GULF STATES UTILITIES COMPANY
POST OFFICE BOX 2951 · BEAUMONT, TEXAS 77704
AREA CODE 409 838-6631

December 21, 1983
RBG-16,622
File No. G9.5, G9.8.6.1

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commisson
Washington, D. C. 20555

Dear Mr. Denton:

River Bend Station Units 1 & 2
Docket Nos. 50-458/50-459

Enclosed for your review is Gulf States Utilities Company's (GSU) completed response to NRC letters dated August 5 and December 17, 1981 concerning fracture prevention of the containment pressure boundary (GDC-51). This response supplements our submittal of February 19, 1982. The most limiting materials of the containment pressure boundary and their lowest permissable service metal temperature (LPSMT) were identified as discussed in Attachment 1. A comparison was then performed against the lowest service metal temperature condition for which the materials are called upon to provide a pressure boundary under operating, maintenance, testing and postulated accident conditions. This comparison verified that the materials have sufficient fracture toughness and are in compliance with GDC-51 (Attachment 1).

Supplemental information requested in your December 17, 1981 letter, that was not provided in our letter of February 19, 1982, is provided in Attachment 2. This supplemental information includes CMTR's for each material identified in Attachment 1.

Sincerely,

J E Booker

J. E. Booker
Manager-Engineering
Nuclear Fuels & Licensing
River Bend Nuclear Group

8401050271 831221
PDR ADOCK 05000458
A PDR

erg
JEB/ERG/RJK/kt

B001
1/0

ATTACHMENT 1

Gulf States Utilities Company (GSU) has evaluated the River Bend Station - Unit 1 containment pressure boundary materials under all expected operating, maintenance, testing and postulated accident conditions and has determined that they will not undergo brittle fracture, and the probability of rapidly propogating fracture is minimized in accordance with the requirements of 10CFR50, Appendix A, General Design Criteria (GDC) 51.

GSU began the review by identifying the limiting components of each type of ferritic material which comprise the containment pressure boundary. This evaluation included the freestanding containment vessel, equipment hatches, personnel airlocks, process piping and valves, containment penetrations, their sleeves, end closure caps and flued heads. These limiting components are identified and discussed later in this attachment.

Certified Mill Test Reports (CMTR's) were then utilized in accordance with the Summer 1977 Addenda ASME Code Section III, Division 1, Subsection NC and/or NUREG-0577 to determined the Lowest Permissible Service Metal Temperature (LPSMT).

The Lowest Service Metal Temperatures (LSMT's) were identified for these components for all expected normal operation, testing, maintenance and postulated accident conditions. The LSMT's identified in Table 1 were based on either containment ambient temperatures or circulating fluid temperatures.

The LSMT's were then compared with the LPSMT's to verify acceptability of the limiting containment pressure boundary components. As can be seen in Table 1, all LSMT's were readily acceptable with exception of the main feedwater isolation valve disc. However, the identified LSMT of less than 80 F (the LPSMT) occurs only in an isolated case where the required thickness of the component is only 2.166 in. The adjusted LPSMT for this thickness is 65 F, below the LSMT of 70 F for this case.

ATTACHMENT 1 (Cont'd)

LIMITING CONTAINMENT PRESSURE BOUNDARY MATERIALS

The identified limiting materials of the containment pressure vessel boundary within the context of GDC 51 criteria were:

1. Equipment Hatch and Personnel Airlocks

   a. SA-516, Grade 70, normalized material applied for the equipment hatch bolt flange with a thickness of 6 in. is identified as a limiting material. Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign a Tndt of 0 F and a lowest permissible service metal temperature (LPSMT) of +62.5 F, allowing adjustment for thickness. It should be noted that the purchased material thickness of 6 1/2 in. indicated on the CMTR was machined to 6 in. during the fabrication process.

   b. SA-516, Grade 70, quenched and tempered material applied for the personnel airlock collar with a thickness of 5 in. is identified as a limiting material. Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign a Tndt of -10 F and an LPSMT of +45 F, allowing adjustment for thickness.

2. Sleeves

   a. SA-516, Grade 70, normalized material applied for main steam penetration sleeves with a wall thickness of 1.5 in. is identified as a limiting material. Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign a Tndt of 0 F and an LPSMT of +30 F, allowing adjustment for thickness.

   b. SA-333, Grade 6, normalized material applied for steam supply penetration sleeves with a wall thickness of 1.218 in. CMTR indicates that the material was charpy V-notch tested at -50 F to criteria that would infer a Tndt of -28 F or lower, given the material's chemistry (1.23/1.26 percent Mn). Assuming a Tndt of -28 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +2 F, allowing adjustment for thickness.

ATTACHMENT 1 (Cont'd)

c. SA-508, Class 1, quenched and tempered material applied for steam supply penetration sleeve adapters with a wall thickness of 2.5 in. is identified as a limiting material. Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign a Tndt of +10 F and an LPSMT of +40 F, allowing adjustment for thickness.

d. SA-234, Grade WPB, normalized material applied for spare penetration caps with a wall thickness of 0.843 in. is identified as a limiting material. Since SA-234, Grade WPB, is equivalent to SA-516, Grade 70, Summer 1977 Addenda for ASME Code Section III, Division 1, Subsection NC, would assign an Tndