABOVE RESULTS ARE A TRUE AND CORRECT COPY OF RECORDS PREPARED AND MAINTAINED BY THE COMPANY ...

B.N. BARGERON TAE

BECHTEL
743

44


UN—CONTROLLED
KOPV
2A1
27.190
2.850
27.554
30
FIELD WELD
BECHTEL
743
VIEW "B-B"
NOTES:
1. DESIGN PER ASME SECT III CL 2
2. FABR. PER MPS-B1
3. MATL. SA-516-70
4. TOLERANCES NOT SHOWN ARE:
DIA. BY STRAP ±.5% MAX.
OUT OF ROUND 1% MAX.
AS-BUILT DRAWING
DATE 8-30-84
6VQ4-12
16TQ-29
40IMQ2-12
DESCRIPTION
SPEC
DETAIL "A"
OK
DETAIL "B"
OK
DETAIL "C"
DETAIL "D"
DETAIL "E"
DETAIL "F"
DETAIL "G"
DETAIL #2
RIP#5075
NUCLEAR
MAIN STEAM EXT. HDR.
COPY

COPY

*Added

FORM N-2 MANUFACTURERS DATA REPORT FOR NUCLEAR PARTS AND APPURTENANCES*

As required by the Provisions of the ASME Code Rules

1. (a) Manufactured by Taylor Forge Engineered Systems First & Iron Streets Paola, Kansas 66071 G+W Manufacturing Company
(Name and address of Manufacturer of part)

(b) Manufactured for Southwest Fabricating & Welding Co., Inc. P.O. Box 9449 Houston, Texas 77261-9449
(Name and address of Manufacturer of completed nuclear component)

2. Identification-Manufacturer's Serial No. of Part B03450 2A1 Nat'l Bd. No. ----

(a) Constructed According to Drawing No. B03450 - 2 Drawing Prepared by Taylor Forge Engineered Systems
Sheet D1 Rev. 4 *SA-234-WPBW

(b) Description of Part Inspected Main Steam Ext. Header 11' 3" lg.

(c) Applicable ASME Code: Section III, Edition 1974, Addenda date W75, Case No. --, Class 2

3. Remarks:
(Brief description of service for which component was designed)

Southwest Fabricating & Welding Co., Inc. Approved Material to S 80 Addenda

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the part Manufacturer. An appurtenance Manufacturer is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the component Design Specification and Stress Report.)

Date 8-31 19 84 Signed Taylor Forge Engineered Systems (Manufacturer) By [signature]

Certificate of Authorization Expires 11-25-86 Certificate of Authorization No. N-1937

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

Design information on file at --

Stress analysis report on file at --

Design specifications certified by -- Prof. Eng. State ____ Reg. No. ____

Stress analysis report certified by -- Prof. Eng. State ____ Reg. No. ____

SFAWCO QA 2

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 or Province of Kansas and employed by Hartford Steam Boiler Insp. & Ins. Co. of Hartford, Conn. have inspected the part of a pressure vessel described in this Manufacturer's Partial Data Report on 8-31 1984, and state that to the best of my knowledge and belief, the Manufacturer has constructed this part 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 part described in this Manufacturer's Partial 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.

RIP#5075

Date 8-31 19 84

Edward Erwin
Inspector's Signature

Commissions NB 9989 KS 263
National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in Items 1-2 on this data report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded in Item 3, "Remarks".

BECHTEL
743

-16-

COPY

FORM N-2 (back) B03450 Item 2A1

Items 4–8 incl. to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

4. Shell: Material SA-516-70 (Kind & Spec. No.) 70000 T.S. (Min. of Range Specified) Nominal Thickness 3.346 in. Corrosion Allowance 1/16 in. Dia. 2 ft. 9-7/8 in. Length 11 ft. 3 in.

5. Seams: Long Dbl Butt H.T.[1] Yes R.T. Yes Efficiency 100 %

Girth ____ H.T.[1] ____ R.T. ____ No. of Courses one

6. Heads: (a) Material ____ T.S. ____ (b) Material ____ T.S. ____

Location (Top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a)								
(b)								

If removable, bolts used ____ (Material, Spec. No., T.S., Size, Number) Other fastening ____ (Describe or attach sketch)

7. Jacket Closure: ____ (Describe as ogee and weld, bar, etc. If bar give dimensions, if bolted, describe or sketch)

8. Design pressure[2] ____ psi at ____ °F Drop Weight ____ Charpy Impact ____ ft-lb at temp. of ____ °F

Items 9 and 10 to be completed for tube sections

9. Tube Sheets: Stationary. Material ____ (Kind & Spec. No.) Dia. ____ (Subject to pressure) Thickness ____ in. Attachment ____ (Welded, Bolted)

Floating. Material ____ Dia. ____ Thickness ____ in. Attachment ____

10. Tubes: Material ____ O.D. ____ in. Thickness ____ inches or gage. Number ____ Type ____ (Str. or U)

Items 11–14 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

11. Shell: Material ____ (Kind & Spec. No.) T.S. ____ (Min. of Range Specified) Nominal Thickness ____ in. Corrosion Allowance ____ in. Dia. ____ ft. ____ in. Length ____ ft. ____ in.

12. Seams: Long ____ H.T.[1] ____ R.T. ____ Efficiency ____ %

Girth ____ H.T.[1] ____ R.T. ____ No. of Courses ____

13. Heads (a) Material ____ T.S. ____ (b) Material ____ T.S. ____

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Top, bottom, ends								
(b) Channel								

If removable, bolts used (a) ____ (b) ____ (c) ____ Other fastening ____ (Describe or attach sketch)

14. Design pressure[2] ____ psi at ____ °F Drop Weight ____ Charpy Impact ____ ft-lb at temp. of ____ °F

RIP#5075

Items below to be completed for all vessels where applicable.

15. Safety Valve Outlets: Number ____ Size ____ Location ____

16. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Dia. or Size	Type	Material	Thickness	Reinforcement Material	How Attached

BECHTEL 743

17. Inspection Openings: Manholes, No. ____ Size ____ Location ____ Handholes, No. ____ Size ____ Location ____ Threaded, No. ____ Size ____ Location ____

18. Supports: Skirt ____ (Yes or No) Lugs ____ (Number) Legs ____ (Number) Other ____ (Describe) Attached ____ (Where & How)

[1] W Postweld Heat-Treated.
[2] List other internal or external pressure with coincident temperature when applicable.

Printed in U.S.A. (1/72)

This form (B40) is obtainable from the ASME, 345 E. 47th St., New York, N.Y. 10017

17

FORM NPP-1 DATA REPORT FOR FABRICATED NUCLEAR PIPING SUBASSEMBLIES*
(As Required by the Provisions of the ASME Code Rules)

1. Fabricated by SOUTHWEST FABRICATING & WELDING CO. INC. 7525 SHERMAN, HOU. TX 77011 Order No. S.O.#Q2657-MS
(Name and Address of Fabricator)

2. Fabricated for HOUSTON LIGHTING & POWER CO., HOUSTON, TX. Order No. P.O.#35-1197-6014
(Name and Address)

3. Owner HOUSTON LIGHTING & POWER CO.; SOUTH TEXAS NUCLEAR UNIT I 4. Location of Plant WADSWORTH, TX.

5. Piping System Identification Main Steam, Serial #39721
(Brief description of intended use, main coolant etc.)

(a) Drawing No. Q2657-MS #59 Prepared by SOUTHWEST FAB. & WELDING CO., INC.

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2

Edition 1974 , Addenda Date WINTER 1975 , Case No. ---

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report PIPE - Item (A) Taylor Forge S/N 803450-3A.
(Name of Part – Item number, Manufacturer's name, and Identifying stamp)

7. Shop Hydrostatic Test N/A psi.

8. Description of piping inspected MK: 2G369P-MS-1003-GA2-08-H; SA-155 KCF-70 CL. I Wld'd, 31 1/8" O.D. (1.746" MW) X 11'-11 9/16" lg; SA-350 LF2, 1 1/2" 6000# S/W Bosset.
(include – mark no. – material spec. – nom. pipe size – schedule or thickness – length – fittings – flanges, etc.)

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 9-21-84 Signed SF&WCO By (jh) Manuel Lemmy
(Fabricator)

Certificate of Authorization Expires JULY 23, 1985 Certificate of Authorization No. N-1459

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 or Province of TEXAS and employed by H.S.B.I.&I.Co. HARTFORD, CT have inspected the piping described in this Data Report on 9-21 1984, and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer make any warranty, expressed or implied, concerning the piping 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 9-21, 1984

(Inspector) Commissions TX 370
National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" 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 in item 7, "Remarks".

CUSTOMER Southwest Fabricating & Welding Co.
P.O. Box 9449
Houston, TEXAS 77261-9449

CUSTOMER ORDER NO. 2657N-214

PACKING LIST NO.

G+W **Taylor Forge Engineered Systems**
P O Box B
Paola, KS 66071
913/294-5331

OUR ORDER NO. 803450

COVER SHEET

CERTIFIED MATERIAL TEST REPORT

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s)

SPECIFICATION NO.

HEAT TREATMENT 3A

Main Steam Piping

11' 11-9/16" lg.

The finished product shown was produced in the U.S.A.

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ___% OFFSET PSI	PHYSICAL PROPERTIES: TENSILE STRENGTH PSI	PHYSICAL PROPERTIES: ELONG IN ___" %	PHYSICAL PROPERTIES: RED. OF AREA %	CHEMICAL ANALYSIS: C	Mn	P	S	Si	Mo	Cr	Ni	DESCRIPTION

Designed Per ASME Section III Cl. 2 (W75) 1285 psig @ 600°F w/1/16" C.A.

Fabr. Per MPS-B2 R/ 1

Material SA-516-70 w/Impacts Per NC-2300

MT bevels per QSP 4.2.2 R/3 results acceptable

Normalized Per MPS-C3 R/0 (including tabs)
Normalized 1700 ±25°F held at temp. 1 hr per inch A/C

Tested Per MPS-D1 R/0 acceptable results attached
tests per thk. per heat per ht. trt procedure
check analysis (parent) per SA-155 Para. 7.1
crossweld tensile per SA-155 Para. 10.3
transverse bend tests per SA-155 Para. 9.0

RT long seam per QSP 4.1.4 R/5 results acceptable

MT bevels per QSP 4.2.2 R/3 results acceptable

PWHT Per MPS-C4 R/0
PWHT temperature 1125 - 1175°F Holding Time At Temperature 2-1/2 hrs
Rate of heating above 800°F did not exceed 114 °/hr
Rate of cooling down to 800°F did not exceed 114 °/hr
From 800°F downward A/C

NUCLEAR

2G369P-MS-1003-GA2-3H

S.F.&W.CO. QA 2

BECHTEL 743

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager.

SUBSCRIBED AND SWORN TO BEFORE ME

MARGARET MAISCH
STATE NOTARY PUBLIC
Miami County, Kansas
My Appointment Expires
4-16-86

THIS 24th DAY OF August 1984

Margaret Maisch
NOTARY PUBLIC

Southwest Fabricating & Welding Co., Inc.

CUSTOMER

P.O. Box 9449
Houston, TEXAS 77261-9449

CUSTOMER ORDER NO. 2657N-214

PACKING LIST NO.

GW **Taylor Forge Engineered Systems**

P.O. Box 8
Paola, KS 66071
913/294-5331

OUR ORDER NO. 803450

SA-155 KCF70 Cl. 1 NH
SPECIFICATION NO.

HEAT TREATMENT

CERTIFIED MATERIAL TEST REPORT

Material manufactured/fabricated and tested in accordance with purchase order requirements and specification(s)

The finished product shown was produced in the U.S.A.

NUCLEAR

HEAT NUMBER	PHYSICAL PROPERTIES: YIELD POINT OR YIELD STRENGTH AT ____ % OFFSET PSI	TENSILE STRENGTH PSI	ELONG IN ____" %	RED OF AREA %	CHEMICAL ANALYSIS: C	Mn	P	S	Si	Mo	Cr	Ni	DESCRIPTION
													Item 3A
	SEE ATTACHED CMTR FROM BETHLEHEM STEEL COMPANY OUR SERIAL NO.										HE- 8		
					max.	.80 -	max.	max.	.13 -				
KOPM					.30	1.25	.035	.04	.33				REQUIRED * Parent Per SA-155 Para. 7.1
					.25	.96	.018	.016	.26				
	Min. 38000	70000-90000	Min. 21		REQUIRED Crossweld tensile per SA-155 Para. 10.3								*Per W75
	49529	74294	23	24.7									
	Transverse Bend Tests Per SA-155 Para. 9.0 acceptable												

REMARKS: Tests taken from tab normalized with the product and PWHT per MPS-C4 R/O

BECHTEL 743
GW

MARGARET MAISCH
STATE NOTARY PUBLIC
Miami County, Kansas
My Appointment Expires 2-16-86

SUBSCRIBED AND SWORN TO BEFORE ME THIS 24 DAY OF August 19 84

Margaret Maisch
NOTARY PUBLIC

The undersigned certifies that the contents of this report are correct and accurate and that all above test results and operations performed are in compliance with requirements of the applicable sections of the above stated specifications and purchase order.

For Quality Assurance Manager.

S.D. Chapp

68597 (Rev. A 12-77)

BETHLEHEM STEEL CORPORATION
METALLURGICAL DEPARTMENT

CORRECTED 4-16-84

CORRECTED 4/26/84

REPORT OF TESTS AND ANALYSES

BURNS HARBOR PLANT

DEPARTMENT NO	DATE SHIPPED	CAR OR VESSEL NO	
803-06617	4-6-84	YELLOW FRT TRLR 21626A	PAGE 1

SOLD TO
GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
1ST & IRON STS
PAOLA KS 66071

SHIP TO
GULF & WESTERN MFG CO
ENGINEERED SYSTEMS DIV
1ST & IRON STS
PAOLA KS 66071

ITEM	SERIAL NUMBER	PART NO	HEAT NUMBER	SIZE AND QUANTITY: NO. PCS	THICKNESS INCHES	WIDTH OR DIA INCHES	LENGTH INCHES	WEIGHT POUNDS	YIELD POINT PSI	TENSILE STRENGTH PSI	ELONG %	RED %
M	PLATES -		ASME SA516 GR 70 PVQ WINTER 75 ADD IN ACCORD WITH ASME SECT III									
			MICRO ALLOY ADDITIONS S.010 MAX									
	-	—	SPCL TESTS - SEE MI && GAS CUT 4 SIDES MILL TEST PCS NORM & STR REL SEE MI									
	MFST -		LIFT MAX 10 TON MILL TEST PCS DOUBLE NORM 1800 DEG F FOR 2HRS/IN & AIR COOL 1700 DEG F FOR 1HR/IN & AIR COOL S/R AT 1150 DEG F FOR 5 HRS WITH 188 DEGF/HR HEATING AND COOLING ABOVE 800 DEG F CVN PER NC2331 LONG 25 MILS AT PLUS 40 DEG F									
	CO# 12-5355	GM 023-43508	[redacted]									
A	81981		802A42440	1	2-1/8	91	HE-7 289	15849	49200	75100	2	34
A	81982		802A42440	1	2-1/8	91	HE-8 289	15849	47100	74600	2	34
A	81983		802A42440	1	2-1/8	91	HE-9 258	14149	47800	75400	2	32
					NORMALIZED AT 1800 DEG F - 4-1/4 HRS							
					NORMALIZED AT 1700 DEG F - 2-1/8 HRS							
					S/R AT 1150 DEG F - 5 HRS HEATING AND COOLING RATE							
					188 DEGF/HR ABOVE 800 DEG F							

HE-7 YA, YB
HE-8 3A, 3B
HE-9 5A, 5B

M = MANUFACTURING TEMPERATURE T = TEMPER TEMPERATURE N = NORMALIZED TEMPERATURE

M TENSION TEST DIRECTIONALITY : TRANSVERSE
ACCEPTED QA PROGRAM DTD 1/4/82 PER ASME SECT III NCA 3800

SERIAL NUMBER	PART NO	HEAT NUMBER	HARD	BRND	CHARPY IMPACT: THICKNESS INCHES	TYPE	SIZE	OR	TEST TEMP	ENERGY FT. LBS. 1	2	3	WEAR (%) 1	2	3	LAT EXP MILS 1	2	3
A 81981		802A42440			2.125	V	FULL	L	+40	98	95	106	60	60	65	65	65	68
A 81982		802A42440			2.125	V	FULL	L	+40	105	104	101	60	65	65	67	75	67
A 81983		802A42440			2.125	V	FULL	L	+40	116	103	112	74	67	70	76	67	68

HEAT NUMBER	CHEMICAL ANALYSIS: C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	B	W	Al	Cb	N		INCLUSION GRADE THIN
802A42440	.21	1.02	.013	.008	.244	.286	.24	.20	.062								5-8

[redacted] KOPM

803450 NUCLEAR

I CERTIFY THAT THE ABOVE RESULTS ARE A TRUE AND CORRECT COPY OF THE OFFICIAL RECORDS AND THAT THE MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATION LISTED ABOVE

CHIEF METALLURGIST P. J. DIFFENBACH BY JLK

S.F.&W.CO. QA 2

BECHTEL 743

10

*Added

FORM N-2 MANUFACTURERS DATA REPORT FOR NUCLEAR PART AND APPURTENANCES*

As required by the Provisions of the ASME Code Rules

1. (a) Manufactured by Taylor Forge Engineered Systems First & Iron Streets G+W Manufacturing Company Paola, Kansas 66071
(Name and address of Manufacturer of part)

(b) Manufactured for Southwest Fabricating & Welding Co., Inc. P.O. Box 9449 Houston, Texas 77261-9449
(Name and address of Manufacturer of completed nuclear component)

2. Identification-Manufacturer's Serial No. of Part 803450 3A Nat'l Bd. No. ----

(a) Constructed According to Drawing No. 803450 - 3 Drawing Prepared by Taylor Forge Engineered Systems
Sheet B1 Rev. 3

(b) Description of Part Inspected Main Steam Piping 11' 11-9/16" lg. *SA-155 KCF70 Cl. 1 NH

(c) Applicable ASME Code: Section III, Edition 1974, Addenda date W75, Case No. ----, Class ----

3. Remarks:
(Brief description of service for which component was designed)

We certify that the statements made in this report are correct and this vessel part or appurtenance as defined in the Code conforms to the rules of construction of the ASME Code Section III.
(The applicable Design Specification and Stress Report are not the responsibility of the part Manufacturer. An appurtenance Manufacturer is responsible for furnishing a separate Design Specification and Stress Report if the appurtenance is not included in the component Design Specification and Stress Report.)

Date 8-24 19 84 Signed Taylor Forge Engineered Systems By
(Manufacturer)

Certificate of Authorization Expires 11-25-86 Certificate of Authorization No. N-1937

CERTIFICATION OF DESIGN FOR APPURTENANCE (when applicable)

S.F.&W.CO. QA 2

Design information on file at --

Stress analysis report on file at --

Design specifications certified by -- Prof. Eng. State ---- Reg. No. ----

Stress analysis report certified by -- Prof. Eng. State ---- Reg. No. ----

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 or Province of Kansas and employed by Hartford Steam Boiler Insp. & Ins. Co. of Hartford, Conn. have inspected the part of a pressure vessel described in this Manufacturer's Partial Data Report on 8-24 19 84, and state that to the best of my knowledge and belief, the Manufacturer has constructed this part 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 part described in this Manufacturer's Partial 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 8-24 19 84

Edward Erwin Commissions NB 9989 KS263
Inspector's Signature National Board, State, Province and No.

*Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" x 11", (2) information in items 1-2 on this data report is included on each sheet, and (3) each sheet is numbered and number of sheets is recorded in item 3, "Remarks".

BECHTEL 743

32

FORM N-2 (back) 803450 Item 3 A

Items 4–8 Incl. to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

4. Shell: Material SA-516-70 (Kind & Spec. No.) T.S. 70000 (Min. of Range Specified) Nominal Thickness .787 in. Corrosion Allowance 1/16 in. Dia. 2 ft. 7-1/8 in. Length 11 ft. 11-9/16" in.

5. Seams: Long Dbl Butt H.T.[1] Yes R.T. Yes Efficiency 100 %

Girth ____ H.T.[1] ____ R.T. ____ No. of Courses one

6. Heads: (a) Material ____ T.S. ____ (b) Material ____ T.S. ____

Location (Top, bottom, ends)	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a)								
(b)								

If removable, bolts used ____ (Material, Spec. No., T.S., Size, Number) Other fastening ____ (Describe or attach sketch)

7. Jacket Closure: ____ (Describe as ogee and weld, bar, etc. If bar give dimensions, if bolted, describe or sketch)

8. Design pressure[2] ____ psi at ____ °F Drop Weight ____ Charpy Impact ____ ft-lb at temp. of ____ °F

Items 9 and 10 to be completed for tube sections

9. Tube Sheets: Stationary, Material ____ (Kind & Spec. No.) Dia. ____ (Subject to pressure) Thickness ____ in. Attachment ____ (Welded, Bolted)

Floating. Material ____ Dia. ____ Thickness ____ in. Attachment ____

10. Tubes: Material ____ O.D. ____ in. Thickness ____ inches or gage. Number ____ Type ____ (Su. or U)

Items 11–14 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

11. Shell: Material ____ (Kind & Spec. No.) T.S. ____ (Min. of Range Specified) Nominal Thickness ____ in. Corrosion Allowance ____ in. Dia. ____ ft. ____ in. Length ____ ft. ____ in.

12. Seams: Long ____ H.T.[1] ____ R.T. ____ Efficiency ____ %

Girth ____ H.T.[1] ____ R.T. ____ No. of Courses ____

13. Heads (a) Material ____ T.S. ____ (b) Material ____ T.S. ____

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Press. (Conv. or Conc.)
(a) Top, bottom, ends								
(b) Channel								

If removable, bolts used (a) ____ (b) ____ (c) ____ Other fastening ____ (Describe or attach sketch)

14. Design pressure[2] ____ psi at ____ °F Drop Weight ____ Charpy Impact ____ ft-lb at temp. of ____ °F

G.E.,S.W.CO. QA 2

Items below to be completed for all vessels where applicable.

15. Safety Valve Outlets: Number ____ Size ____ Location ____

16. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Dia. or Size	Type	Material	Thickness	Reinforcement Material	How Attached

BECHTEL 743

17. Inspection Openings: Manholes, No. ____ Size ____ Location ____ Handholes, No. ____ Size ____ Location ____ Threaded, No. ____ Size ____ Location ____

18. Supports: Skirt ____ (Yes or No) Lugs ____ (Number) Legs ____ (Number) Other ____ (Describe) Attached ____ (Where & How)

[1] If Postweld Heat-Treated.
[2] List other internal or external pressure with coincident temperature when applicable.

Printed in U.S.A. (1/72) This form (S40) is obtainable from the ASME, 345 E. 47th St., New York, N.Y. 10017

33

Feedwater Pipe

D34

FORM NPP-1 DATA REPORT FOR FABRICATED NUCLEAR PIPING SUBASSEMBLIES*
(As Required by the Provisions of the ASME Code Rules)

1. Fabricated by SOUTHWEST FABRICATING & WELDING CO. INC. 7525 SHERMAN, HOU. TX 77011 (Name and Address of Fabricator) Order No. S.O.#Q2657-FW

2. Fabricated for HOUSTON LIGHTING & POWER CO., HOUSTON, TX. (Name and Address) Order No. P.O.#35-1197-6014

3. Owner HOUSTON LIGHTING & POWER CO.; SOUTH TEXAS NUCLEAR UNIT I 4. Location of Plant WADSWORTH, TX.

5. Piping System Identification Feedwater, Serial #38885 (Brief description of intended use, main coolant etc.)

(a) Drawing No. Q2657-FW #17 Prepared by SOUTHWEST FAB. & WELDING CO., INC.

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2

Edition 1974, Addenda Date WINTER 1975, Case No. ---

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report N/A (Name of Part — Item number, Manufacturer's name, and identifying stamp)

7. Shop Hydrostatic Test N/A psi.

8. Description of piping inspected MK: 2G369P-FW-1012-GA2-02-L; SA-333 Gr. 6 Sml's, (Include — mark no. — material spec. — nom. pipe size — schedule or thickness — length — fittings — flanges, etc.)

18" (.938" W) 2'-8 5/16" long; SA-350 LF2, 18" (Sch. 80) X 3" (Sch. 160) W-O-L; SA-350 LF2, 18" X 1" 3000# S-O-L.

RIP # 4278

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 8-17-84 Signed SF&WCO (Fabricator) By (1h) Mario Pessoa

Certificate of Authorization Expires JULY 23, 1985 Certificate of Authorization No. N-1459

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 or Province of TEXAS and employed by H.S.B.I.&I.Co. of HARTFORD, CT have inspected the piping described in this Data Report on 8-17 19 84, and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer make any warranty, expressed or implied, concerning the piping 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 8-17, 19 84 Signed Lloyd Cobb (Inspector) Commissions TX, 925 National Board, State, Province and No.

* Supplemental sheets in form of lists, sketches or drawings may be used provided (1) size is 8½" 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 in item 7, "Remarks".

JOB., CONTRACT NO. 92940-00N

SHIPPERS NO. | MILL ORDER NO. GT 79445 | INVOICE NO. 356-07106

VEHICLE IDENTITY

SHIP TO

YSES AND/OR TEST RESULTS SHOWN IN THIS RE-
PORT ARE CORRECT AS CONTAINED IN THE
RECORDS OF THE COMPANY.

SIGNATURE E J Merbert

DATE October 23, 1978

National 78

Capitol Pipe and Steel Products

18" X .938 Wi. 6

Pipe : 18" S/80

Low Temp

Seamless Pressure Pipe

Normalized 1600°F for 118 Minutes, Air Cooled

SA 333-GR. 6.

2752 Longitudinal Tensile Tests

STATE OF PENNSYLVANIA

COUNTY OF ALLEGHENY

SUBSCRIBED AND SWORN TO BEFORE ME

THIS 23rd DAY OF October 19 78

Elizabeth Ann Gallagher

NOTARY PUBLIC

MY COMMISSION EXPIRES

MATERIAL DESCRIPTION			MATL	HEAT/ LOT NO.	MIN. HYDRO PSI	YIELD STR. PSI	TENSILE STR. PSI	ELONG. % IN 2"	GAGE WIDTH IN.	FLAT	BEND
SIZE	WALL	SPECIFICATION & GRADE									
18" ✓	.938"	ASTM A-333 6 ASME SA-333 ✓ 6 ✓	Smls.	A63121 A63121 ✓	2200 2200	47780 44570 ✓	72910 72360 ✓	53.0 52.0 ✓	1½" 1½"	OK OK	✓

CAPITOL PIPE
QUALITY
ASSURANCE
3
ACCEPTED 10/23/78

FULL SIZE LONGITUDINAL CVN IMPACTS AT MINUS 50°F ✓

NO.	HEAT NO.	TYPE	C	MN	P	S	SI	CU	NI	CR	MO
	A63121 ✓	Prod	18	1 23	013	012	14				
		Prod	19	1 23	013	014	14				
		Heat	20	1 22	012	014	12				

	FT. LBS.	% SHEAR	LAT
A63121 ✓	52	48	.045
	48	43	.044
	27	36	.052

FULL SIZE LONGITUDINAL CVN IMPACTS AT PLUS 40°F ✓

A63121 ✓	96	85 ✓	.082
	101	100 ✓	.084
	102	100 ✓	.085

RIP # 42278

"This material was manufactured in accordance with the Quality Assurance Program as audited by Capitol Pipe and Steel Products on 9/9/77"

E J Buechler

Chief Metallurgist
United States Steel Corporation, National-Duquesne Works

PAGE 1 OF 1

Southwest Fab
P.O. #6181N-12
S.O. #HN-2093-A8
Item 1
#93006

COPY

WFI
NUCLEAR PRODUCTS, INC.
INTERNATIONAL
7405 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-3633
☐

NUCLEAR PRODUCTS
4407 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-2835
☒

SOLD TO
SOUTHWEST FABRICATING & WELDING
PO BOX 9449
HOUSTON, TEXAS 77011

SA-350/LF-2

L/1" 6000# S-O-L

CUSTOMERS ORDER NO. 2657N-279

WFI NO. N-1677 DATE 3/29/84

CERTIFIED MATERIAL TEST REPORT

RRECTED

S MATERIAL IS FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ASME SECTION II, PART A, ERIAL SPECIFICATION REFERENCED AND ASME SECTION III, CLASS 2, 1974 EDITION THRU WINTER 75 ADDENDA. THIS MATERIAL WAS MANUFACTURED AND PROCESSED IN ACCORDANCE WITH THE QUALITY STEMS REQUIREMENTS OF SECTION III, SUBSECTION NCA3800/NA3700. 10 CFR PART 21 APPLIES.

EM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
	16	18" x 1" 3M# SW PIPET	SA350-LF2	863AN
	16	3" x 1" 6M# SW PIPET	SA350-LF2	863AN

RIP # 4278

CHEMICAL COMPOSITION

AT CODE	MILL NO.	C	MN	P	S	SI	NI	CR	MO			
3AN	WFI ANALYSIS	.28	1.02	.010	.018	.25						

COPY

MECHANICAL PROPERTIES

AT CODE	TENSILE PSI	YIELD PSI	ELONG %	RA %	HARDNESS
63AN	90,449	65,689	33.9	70.8	179
	CVN -50°F	99/134/136	FT LBS.		

We certify that the material furnished on this order complies in all respects with the specifications as stated and that this correct information is as contained in our records.

WFI, Inc.

Virgil Kellogg Q.A. DEPT.

Subscribed before me this 3RD day of APRIL, 19 8(

NOTARY PUBLIC - HARRIS COUNTY, TEXAS

EAT TREATMENT 863AN - AUSTENITIZED AT 1650°F FOR 2-1/2 OURS AND WATER QUENCHED. TEMPERED AT 1100°F FOR 1 HOUR ND COOLED IN STILL AIR.

SJAWCO. QA 2

Q.S.C. #425
Expiration Date: 1/16/87

Virgil Kellogg
Richard Ivel
8/22/84

FI 018

84

WFI®

NUCLEAR PRODUCTS, INC.

INTERNATIONAL
4405 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-3633
☐

NUCLEAR PRODUCTS
4407 HAYGOOD
P.O. BOX 7303
HOUSTON, TEXAS 77248
(713) 695-2835
☒

50 Law Imp

SOLD TO: SOUTHWEST FABRICATING & WELDING
PO BOX 9449
HOUSTON, TEXAS 77011

A 350/LF-2
L 3" W-O-L

CUSTOMERS ORDER NO. 2657N-279

WFI NO. N-1677 DATE 3/29/84

CERTIFIED MATERIAL TEST REPORT

HIS MATERIAL IS FURNISHED IN ACCORDANCE WITH THE REQUIREMENTS OF ASME SECTION II, PART A, ATERIAL SPECIFICATION REFERENCED AND ASME SECTION III, CLASS 2, 1974 EDITION THRU WINTER 975 ADDENDA. THIS MATERIAL WAS MANUFACTURED AND PROCESSED IN ACCORDANCE WITH THE QUALITY YSTEMS REQUIREMENTS OF SECTION III, SUBSECTION NCA3800/NA3700. 10 CFR PART 21 APPLIES.

TEM	QUANTITY	DESCRIPTION	MATERIAL	HEAT CODE
	8	18" (S/120) x 3" S/160 BW PIPET	SA350-LF2	940AN
	8	18" (S/80) x 3" S/160 BW PIPET	SA350-LF2	940AN

RIP # 4278

CHEMICAL COMPOSITION

EAT CODE	MILL NO.	C	MN	P	S	SI	NI	CR	MO			
140AN	WFI ANALYSIS	.30	.82	.008	.039	.16						

COPY

MECHANICAL PROPERTIES

EAT CODE	TENSILE PSI	YIELD PSI	ELONG %	RA %	HARDNESS
940AN	75,089	45,662	33.7	57.9	137
	CVN -50°F	32/28/30 FT	LBS.		

EAT TREATMENT: 940AN - NORMALIZED AT 1650°F FOR 5-1/4 HOURS AND COOLED IN STILL AIR.

S.F.&W.CO. QA 2

D.A. Temple
Technical Engineer
3/22/84

We certify that the material furnished on this order complies in all respects with the specifications as stated and that this correct information is as contained in our records.

WFI, Inc.

Virgil Kellogg Q.A. DEPT.

Subscribed before me this 29th day of MARCH, 1984

Sandra L Wylie
NOTARY PUBLIC - HARRIS COUNTY, TEXAS
SANDRA L WYLIE
Notary Public in and for the State of Texas
My Commission Expires July 13, 1985

Q.S.C. #425
Expiration Date: 1/16/87

8

Main Steam Isolation Valve

W6B/37EA/jj

FOR INFORMATION ONLY

RIR878

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

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

1. Manufactured by Atwood & Morrill Co., Inc. Salem, MA
(Name and Address of Manufacturer)
2. Manufactured for Westinghouse Electric Corp. Pittsburgh, PA
(Name and Address of Purchaser or Owner)
3. Location of Installation South Texas Project 1 Palacois, Texas
(Name and Address)
4. Pump or Valve Valve. Nominal Inlet Size 30" (inch) Outlet Size 30"

	(a) Model No., Series No. or Type	(b) Manufacturers' Serial No.	(c) Canadian Registration No.	(d) Drawing No.	(e) Class	(f) Nat'l. Bd. No.	(g) Year Built
(1)	30" Main Steam Isolation Valve	1-13839	N/A	13839-01-H Rev. 6	2	N/A	1978
(3)							
(4)							
(5)							
(6)							
(7)							
(8)							
(9)							
(10)							

5. For service in Main Steam Piping System
(Brief description of service for which equipment was designed)

6. Design Conditions 1300 (Pressure) psi 600 (Temperature) °F or Valve Pressure Class (1)
7. Cold Working Pressure 1500 psi at 100°F.
8. Pressure Retaining Pieces

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
Body	SA 216, GR. WCB	Atwood& Morrill LTD	S/N 1-13839
HT #162			
RT #J1866			
(b) Forgings			
Poppet	SA 105	Cann & Saul	S/N 1-13839
HT #216057			
Cover	SA 105	Cann & Saul	S/N 1-13839
HT #6016006			
Pilot Poppet	SA 182, GR. F-6	Cann & Saul	S/N 1-13839
HT #3034496			

(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.

(1/76) This form (E00037) may be obtained from the Order Dept., ASME, 345 E. 47 St., New York, N.Y. 10017

9 b 0 1 7 7

FOR INFORMATION ONLY

FORM NPV-1 (Back)

RIR878

Mark No.	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
Cover Stids	SA 540, GR. B-23	Jos. Dyson & Sons	HT #114908 Code C-105A1
Cover Nuts	SA 540, GR. B-23	Jos. Dyson & Sons	HT #114908 Code C-87A
(d) Other Parts			

9. Hydrostatic test Shell 2250 psi. Disc. 1300

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 Summer 1975 (Date), Code Case No. N/A. Date N/A

Signed Atwood & Morrill Co., Inc. (Manufacturer) by Walter F. Emerson QC MGR 20Apr78

Our ASME Certificate of Authorization No. N1766 to use the N (N) (NFV) symbol expires 5/20/80 (Date).

CERTIFICATION OF DESIGN

Design information on file at Westinghouse Electric Corp., Pittsburgh, PA

Stress analysis report (Class 1 only) on file at N/A

Design specifications certified by (1) Henry P. Leonard

PE State Penn. Reg. No. 23938-E

Stress analysis certified by (1) N/A

PE State N/A Reg. No. N/A

(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 Massachusetts and employed by H.S.B.I. & I. CO. of Hartford, CT have inspected the pump, or valve, described in this Data Report on April 21st 1978, and state that to the best of my knowledge and belief, the Manufacturer 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 April 21st 1978

J. Line (Inspector) Commissions Mass. 1196 (Nat'l Bd., State, Prov. and No.)

ATWOOD & MORRILL LTD

manufacturers of large high-integrity steel castings

[redacted]
CANADA, E3L 1M5
(506)466-3000

Body for 30"

Customer	Purchase Order No.	A&M Ltd. Sales No.
Atwood & Morrill Co., Inc.	6617	176-1107-24

Pattern No.	Serial No.	Part Name
16674	8	30" MSIV Body

Material Spec. & Grade	Heat No.	RT. No.
ASME SA216 WCB	162	

Nuclear Class	No. of pieces	DWG. No.
2	1	30148-007 H Rev. 1

Source Inspection

MATERIAL TEST REPORT

HEAT NO.	C	Mn	Si	P	S	Cr	Ni	Mo		
162	.25	.76	.42	.026	.012					

Yield P.S.I.	Tensile P.S.I.	Elong. %	Red. of Area %	Brinnell Hardness		
46,907	75,515	31	61.3			

REMARKS: CHARPY V NOTCH IMPACT TEST

Test Temp. (°F)	Energy Absorption (Ft.-Lbs)	Lateral Expansion (In)	Shear Fracture (%)
60	38, 30, 40	.035, .027, .035	10

REPORT OF
CHEMICAL & PHYSICAL
ACCEPTED

BY D E Sharp

DATE 9/19/77

ATWOOD & MORRILL CO. INC.
Quality Assurance

"I CERTIFY THE ABOVE INFORMATION IS CORRECT"
ATWOOD & MORRILL LTD.

A&M Q.C. 3 A 9-1-77

BY [signature]
METALLURGIST

APPROVED
DATE 10/14/77
BY [signature]
O.A.
ATWOOD & MORRILL CO. INC.

EAH 4/13/78

FOR INFORMATION ONLY
Ref. 13839-7

ATWOOD & MORRILL LTD.

manufacturers of large high-integrity steel castings

ST. STEPHEN, NEW BRUNSWICK
CANADA, E3L 1N5
(506)466-3000

Customer	Purchase Order No.	A&M Ltd. Sales No.
Atwood & Morrill Co., Inc.	6617	176-1107-04

Pattern No.	Serial No.	Part Name
16674	8	30" MSIV Body

Material Spec. & Grade	Heat No.	RT. No.
ASME SA216 WCB	162	

Nuclear Class	No. of pieces	DWG. No.
2	1	30148-007 H Rev. 1

Source Inspection

HEAT TREATMENT RECORD

PROCESS*	N	T	
PROCEDURE	4-1107-00 3-23-77	4-1107-00 3-23-77	
DATE	6-5-77	6-5-77	
FURNACE	1	1	
CHARGE NO.	126	126	
CHARGE TEMP.	70°F	200°F	
TIME TO EQUIL. TEMP.	9 1/2 hrs.	8 1/2 hrs.	
HOLDING TEMP. (RANGE)	1660 - 1685	1130 - 1165	
TIME AT TEMP.	9 hrs.	8 hrs.	
COOLING DATA	Air Cool to 400°F	Air Cool	

REMARKS:

* ACTUAL HEAT TREAT CHARTS ARE RETAINED IN FILE FOR THE ABOVE.

*N = Normalize or homogenize
Q = Quench or harden
T = Temper
SA = Solution Anneal
PWHT = Post Weld Heat Treat (Stress relieve)

PREPARED BY K Evans
ATWOOD & MORRILL LTD

TITLE Metallurgist

DATE September 1, 1977

Form T-14

FOR INFORMATION ONLY 13836 5a

CANN & SAUL STEEL CO. A&M 5/N1-4

ROYERSFORD, PA. 19468

Report of Physical Tests and/or Chemical Compositions

Date 3/21/78 REVISED REPORTS FROM REPORTS DATED 3/11/77

Customer's Order No. Cann & Saul Order No.

Customer ATWOOD & MORRILL CO., INC. AM-4837 39285

Address 285 CANAL ST. REF.#13839-01-002
SALEM, MASS. 01970

Attention PURCHASING DEPT.

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CB		
216057	.27	.91	.014	.018	.17						

Lab. No.

PHYSICAL TESTS

CUT FROM	TEST NUMBER	GAUGE	YIELD PT. LBS.	YIELD PER Square In Lbs.	BROKE AT LBS.	ULTIMATE TENSILE LBS.	ELONG %	REDUCED AREA	Reduction %	B.H.N.
			YS	YS.2%						
FORGING 39285	1	.505	8,700	43,500	16,400	83,000	34.0	.074	63.0	167/1
CHARPY IMPACTS		45 40 45 MILS LAT. EXP. @ +60°F								
"V" NOTCH		50 45 49 FT. LBS.								
		40 40 40 PERCENT SHEAR								

OTHER TESTS

SONIC A388, REV. 23 (7/9/75) & ADD. FOR POPPETS (6/8/76) ACCEPTABLE
MAG. PART. B&PV #15 (9/9/75) ACCEPTABLE HEAT TREAT. PROC. #5D(3/5/76) & ADD.
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 MATERIALS SPECIFICATIONS AND THE ASME CODE, SECTION III JULY 1, 1974 EDITION AND THROUGH AND INCLUDING 1975 SUMMER ADDENDA.

Customer's Specifications: ASME SA105
CHARPY "V" IMPACT 25 MILS LAT. EXP. @ +60°F

B.H.N. 187 MAX.

XXX 36,000 YS.2%
T. 70,000
E. 22%
R. 30%

THE ABOVE TESTS COVER THE FOLLOWING MATERIAL:

4 - POPPET FORGINGS PER DRAWING 30521-805D, REV. 1 ON DRAWING 21595-F, REV. 2

FORGINGS SERIALIZED #1,2,4 & 6

A & M
Inspection

Inspector

APPROVED
DATE 3-23-78
BY O.A.
ATWOOD & MORRILL CO., INC.

CANN & SAUL STEEL CO.

Eng. of Tests

Reviewed by HE ANE
5-25-75 AP 7/23/75

SHARON STEEL CORPORATION

METALLURGICAL TEST REPORT

FOR INFORMATION ONLY

September 10, 1976

CUSTOMER

Cann & Saul Steel Company

STREET ADDRESS	CITY & STATE	ZIP CODE

MILL ORDER	0785-28-3796-00
CUST. ORDER	9843 A
SIZE	26.000 x 26.000 x 167.00"
DESCRIPTION	Semi-Finish C FQ
SPECIFICATION	A-105 C 1029 M
HEAT NO.	216057
CARBON	.27
MANGANESE	.91
PHOSPHORUS	.014
SULPHUR	.018
SILICON	.17
NICKEL	.07
CHROMIUM	.10
MOLYBDENUM	.01
VANADIUM	nil
COPPER	.18
GRAIN SIZE	7-8
MACRO	
JOMINY	
ROCKWELL	
BRINELL	
LSEN	
BEND	
YIELD P S I	
ULTIMATE P S I	
ELONGATION %	
REDUCTION AREA %	

SS-3164

METALLURGIST

A&M Q.C. 8 A 3-9-77

FOR CHIEF METALLURGIST
SHARON STEEL CORPORATION

SEP 10 1976

FOR INFORMATION ONLY

10/11/76 H.T. Proc. #5D(3/5/76)& Add.
1550°F - 16 Hrs. Quench in Water
Atwood & Morrill Co., Inc.
AM-4837
4 - Poppet Forgings per Dwg. 30521-805D, Rev. 1 on Dwg. 21595-F, Rev. 2

Forgings serialized #1,2,4 & 6
Heat No. 216057

Cann & Saul Steel Co.

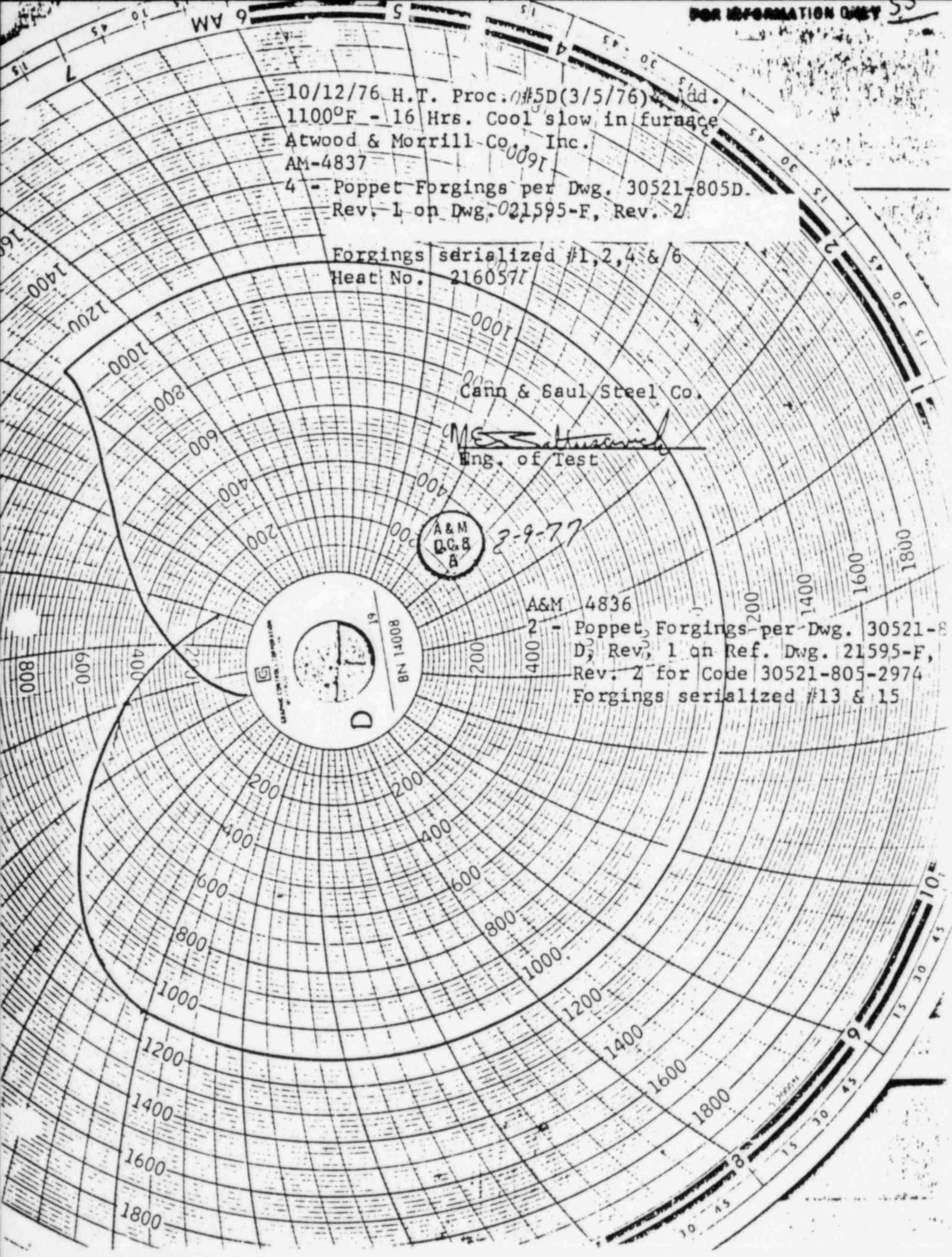
M E Beltsworth
Eng. of Test

A&M D.O.B A 3-9-77

AM-4836
2 - Poppet Forgings per Dwg. D, Rev. 1 on Ref. Dwg. 21 Rev. 2 for Code 30521-80
Forgings serialized #13

1550 H 16 Q

BN 14008


FOR INFORMATION ONLY
10/12/76 H.T. Proc. #5D(3/5/76) Add.
1100°F - 16 Hrs. Cool slow in furnace
Atwood & Morrill Co., Inc.
AM-4837
4 - Poppet Forgings per Dwg. 30521-805D.
Rev. 1 on Dwg. 21595-F, Rev. 2
Forgings serialized #1,2,4 & 6
Heat No. 216057
Cann & Saul Steel Co.
Eng. of Test
A&M D.C.S A
2-9-77
A&M 4836
2 - Poppet Forgings per Dwg. 30521-8
D, Rev. 1 on Ref. Dwg. 21595-F,
Rev. 2 for Code 30521-805-2974
Forgings serialized #13 & 15

FOR INFORMATION ONLY

Form T-14

CANN & SAUL STEEL CO.

A&M S/N 1-4

ROYERSFORD, PA. 19468

Report of Physical Tests and/or Chemical Compositions

Date 1/27/78 REVISED REPORTS FROM REPORTS DATED 12/16/76

Customer ATWOOD & MORRILL CO., INC.
285 CANAL ST.
Address SALEM, MASS. 01970

Customer's Order No. AM-4837
REF.#13863-01-005(4)2
#13839-01-005(2)4

Cann & Saul Order No. 39284

RECEIVED
JAN 30 1978
ATWOOD & MORRILL

Attention PURCHASING DEPT.

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CB
6016006	.30	1.05	.015	.020	.30				

PHYSICAL TESTS

Lab. No.

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.
			YS	YS.2%						
FORGING	39284 1	.505	11,500	57,500	18,200	91,000	30.0	.068	66.0	174/1
CHARPY IMPACTS "V" NOTCH		47 46 52 56 30 30	48 MILS LAT. EXP. @ +60°F 56 FT. LBS. 30 PERCENT SHEAR							

REPORT OF CHEMICAL & PHYSICAL ACCEPTED
BY W. Francis
DATE 2-1-78
ATWOOD & MORRILL CO. INC.
Quality Assurance

OTHER TESTS

SONIC A388, REV. 23 (7/9/75) + ADD. FOR COVERS (6/8/76) ACCEPTABLE
MAG. PART. B&PV #15 (9/9/75)
HEAT TREAT. PROC. #5D (3/5/76) & ADDENDUM
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 MATERIALS SPECIFICATION AND THE ASME CODE SECTION III, JULY 1, 1974 EDITION THROUGH AND INCLUDING 1975 SUMMER ADDENDA.

Customer's Specifications: ASME SA105
CHARPY "V" IMPACT 25 MILS LAT. EXP. @+60°F

22/35 CARBON B.H.N. 187 MAX.

XXX 36,000 YS.2%
T. 70,000
E. 22%
R. 30%

THE ABOVE TESTS COVER THE FOLLOWING MATERIAL:

6 - COVER FORGINGS PER DWG. 30429-002-D, REV. 0 ON DRAWING 21714-F, REV. 0
FORGINGS SERIALIZED #1 THRU 6

A & M
Inspection

Inspector

APPROVED
DATE 2/1/78
BY O.A.
ATWOOD & MORRILL CO. INC.

CANN & SAUL STEEL CO.

C Bowers
Eng. of Tests

A/F Reviewed
W P 2/3/78

G8703 ... 4/7/76

FOR INFORMATION ONLY

Republic Steel Corporation
Cleveland OH 44101

66

Republicsteel

	CONTROL CARD	REQ. JOB CONTRACT NO	PURCHASE ORDER DATE	PURCHASE ORDER NO	RELEASE
57552	057554		03/17/76	9824A	

CERTIFICATE OF TESTS

DMS RATING	RENEGO	CUSTOMER IDENTIFICATION	REPUBLIC ORDER NO. DIST / NUMBER / MFG	ITEM NO
			05-31984-A-30374	

TEAM	MAIL	OFFICE DIST / SLM	INVOICE DATE	INVOICE NUMBER
411	5	05 / 2		503-11398

LE	ACCOUNT NUMBER	TERMS
C	12564001	30-1/2-10

SOLD TO:
CANNIE SAUL STEEL CO
ROYERSFORD PA 19468

SHIP TO:

DATE SHIPPED	FROM	ROUTE/VEHICLE IDENTIFICATION
4/1/76	SO CHGO	WILSON FREIGHT

I HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS

ITEM NO.	MATERIAL DESCRIPTION		%	QUANTITY SHIPPED
	SEMI FINISH CARBON GRADE-1029 MOD SI 15/30 FINE GRAIN FORGING Q NO GUAR SOUND CENTERS RAG PRODUCT DIAMOND SECTION UP TO 2-1/2 TO 3 IN OUT OF SQUARE			
04	23-7/8 X 23-7/8 X INGOT RUNOUT 2 PCS 6016006 3'2"/3'7"	P		33530#
	SEMI FINISH CARBON GRADE-1029 MOD SIL 15/30 FINE GRAIN FORGING Q			
01	16 X 16 X INGOT RUNOUT 1 PCE 6016006 25'4"	P		22000#
				------ 55530#

4/2

R. Malecki

5/8-7

ANALYSIS

ITEM NO	HEAT NO.	GRAIN	CARBON	MANG	PHOS	SUL	SIL	COPPER	NICKEL	CHROME	MOLY	VAN	Cb
	6016006	F	.30	1.05	.015	.020	.30	.02	.08	.03	.02	AL.0	43

TEST RESULTS

ITEM NO	HEAT NUMBER	TEST OR PIECE IDENTITY NO.	YIELD PSI	TENSILE STRENGTH PSI	ELONG 2	ELONG 8	% RED AREA	BEND TEST	HARDNESS

APR 7 - 1976

FOR INFORMATION ONLY 67

10/13/76 H.T. Proc. #66(8/15/75)
1550°F - 11 Hrs. Quench in Water
Atwood & Morrill Co., Inc.
AM-1635 G.E. 205-AF-779
8 - Poppet Forgings per Dwg. 30521-604-D(No Rev.) for
Code 30521-604-2974
Forgings serialized #10 thru 17
Heat No. 215217

A&M Q.C.B. A 12-13-76

Cann & Saul Steel Co.

M E Baltusavich
Eng. of Test

Heat Treat Proc. #5D(3/5/76)
Atwood & Morrill Co., Inc.
AM-4837 Ref. #13863-01-005(4) 13869-01-005(2)
6 - Cover Forgings per Dwg. 30429-002-D, Rev. 0 on Dwg.
21714-F, Rev. 0
Forgings serialized #1 thru 6
Heat No. 6016006

M E Baltusavich

A&M Q.C.B. A 12-14-76

FOR INFORMATION ONLY

10/15/76 Heat Treat. Proc. #5D(3/5/76)
1100°F - 10 Hrs. Cool Slow in Furnace
Atwood & Morrill Co., Inc.
AM-4837 Ref. #13863-01-005(4) 13869-01-005(2)
6 - Cover Forgings per Dwg. 30429-002-D, Rev. 0
on Dwg. 21714-F, Rev. 0
Forgings serialized #1 thru 6
Heat No. 6016006

Cann & Saul Steel Co.

M E Baltusavich
Eng. of Test

A&M R.C.8 A

12-14-76

NOON

6 AM

Form 1-14

CANN & SAUL STEEL Co. FOR INFORMATION ONLY

ROYERSFORD PA 19468

Report of Physical Tests and/or Chemical Compositions

to

		Customer's Order No.	Cann & Saul Order No.
Customer	Atwood & Morrill Co., Inc.	AM-4837	39275
Address	285 Canal St. Salem, Mass. 01970	Ref. #13839-01-007(4) 13863-01-007(2)	
Attention	Purchasing Dept.		

1-31-77 EWH

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CB		
8034496	.112	.52	.016	.005	.12	11.85	.34				

Lab. No.

PHYSICAL TESTS

CUT FROM	TEST NUMBER	GAUGE	YIELD PT. LBS.	YIELD PER Square In Lbs.	BROKE AT LBS.	ULTIMATE TENSILE LBS.	ELONG %	REDUCED AREA	Reduction %	B.H.N.
			YS	YS .2%						
Forg-ing	39275 1	.505	14,400	72,000	18,800	94,000	26.0	.060	70.0	197/20
Charpy Impacts "V" Notch			48 64 59 Mils Lat. Exp. @ +60°F 79 82 77 Ft. Lbs. 25 30 30 percent shear							

CHEMICAL & PHYSICAL REPORT CHECKED

BY W.S. Francini

DATE 12-28-76

ATWOOD & MORRILL CO. INC.

OTHER TESTS

Sonic A388, Rev. 23(7/9/75)
M.P. D&PV #15(9/9/75)
Heat Treat. Proc. #F-6B(8/25/75) and Addendum
We certify that the contents of this report are correct and accruate and that all operations performed by our company or subcontractors are in compliance with materials specification and the ASME Code Section III, July 1, 1974 Ed. through & including 1975 Summer addenda.

Customer's Specifications: ASME SA182, Gr. F-6

Charpy "V" Impact 25 Mils Lat. Exp. @ +60°F

Type 410 SS B.H.N. 223 Max.

XXX 55,000 YS .2%
T. 85,000
E. 25%
R. 50%

THE ABOVE TESTS COVER THE FOLLOWING MATERIAL:

6 - Pilot Poppet Forgings for Dwg. 24545-B, Rev. 1 for Code 15902-301-0097
Forgings serialized #1 thru 6

REVIEWED BY ANI DATE SEP. 19 1977 N.S.U.T.C.O.

A&M

Inspection

Inspector

12-14-76

CANN & SAUL STEEL CO.

Engr. of Tests

OB 01 CA 00 10/75

Republic steel

FOR INFORMATION ONLY
Cleveland OH 44101

76

NLM

CONTROL CARD	REQ JOB CONTRACT NO	PURCHASE ORDER DATE	PURCHASE ORDER NO	RELEASE
057042		02/17/76	89571A	

DMS RATING	RENEGO	CUSTOMER IDENTIFICATION	REPUBLIC ORDER NO DIST	NUMBER	MFG	TEX NO
			05	31543	3150	5

CERTIFICATE OF TESTS

TEAM	OFFICE DIST	OFFICE SLM	INVOICE DATE	INVOICE NUMBER
J1 A2	05	12		315-206

LE	ACCOUNT NUMBER	TERMS
C	12564001	30-1/2-10

SOLD TO
CANN & SAUL STEEL CO
ROVERSFORD, PA. 19468

SHIP TO

DATE SHIPPED	FROM	ROUTE/VEHICLE IDENTIFICATION
2/23/76	97 CTN SOU	B&F

I HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS

ITEM NO	MATERIAL DESCRIPTION	%	QUANTITY SHIPPED
	H FIN BARS ENDURO STNLS TYPE 410 FORGING Q ANN DISTRESSED MATL		
05	RDS 6-1/2 X 12 FT 10 IN 1 PC HT 8034496 #5 MKD BB	C	1420#
	SHIPT COVD BY INV 315-202 TO 07 INC		

REISSUED 12/10-76 ADDING NI & MOLY.

B.C. HUGHES
DIVISIONAL CHIEF METALLURGIST

BY _____
R.L. KEMP, CONTROL TECHNICIAN

ANALYSIS

ITEM NO	HEAT NO	GRAIN	CARBON	MANG	PHOS	SUL	SIL	COPPER	NICKEL	CHROME	MOLY	VAN	CB
5	8034496		.112	.52	.016	.005	.12		.34	11.85	.06		

TEST RESULTS

ITEM NO	HEAT NUMBER	TEST OR PIECE IDENTITY NO	YIELD PSI	TENSILE STRENGTH PSI	ELONG 2	ELONG 8	R AREA	BEND TEST	HARDNESS

DEC 15 1976

FOR INFORMATION ONLY

Wld 9

H.T. Proc. #F-6B(8/2. 5) and Addendum
10/4/76
1760 F - 4 Hrs. Quench in Oil
Atwood & Morrill Co., Inc.
AM-4835
4 - Pilot Poppet Forgings per Dwg. 24545-B, Rev. 1
for Code 15902-052-0097
Forgings serialized #1 thru 4
Heat No. 72613

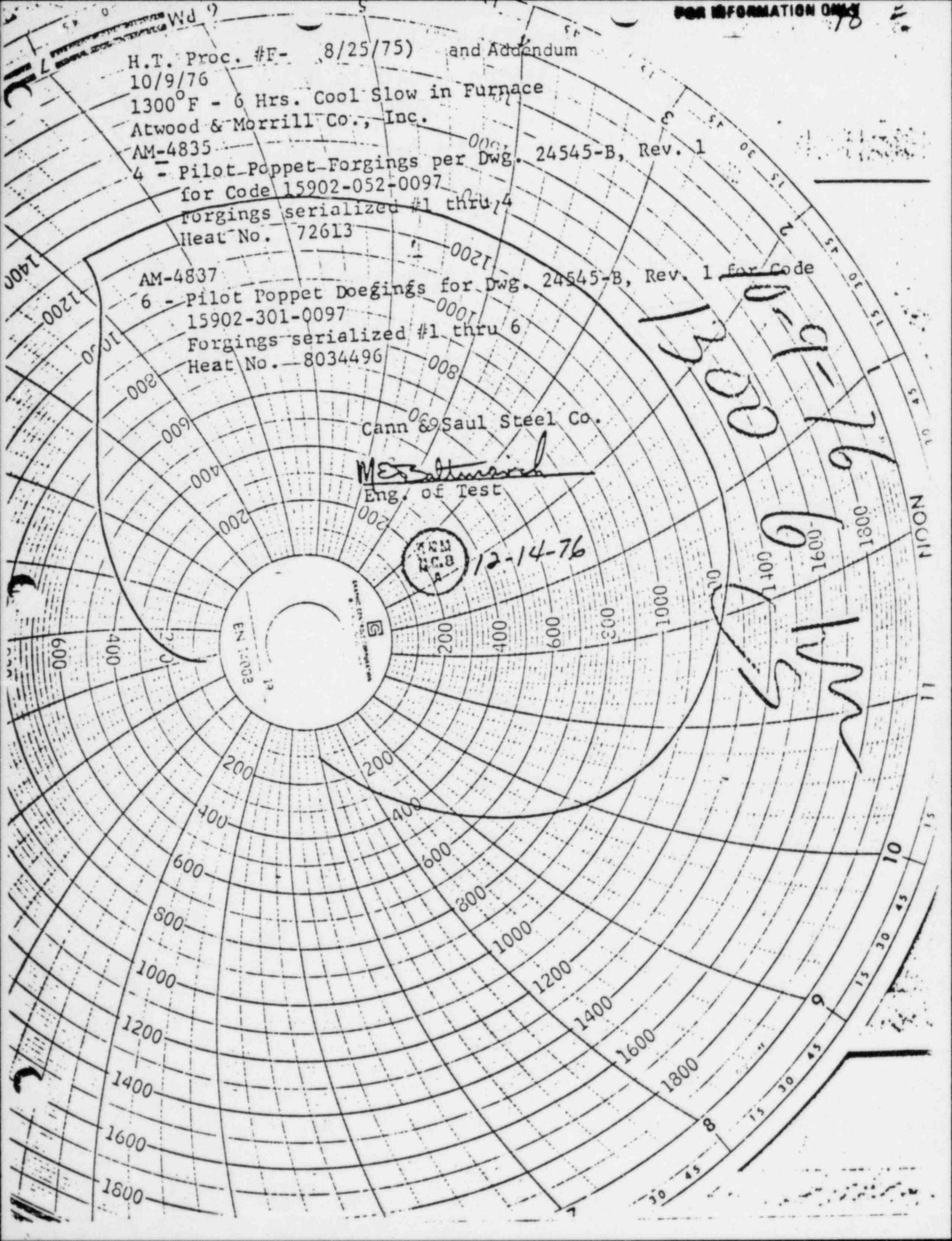
AM-4837
6 - Pilot Poppet Forgings for Dwg. 24545-B, Rev. 1 for Code
15902-301-0097
Forgings serialized #1 thru 6
Heat No. 8034496

Cann & Saul Steel Co.

M E Baltruweit
Eng. of Test

A&M R.C.B. 1

12-14-76


FOR INFORMATION ONLY
H.T. Proc. #F- 8/25/75) and Addendum
10/9/76
1300°F - 6 Hrs. Cool Slow in Furnace
Atwood & Morrill Co., Inc.
AM-4835
4 - Pilot Poppet Forgings per Dwg. 24545-B, Rev. 1
for Code 15902-052-0097
Forgings serialized #1 thru 4
Heat No. 72613
AM-4837
6 - Pilot Poppet Doegings for Dwg. 24545-B, Rev. 1 for Code
15902-301-0097
Forgings serialized #1 thru 6
Heat No. 8034496
Cann & Saul Steel Co.
Eng. of Test
12-14-76
1300 6 hrs
10-9-76
NOON

Feedwater Check Valve

W6B/37EA/jj

FOR INFORMATION ONLY

E6288-19

CUSTOMER	Anchor/Darling Valv. Co. 701 First Street Williamsport, Pa. 17701
SHIP TO	Same
CUST. CODE	050
MARK FOR P.O.	

PREPAID | COLLECT XX | VIA Truck | TERMS Net 30 days

CUSTOMER: Anchor/Darling Valve Co. - Pa.

SHIP DATE: 1/31/79 | D.F. ORDER NO.: 1-06241 2-2

QUANTITY	C.O.	PATTERN NO.	CUSTOMER ORDER NO.
4	1	2561-5-4 (18" 900# TOC Disc)	P-2425

PAT. PER	MOLDS	D/P NO.	UNIT WGT.	TOTAL WGT.	OPER.
1	4	D-7491, Rev. C	325	1300	24

ORD. ENTERED	CUSTOMER SPECIFICATION	METAL	H.T. CODE	ROUTING CODE
10/25/78	SA216-WCB, VT-MSS-SP55 No weld - Nucl.	Spec.	C10	128

SALESMAN: 04

BUYER: Louden

CUST. REQ. DEL.: 1/79

INSTRUCTIONS:
(2) 3 copies T.R. & Docu., Subm. 4 rgh TB/heat
(3) Melt & Lab use Melt Procedure MP 1.20, use 120 for gates, Charpy @40°F, 25 M.L.E., Arc air visual defects as per Dodge's no weld specification. No weld - Nucl. H.T. 2NET, H.T. chart req. PWHT 12 hrs. @1150°F

TEST BARS: 5 K.B.

CERTIFICATION OF CHEMICAL & PHYSICAL TESTS – HEAT TREATMENT – N.D.E. TESTS

HEAT NO. 4284 | SERIAL NO. SK-2461 SN-2464 | QUANTITY IN HEAT 2 | DATE POURED 12/5/79

CHEMICAL ANALYSIS – MAT. SPEC. SA216-WCB

C	MN	SI	P	S	CR	NI	MO	AL	CU		
.16	.91	.49	.022	.014	.32	.26	.15	.068	.10		

WELD METAL CHEMICAL ANALYSIS | WELDING PROCEDURE NUM. R

Filler Metal Spec.	Lot Number	C	MN	SI	CR	NI	MO			Welder's I.D.

TENSILE PROPERTIES OF CASTING

T.S. P.S.I.	Y.P. P.S.I.	Y.S. P.S.I.	EL. %	R.A. %	BHN RANGE
82,200	58,400		36%	64.0	179

TENSILE PROPERTIES OF WELDING ELECTRODE

T.S. P.S.I.	Y.P. P.S.I.	Y.S. P.S.I.	EL. %	R.A. %	BHN RANGE

IMPACT TEST

TEMP. °F	1	2	3	AVG.
(FT. LBS.)	68	79	71	73
(M.L.E.)	56	66	58	60
SHEAR %	50	70	60	60

BEND TEST

Specification

TYPE	DEG.	AGE	No.
RESULTS			

CORROSION TEST

SPEC. | TYPE | TEMP | RESULTS

Ferrite Content %
Measured by

HEAT TREATMENT

TYPE	TEMP. °F	TOT. HRS.	LOADING	CHART ATT.
HOMOGENIZE				
NORMALIZE	1650°F	3 1/2	3163	✓
NORMALIZE	1600°F	3 1/2	3165	✓
TEMPER	1250°F	3 3/4	3004	✓
WATER QUENCH				
OIL QUENCH				

H.T. Procedure 48.03, Rev. 1 is applicable

PWHT TB 1150°F 12 ✓

N.D.E. SPECIFICATIONS	SER. NO.	APP'D	DATE
VT PER MSS-SP55	2461 2464	OK	12/78
MT-LPT PER A/DV Cert Rev'd 1-16-79			
RT PER Review Date 1-16-79			

REPORTS ATTACHED

- HEAT TREATMENT CHART ✓
- RT FILM & READER & SHOOTING SKETCH
- WELD REPAIR MAP
- SNT-TC-1A CERTIFICATE
- WELDING PROCEDURE - QUALIFICATION TEST
- WELDER'S QUALIFICATION TEST

REMARKS:
Castings were manufactured in accordance with A/DV SPI PUR-2, ASME Section III 1974 Edition and Winter 1975 Addenda
23804, 23805-07
SEE ATTACHED REPORT
RAMBALL TESTLAB
4 ROUGH TESTBARS

We hereby certify that the above material has been tested in accordance with the listed specifications and conforms to all applicable requirements thereof.

Don [illegible] 1/3/79
Quality Assurance Date

DODGE FOUNDRY & MACHINE CO.
6501 STATE ROAD., PHILA., PA. 19135

SURVEILLANCE SPECIALIST 47

BECHTEL 636

1290362 11197

Ramball Testlab

6501 STATE ROAD – PHILADELPHIA, PA. 19135
(215) 332 4011

LABORATORY REPORT

Date: December 22, 1978
P.O.# M-2129

Anchor/Darling Valve Co.
701 First Street
Williamsport, PA 17701

Heat # 4310 PO# P-2425
Material: ASME-SA-216, WCB

TENSILE TEST

Lab # 23936

YIELD STRENGTH	46,300 psi
TENSILE STRENGTH	75,300 psi
ELONGATION	33 %
REDUCTION OF AREA	72 %

0.505" diameter tensile specimen, 2" gauge length.

CHARPY IMPACT TEST

LAB #	FOOT POUNDS	MILS LATERAL EXPANSION	% SHEAR
23937	112	85	60
23938	86	72	60
23939	142	81	80
Average	113	79	67

1.0 cm x 1.0 cm Charpy Specimen.

The above test specimens were heat treated similar to production castings. The test bars only were given an additional stress relief heat treatment at 1150 degrees F for 15 hours. The Charpy V-Notch Impact Test was performed at +40 degrees F.

Metallurgist

SURVEILLANCE SPECIALIST 47

1290362 1020

FOR INFORMATION ONLY

62290-19

CUSTOMER: Anchor/Darling Valve Co.
701 First Street
Williamsport, Pa. 17701

SHIP TO: Same

CUST. CODE 050

MARK FOR P.O.

PREPAID	COLLECT	VIA	TERMS
	XX	Truck	Net 30 days

CUSTOMER: Anchor/Darling Valve Co. - Pa.

SHIP DATE: 1/31/79

D.F. ORDER NO.: 1-06241 1-?

QUANTITY	C.O.	PATTERN NO.	CUSTOMER ORDER NO.
4	2	2561-5-1 (18" 900# TDC Body)	P-2425

PAT. FLR	MOLDS	D/P NO.	UNIT WGT.	TOTAL WGT.	CPLR.
1	4	F-4629	2625	10500	25

ORD. ENTERED	CUSTOMER SPECIFICATION	METAL	H.T. CODE	ROUTING CODE
10/25/78	SA216-WCB, VT-MSS-SP55 No weld - Nucl.	Spec.	C10	128

SALESMAN: 04 156

BUYER: Louden.

CUST. REQ. DEL.: 1/79

INSTRUCTIONS:
(2) 3 copies T.R. & Docu., Subm. 4 rgh TB/heat
(8) Melt & Lab use Melt Procedure MP 1.20, use 120 for gates, Charpy @40°F, 25 M.L.E., Arc air visual defects as per Dodge's no weld specification, no weld - Nucl. H.T. 2N&T, H.T. chart req. PWHT 12 hrs. @1150°F, Min. wall 1.75

TEST BARS: 5 K.3

CERTIFICATION OF CHEMICAL & PHYSICAL TESTS – HEAT TREATMENT – N.D.E. TESTS

HEAT NO. 4310 | SERIAL NO.S: SW-2473, SX-2474 | QUANTITY IN HEAT 2 | DATE POURED 12/8/78

CHEMICAL ANALYSIS – MAT. SPEC. SA216-WCB

C	MN	SI	P	S	CR	NI	MO	AL	CU		
.16	.88	.37	.020	.015	.36	.26	.15	.037	.10		

WELD METAL CHEMICAL ANALYSIS

Filler Metal Spec.	Lot Number	C	MN	SI	CR	NI	MO			Welder's I.D.

WELDING PROCEDURE NUMBER

TENSILE PROPERTIES OF CASTING

T.S. P.S.I.	Y.P. P.S.I.	Y.S. P.S.I.	EL. %	R.A. %	BHN RANGE
75,300	46,300		33%	72%	156

TENSILE PROPERTIES OF WELDING ELECTRODE

T.S. P.S.I.	Y.P. P.S.I.	Y.S. P.S.I.	EL. %	R.A. %	BHN RANGE

IMPACT TEST

TEMP. 40°F	1	2	3	AVG.
(FT. LBS.)	112	86	142	113
(M.L.E.)	85	72	81	79
SHEAR %	60	60	80	67

BEND TEST

Specification

TYPE	DEG.	AGE	No.

RESULTS

CORROSION TEST

Ferrite Content %

SPEC. | TYPE | Measured By

TEMP. | RESULTS

HEAT TREATMENT

TYP	TEMP. °F	HRS.	MIN.	CHART NO.
HOMOGENIZE				
NORMALIZE	1650°F	4	1/2	3189 ✓
NORMALIZE	1600°F	4	1/2	3191 ✓
TEMPER	1250°F	4	3/4	3022 ✓
WATER QUENCH				
OIL QUENCH				

H.T. Procedure 48.03, Rev. 1 is applicable

PWHT TB 1150°F 12 ✓

REPORTS ATTACHED

- HEAT TREATMENT CHART ✓
- RT FILM & READER & SHOOTING SKETCH
- WELD REPAIR MAP
- SNT-TC-1A CERTIFICATE
- WELDING PROCEDURE - QUALIFICATION TEST
- WELDER'S QUALIFICATION TEST

N.D.E. SPECIFICATIONS	SER. No.	APPD	DATE
VT PER MSS-SP55	2473, 2474	OK	12/78
MT-LPT PER			
RT PER			

ANCHOR/DARLING VALVE CO.
L. B. SNYDER
Q.A. 81 DATE: 2-12-79

REMARKS:
Castings were manufactured in accordance with A/DV SPI TUR-2, ASME Section III, 1974 Edition and Winter 1975 Addenda
23732 23737-39
SEE ATTACHED REPORT / RAMBALL TESTLAB / 4 ROUGH TESTBARS

We hereby certify that the above material has been tested in accordance with the listed specifications and conforms to all applicable requirements thereof.

Quality Assurance — Date 1/9/79

DODGE FOUNDRY & MACHINE CO.
6501 STATE ROAD, PHILA., PA. 19135

SURVEILLANCE SPECIALIST 47

1290362 10019

FOR INFORMATION ONLY

Form T-14

CANN & SAUL STEEL CO.

ROYERSFORD, PA. 19468

Report of Physical Tests and/or Chemical Compositions

Date 2/14/78

Customer's Order No. N-1942

Cann & Saul Order No. 45667

Customer ANCHOR/DARLING VALVE COMPANY S.O.#E-6288-19

Address 701 FIRST STREET WILLIAMSPORT, PA. 17701

Attention PURCHASING DEPT.

RECEIVED
FEB 17 1978
PURCHASING DEPT.

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CU
216394	.28	.77	.012	.021	.23				

Lab. No.

PHYSICAL TESTS

CUT FROM	TEST NUMBER	GAUGE	YIELD PT. LBS.	YIELD PER Square In Lbs.	STROKE AT LBS.	ULTIMATE TENSILE LBS.	ELONG %	REDUCED AREA	Reduction %	B.H.N.
			YS	YS .2%						
Forging	45667 1	.505	12,100	60,500	20,000	100,000	25.0	.079	60.5	
Charpy Impacts "V" Notch			28 31 29 Mils Lat. Exp. @ +40°F 28 30 28 Ft. Lbs. 10 10 10 percent shear							

OTHER TESTS

A/DV Cert 49
Review Date 2/20/78

BRINELL 170/174
Heat Treat. Proc. 1007(Rev. 1)(11/9/77)
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 materials specification and the ASME Code Section III '74 Ed. thru '75

Customer's Specifications: ASME SA105

Charpy "V" Impact 25 Mils Lat. Exp. @ +40°F

26/35 CARBON B.H.N. 187 MAX.

XXX 36,000 YS 2% Winter Add
T. 70,000
E. 22%
R. 30%

THE ABOVE TESTS COVER THE FOLLOWING MATERIAL:

4 - 18" 900 TDC BONNET FORGINGS FOR DRAWING D-7492
Forgings serialized #1 thru 4

A/DV
Inspection

Inspector

CANN & SAUL STEEL CO.

End of Tests

SURVEILLANCE SPECIALIST 47

BECHTEL 636

9 0 3 6 1 9 1

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

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

1. Manufactured by Anchor/Darling Valve Co., 701 First St., Williamsport, PA 17701
   (Name and Address of Manufacturer)
2. Manufactured for Houston Lighting & Power Co., Electric Tower P.O. Box 1700, Houston, TX 77001
   (Name and Address of Purchaser or Owner)
3. Location of Installation Houston Lighting & Power Co., Matagorda County, Wadsworth, TX
   (Name and Address)
4. Pump or Valve Valve . Nominal Inlet Size 18" (inch) Outlet Size 18"

	(a) Model No., Series No. or Type	(b) Manufacturers' Serial No.	(c) Canadian Registration No.	(d) Drawing No.	(e) Class	(f) Nat'l. Bd. No.	(g) Year Built
(1)	Tilt Disc Ck.	E-6288-19-5	N/A	93-14831 R/E	2	N/A	1979
(3)							
(4)							
(5)							
(6)							
(7)							
(8)							
(9)							
(10)							

5. 18" 900# PRESSURE SEAL TILT DISC CHECK
   (Brief description of service for which equipment was designed)

6. Design Conditions 1285 (Pressure) psi 600 (Temperature) °F or Valve Pressure Class 900 (1)
7. Cold Working Pressure 2160 psi at 100°F.
8. Pressure Retaining Pieces

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
BODY HT.# 4310 S/N R6226	SA216-WCB	DODGE FOUNDRY AND MACHINE CO.	
DISC HT.# 4284 S/N R5951	SA216-WCB	DODGE FOUNDRY AND MACHINE CO.	
(b) Forgings			
BONNET HT.# 216394 S/N 3	SA105	CANN & SAUL STEEL CO.	
HINGE PIN COVER HT.# 81673	SA105	CANN & SAUL STEEL CO.	

(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.

(1/78) This form (E00037) may be obtained from the Order Dept., ASME, 345 E. 47 St., New York, N.Y. 10017

BECHTEL 536

SURVEILLANCE SPECIALIST 47

1-29-80 7-6-1-0-7-9

FORM NPV-1 (Back)

Mark No.	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
COVER STUDS HT.# 396344	SA193-B7	R.E.C. CORPORATION	
COVER NUTS HT.# 6020568	SA194-2H	NUTS, INCORPORATED	
(d) Other Parts			
GASK. RET. RING HT.# 690129	SA106	TUBULAR STEEL INCORPORATED	

9. Hydrostatic test 3250 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. 1567, 1677 & 1744 Date 10-12-79

Signed Anchor/Darling Valve Co. (Manufacturer) by H. Yoon H. Yoon

Our ASME Certificate of Authorization No. N1712 to use the N (N) (NPV) symbol expires 4/15/80 (Date)

CERTIFICATION OF DESIGN

Design information on file at Anchor/Darling Valve Co. 701 First St., Williamsport, PA

Stress analysis report (Class 1 only) on file at N/A

Design specifications certified by (1) James L. Hawks

PE State Texas Reg. No. 37441

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~~ Pennsylvania and employed by Commercial Union Ins. Co. of Boston, Mass. have inspected the ~~pump or~~ valve, described in this Data Report on 2-22-78 thru 10-13 19 79 and state that to the best of my knowledge and belief, the Manufacturer 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 10-13-79

Russell E. Montgomery (Inspector)

Commissions Pennsylvania WC972 (Nat'l Bd., State, Prov. and No.)

BECHTEL 636

Feedwater Isolation Valve

W6B/37EA/jj

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

S/O 10788

1. Manufactured by W-K-M Div.,ACF Ind.Inc., 16500 S. Main, Missouri City, Texas
(Name and Address of N Certificate Holder)
2. Manufactured for Houston Lighting & Power, P.O. Box 308, Bay City, Texas 77414
(Name and Address of Purchaser or Owner)
3. Location of Installation South Texas Project, HL&P Co., Matagorda County, FM 521
(Name and Address)
4. Pump or Valve Valve. Nominal Inlet Size 18 (inch) Outlet Size 18 (inch)

	(a) Model No., Series No. or Type	(b) N Certificate Holder's Serial No.	(c) Canadian Registration No.	(d) Drawing No.	(e) Class	(f) Nat'l. Bd. No.	(g) Year Built
(1)	Gate Valve	536740	N/A	RS259313	2	1996	1983
(2)							
(3)							
(4)							
(5)							
(6)							
(7)							
(8)							
(9)							
(10)							

5. Feedwater Isolation
(Brief description of service for which equipment was designed)
Tag: 1-S13-FV-7143

6. Design Conditions 1285 (Pressure) psi 600 (Temperature) °F or Valve Pressure Class 900 (1)
7. Cold Working Pressure 2250 psi at 100°F.
8. Pressure Retaining Pieces

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
Body Cntr Sec.	SA216, WCC	PRL Ind.	Heat 1648(K1141)
(b) Forgings			
Bdy Upr Sec	SA-350, LF2	Energy Prod.	Heat 217990-5
Bdy Lwr Sec	SA-350, LF2	Energy Prod.	Heat 217089-4
Bonnet	SA-350, LF2	Coulter Steel	Heat 722248-7

(1) For manually operated valves only.

BECHTEL 489

* 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.

Mark No.	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
Studs	SA-193, B7	R.E.C. Corp.	Heat 54615
Nuts	SA-194, 2H	R.E.C. Corp.	Heat Y731961
(d) Other Parts			
Gate	SA-487, CA6NM	PRL Ind. Inc.	Heat 2640 (K1108)
Segment	SA-487, CA6NM	PRL Ind.Inc.	Heat 568 (K1105)

9. Hydrostatic test 3375 psi. Disk Differential test pressure 2200 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. I., Edition 1974, Addenda Winter '75 (Date), Code Case No. 1781. Date February 27, 1984

Signed W-K-M Div. ACF Ind.Inc. (N Certificate Holder) by John B Hasty

Our ASME Certificate of Authorization No. N-1942 to use the N (N) symbol expires 11-18-83 (Date).

(Expiration date extended to 5-18-84)

CERTIFICATION OF DESIGN

Design information on file at W-K-M Division, ACF Ind.Inc.

Stress analysis report (Class 1 only) on file at N/A

Design specifications certified by (1) James L. Hawks

PE State Texas Reg. No. 37441

Stress analysis certified by (1) N/A

PE State N/A Reg. No. N/A

(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 Texas and employed by H.S.B. I&I Co. of Connecticut have inspected the pump, or valve, described in this Data Report on 3-19 1984, 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 3-19 1984.

D. E. Truman (Inspector) Commissions NB 4893 (Nat'l Bd., State, Prov. and No.)

RECEIVED
489

CHEMICAL ANALYSIS & MECHANICAL TEST REPORT

DATE: 10/2[illegible] 8

METCAST
401 Worthington Ave. Harrison, New Jersey 07029
(201) 482-5700

Metcast Order MII 501745

Customer Order 5521

Pattern No. 264811 Rev. N390

Name of Part 16" Gate

TO: PRL Industries
Cornwall, PA 17016

MATERIAL SPECIFICATIONS

METCAST: 3277
MIL
FEDERAL:
ASTM - A
ASME SA 487-75-GR CA 6 NM
COML.:

CHEMICAL ANALYSIS

LINE	QTY.	PATTERN No.	HEAT No.	SER. No.	C	S	P	SI	MN	CR	NI	MO	CU	CB	V	W	SB	FE	
1	1	REV. N390 264811	2640		.04	.013	.029	.60	.52	12.60	3.93	.57			.015				
2																			
3																			
4																			
5																			

CANCELLED
2-32-79
ACM

TEST BARS-- NORM. 1900°F 2HRS. AC TEM. 1125°F 2HRS. AC
TEM. 1250°F 2HRS. AC

MECHANICAL TEST

LINE	Yield PSI	Tensile PSI	% Elong.	% Red. of Area	Hardness BHN	Weld Test	Weld Bend Test	Macro. Etch
1	87,000	112,500	22	36				
2								
3								
4								
5								

11/13/78
Q A P 2
MAL

REMARKS

CHARPY V NOTCH IMPACT TEST - TEST TEMP. + 40°F

	IMPACT VALUE	LATERAL EXPANSION	% SHEAR
1.	66 FT. LBS.	47 MILS	40%
2.	64 FT. LBS.	46 MILS	40%
3.	67 FT. LBS.	44 MILS	40%

K1108

BECHTEL
711

RIP #20612

P4.7

We certify this is a true copy of the original test report now on file.

J. Breslin

CHEMICAL ANALYSIS & MECHANICAL TEST REPORT

DATE: 11/13/78

METCAST
401 Worthington Ave. Harrison, New Jersey 07029
(201) 482-5700

MATERIAL SPECIFICATIONS

METCAST: 3277
MIL
FEDERAL:
ASTM – A
ASME SA 487 75 CA 6 NM
COML.:

Metcast Order MH 501744
Customer Order 5520
Pattern No. 264809 Rev. N390
Name of Part 16" Segment

TO: PRL Industries, Inc.
P.O.Box 142
Cornwall, PA 17016

CHEMICAL ANALYSIS

QTY.	PATTERN No.	HEAT No.	SER. No.	C	S	P	SI	MN	CR	NI	MO	CU	CB	V	W	SB	FE		
5	Rev. N390 264809	568	S 4 S 8	.06	.020	.028	.46	.49	12.30	3.91	.60			.010					

CHECKED OK

BY GM

TEST BARS-- NORM. 1925°F, TEM. 1250°F, TEM. 1125°F

MECHANICAL TEST

Yield PSI	Tensile PSI	% Elong.	% Red. of Area	Hardness BHN	Weld Test	Weld Bend Test	Macro. Etch		REMARKS
82,000	110,500	22	56	241					CHARPY V NOTCH TEST - TEST TEMP.+ 40°F
						11/3/78		K1102	
						QA P 2		K1103	IMPACT VALUE / LATERAL EXPANSION / % SHEAR
						MAL		K1104	1. 71 Ft. Lbs. 54 Mils 50 %
								K1105	2. 70 Ft. Lbs. 50 Mils 50 %
								K1106	3. 75 Ft. Lbs. 57 Mils 50 %

BECHTEL 592

segment

certify this is a true copy of the original test report now on file.

J. Brelus
Metallurgist

Forged Products Division

6505 N. HOUSTON-ROSSLYN ROAD
HOUSTON, TEXAS 77091
GULF-WESTERN MANUFACTURING COMPANY

ENERGY PRODUCTS GROUP

FOR INFORMATION ONLY See TDI-

CERTIFIED TEST REPORT

NUCLEAR P4.7

SOLD TO
VKG VALVE
P.O. BOX 2117
HOUSTON, TEXAS 77007

SHIPPED TO
SAME
MISSOURI CITY, TEXAS

BODY: LOWER SECTION

DATE SHIPPED	CUSTOMER'S ORDER NO	SHIPPED VIA
11/20/78	95206	COLLECT ☐ PREPAID ☐

QTY	JOB #	PC #	HEAT CODE	DESCRIPTION	P/C
2	29423	1-2	217089	ROUGH MACHINED TO FINISH HEMI-HEAD PER F.P. DWG. J/O 29423 MATERIAL: A350 LF2 NORMALIZED, QUENCHED & TEMPERED PART NO.: 265658 S/O 10788 & 10790 MATERIAL MANUFACTURED IN ACCORDANCE WITH ASME SECT. II & III 1974 EDITION THRU AND INCLUDING 1975 SUMMER ADDENDA, CLASS 2 MATERIAL TO COMPLY WITH NA-3700 CHEM. & MECHANICAL TESTING PER SPECIFICATION SA350 LF-2 WITH IMPACT REQUIREMENTS PER NC-2300 & 2331 @-40°F WITH 25 MILS LATERAL EXPANSION MINIMUM. N.R.C. REGULATION 10 CFR PART 21 APPLIES TO THIS ORDER. RIP#2912	1

CHECKED
OK
BY 11-30-78
6

CHEMICAL ANALYSIS

HEAT NO	MILL SOURCE	C	MN	PHOS	SUL	SIL	NI	CR	CU	MO				
217089	SHARON	.29	1.02	.013	.015	.21								
CHEM. ANAL.		.30	1.02	.009	.016	.19								

PHYSICAL PROPERTIES

YIELD STRENGTH (PSI)	TENSILE STRENGTH (PSI)	% ELONG	RED OF AREA %	HARDNESS	TYPE CHARPY	TEMP °F	ABSRB ENERGY FT/LBS	LATERAL EXP. (MILS)	% SHEAR
56,000	81,500	31.8	68.8	156-179	V-NOTCH	+40	136.0-108.0-156.0	.066	80
								.071	70
								.090	100

MISCELLANEOUS TESTING

TYPE OF TEST		G/S
	BECHTEL	
	489	

SWORN AND SWORN TO BEFORE ME

29th DAY OF NOVEMBER 19 78

Monna Hendon
NOTARY PUBLIC MONNA M. HENDON
Notary Public in Harris County, Texas
My Commission Expires June 1, 1980

I CERTIFY THAT THIS IS A TRUE COPY OF ORIGINAL TEST SHEET NOW ON FILE AT THE OFFICE OF FORGED PRODUCTS, INC., AND THAT THIS STEEL WAS MANUFACTURED AND FORGED IN THE UNITED STATES OF AMERICA

BY [signature]
QUALITY ASSURANCE

48913

COULTER STEEL & FORGE COMPAN

Special Metals in Bars and Forgings

MAILING ADDRESS P.O. BOX 8008
1414 - 67TH STREET EMERYVILLE CALIFORNIA 94662
415 - 653-2512 TELEX 33-6406 TWX 910-366-7293

1228 RIO VISTA AVENUE
LOS ANGELES CALIF 90023
TELEX 67-7340
PHONE 213-261-6115

334 WEST 8TH SOUTH
SALT LAKE CITY UTAH 84101
TELEX 38-8330
PHONE 801-322-3533

2715 6TH AVENUE SOUTH
SEATTLE WASH 98134
WESTERN UNION FAX
PHONE 206-622-6086

BONNET

METALLURGICAL REPORT

Item No.	Heat No. or Ident.	C	Mn	P	S	Si	Cr	Ni	Mo	Cb/Ta
	722248	.21	1.18	.015	.016	.23	.15	.10	.05	V .029

ASME QUALITY SYSTEM CERTIFICATE (MATERIALS)
NUMBER N-1189
EXPIRATION DATE OF CERTIFICATE 8-4-78

Item No.	Hardness of Material Supplied	Tensile	Yield — % Offset	El.	R.A.	BHN.	Size of Raw Stock	Mfr
		72,900	YP 53,900	36	76.0	156	13-1/2" RCS	ARMCO

Charpy V-Notch +40°F: Avg. Freq/Avg. Sev .051 / .032

ft-lbs	lat. exp.	%shear
83	.071	61
106	.074	65
52.5	.044	38

HT: Norm 1750°F + 25°F 2 hours A.C.
1st Aust. 1750°F + 25°F 5 hours W.Q.
2nd Aust 1575°F + 25°F 5 hours W.Q.
1st Temper 1250°F + 25°F 12 hours W.Q.
2nd Temper 1250°F + 25°F 12 hours W.Q.

P4-7

A C F INDUSTRIES, INCORPORATED
W-K-M Valve Division
P.O. Box 2117
Houston, Texas 77001

CUSTOMER ACCT NO 418244
INV REQD 2
SPEC CLAUS
TAXABLE
NON-TAXABLE X
CALL
OUR TRUCK X
PREPAY
COLLECT
VIA T
DATE SHIPPED
PARTIAL
COMPLETE

CUSTOMER'S ORDER NO 95130
ORDER DATE 24JAN78

SAME
Missouri City Plant
Houston, Texas 77459

ITEM NO	QUANTITY ORD	QUANTITY SHIP	DESCRIPTION
	8		PCS: DWG C264021 with 20-3/16"OD

Forged CARBON STEEL, Liquid Quenched & Tempered; in accord withSA-350, Grade LP2,except CVN Impact Tests 25 Mils Lateral Expansion at PLUS 40°F in lieu of MINUS 50. ASME Boiler & Pressure Vessel Code Sections II & III, Class 2, 1974 with Addenda thru Winter 1975 applies.

AS FORGED: +3/4",-0 & HUB MACHINED TO DWG

CHECKED OK 5-1-78 DV

RI P# 2912

BECHTEL 480

We certify that the contents of this report are correct and accurate, and that all operations performed by us and our subcontractors are in compliance with the requirements of all specifications listed in the material description.

We certify that the material described herein has been inspected and/or tested for conformance to the applicable specifications. Our warranty of quality provides for replacement only of any part of this material which subsequent inspection, test or use shows non-conformance with the specification. Inspection records, certifications, chemical and/or physical test reports are on file for your examination at EMERYVILLE, CALIFORNIA.

COULTER STEEL & FORGE COMPANY

By Frank Kucera
MGR. QUALITY CONTROL

MARKING AND PACKAGING REQUIREMENTS

CSF STD PLUS SA 350,Gr. LF1 +40

METALLURGICAL REPORT REQUIREMENTS

NOTARIZE	W/SHIPMENT	W/B LADING
	2	1

MAIL 2 COPIES TO

V. Kucera

P4-7

FOR INFORMATION ONLY

Forged Products Division

6505 N. HOUSTON-ROSSLYN ROAD
HOUSTON, TEXAS 77091
GULF-WESTERN MANUFACTURING COMPANY

ENERGY PRODUCTS GROUP

CERTIFIED TEST REPORT

P4.7

SOLD TO
WKM VALVE DIVISION
P.O. BOX 2117
HOUSTON, TEXAS 77001

SHIPPED TO
SAME
MISSOURI CITY, TEXAS

BODY UPPER SECTION

DATE SHIPPED	CUSTOMER'S ORDER NO	SHIPPED VIA	
7/10/78	95204		COLLECT ☐ PREPAID ☐

QTY.	JOB #	PC #	HEAT CODE	DESCRIPTION	P/C
8	29417	1-8	217990	ROUGH MACHINED TO FINISH: 31"OD X 19"ID X 18"LG MATERIAL: A350 LF2 ASME SEC. III CL. 2 PART NO.: 289656 S/O 10788/10790 ITEM 1 MATERIAL MANUFACTURED PER ASME SECT. III CLASS 2, 1974 EDITION THRU AND INCLUDING ADDENDA THROUGH WINTER 1975. MATERIAL IS IN COMPLIANCE WITH NA 3700, NC-2300 & 2311, NC 2130 & 2150 OF THE ASME NUCLEAR CODE. NRC REGULATION 10CFR PART 21 APPLIES. MATERIAL IS IN NORMALIZED AND TEMPERED CONDITIONS.	1

W-K-M
DIV. OF ACF IND., INC.

RIP#2912

NUCLEAR

NOTE:
THE USE OF ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR REPRESENTATIONS ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

CHECKED OK 7-24-78 BY

CHEMICAL ANALYSIS

	HEAT NO.	MILL SOURCE	C	MN	PHOS	SUL	SIL	NI	CR	MO			
1	217990	SHARON	.27	1.17	.009	.022	.27						
2	CHECK ANALYSIS		.29	1.30	.011	.028	.30						
3													

PHYSICAL PROPERTIES

	YIELD STRENGTH (PSI)	TENSILE STRENGTH (PSI)	% ELONG.	RED OF AREA %	HARDNESS	TYPE CHARPY	TEMP °F	ABSRB. ENERGY FT/LBS	LATERAL EXP. (MILS)	
1	51,400	82,000	32.7	59.6	143-149	V-NOTCH	+40°	58.0-60.0-56.0	34.0 38.0 33.0	
2										
3										

MISCELLANEOUS TESTING

	TYPE OF TEST	G/S
1		
2		

SUBSCRIBED AND SWORN TO BEFORE ME
THIS 12 DAY OF July 19 78

Monna M. Hendon
NOTARY PUBLIC

MONNA M. HENDON
Notary Public in Harris County, Texas
My Commission Expires June 19, 1980

I CERTIFY THAT THIS IS A TRUE COPY OF ORIGINAL TEST SHEET NOW ON FILE AT THE OFFICE OF FORGED PRODUCTS INC. AND THAT THIS MATERIAL WAS MANUFACTURED AND FORGED IN THE UNITED STATES OF AMERICA.

BECHTEL
489

BY Edward F. Oak
QUALITY ASSURANCE

FOR INFORMATION ONLY

P4.7

LINDBERG/COOK HEAT TREATING COMPANY

Division of LINDBERG CORPORATION

P. O. BOX 24147 • HOUSTON, TEXAS 77029 • 713/672-6601

CERTIFICATION OF HEAT TREATMENT

FORGED PRODUCTS LINDBERG

DATE: 5/12/73

CERTIFICATION NO. 46583

CUSTOMER'S ORDER NO. 29417

OTHER ORDER NOS.: (NONE)

NUMBER OF PARTS: NINE (9(

PART NUMBERS: (8) RGH FORG 32 5/3" CD X 16 1/4"ID X 19 1/2"LG

(1) TEST BAR 8x8x12

SPEC NO.

MATERIAL: SA350 LF2

HT# 217990

RIP#2912

WE HEREBY CERTIFY THAT THE PARTS DESCRIBED WERE GIVEN THE FOLLOWING HEAT TREATMENT

			TIME AT HEAT	COOLANT
ANNEALED		°F		
NORMALIZED	1675	°F	8HRS	AIR
QUENCHED		°F		
DRAWN	1175	°F	10HRS	AIR
NITRIDED		°F		
STRESS RELIEVED		°F		
HARDNESS TEST	143-149HN	% OF PCS. TESTED	50%	

We further certify that heat treatment described above is true and correct and that temperatures and test results were obtained with standard approved methods.

Subscribed and sworn to before me this 24TH day of MAY, 19 78

Notary Public in and for the County of Harris, State of Texas

My Commission Expires 8/31/78

LINDBERG COOK HEAT TREATING COMPANY

STEVE COOK

ASST. PLANT SUPERINTENDENT

BECHTEL
592

P4.7

Cornwall, Pa. 17016 — K1141

CUST. CODE 490 — MARK FOR P.O. MAL

PREPAID — COLLECT XX — VIA Truck — TERMS Net 30 days

CUSTOMER: PSL Industries, Inc. — SHIP DATE See Below — P.O. ORDER NO. 8-05701

QTY 8 — S.O. 3 — PATTERN NO. 264308 (18" x 16" 900# Body) — CUSTOMER ORDER NO. 5519

FURN. HEAT 1 — MOLD A — O/P NO. E-263187 Rev. N492 (WKM) — UNIT WGT. 3500# — TOTAL WGT. 28000 — CORE 28

ORD. ENTERED 5/26/78 — CUSTOMER SPECIFICATION ASME SA216 WCC — METAL Spec. — H.T. CODE C10 — ROUTING CODE 128

SALESMAN 04 — TEST BARS 5 K.B.

BUYER Zimmerman — CUST. REQ. DEL.

INSTRUCTIONS
(2) H.T. charts - Charpy 25 MLE @ -40°F, 4 TB/ht.
(8) Melt & Lab use MP 120, no weld, NI integ. spec.
H.T. charts req. Submit 4 rgh tb/heat
MSS-SP55
Submit sample

Upon approval of sample will advise delivery

RIP#2912

CERTIFICATION OF CHEMICAL & PHYSICAL TESTS–HEAT TREATMENT–N.D.E. TESTS

HEAT 1648 — SERIAL NO'S. TN-1811 — QUANTITY IN HEAT 1 — DATE POURED 9/22/78

CHEMICAL ANALYSIS–MAT. SPEC

C	MN	SI	P	S	CR	NI	MO
.16	.85	.38	.020	.015	.28	.29	.16

WELD METAL CHEMICAL ANALYSIS — WELDING PROCEDURE NUMBER

Filler Metal Spec.	Lot Number	C	MN	SI	CR	NI	MO	Welders I.D.
								C.R. Feb-14

TENSILE PROPERTIES OF CASTING

T.S. P.S.I.	Y.P. P.S.I.	Y.S. P.S.I.	EL. %	R.A. %	BHN RANGE
70,700	50,500		34%	64%	156

Ferrite Content % — Measured By

TENSILE PROPERTIES OF WELDING ELECTRODE

T.S. P.S.I.	Y.P. P.S.I.	Y.S. P.S.I.	EL. %	R.A. %	BHN RANGE

IMPACT TEST

TEMP. -40 °F	1	2	3	AVG.
(FT.-LBS.)	79	64	64	69
(M.L.E.)	65	60	64	63
SHEAR-%	80	70	70	73

BEND TEST

Specification		
Degrees	Type	
Age	Number	
Results		

CORROSION TEST

TYPE	RESULTS

HEAT TREATMENT

TYPE	TEMP. °F	TOT. HRS.	LOAD NO	CHART ATT.
HOMOGENIZED				
NORMALIZE	1650°F	6 1/2	2881	✓
NORMALIZE	1600°F	6 3/4	2883	✓
TEMPER	1280°F	6 1/4	2824	✓
WATER QUENCH				
OIL QUENCH				
STRESS RELIEVE				
ANNEAL				

REMARKS 21956 2195739

NON-DESTRUCTIVE TESTS AND RELEASE REPORT

N.D.E. SPECIFICATIONS	SER. NO.	APP'D.	DATE
VT PER MSS-SP55	1811	OK	8/78
MT–L. PER			
RT PER		BECHTEL 592	
UT PER			

REPORTS ATTACHED	✓
VT-V.I.R.	
DIMENSIONAL LAYOUT	
DIMENSIONAL CONFORMANCE CERT.	
MT–LPT WELD REPAIR MAP	
SNT-TC-1A CERTIFICATES	
RT WELD REPAIR MAP	
WELDING PROCEDURE	
WELDERS INITIAL QUALIFICATION TEST	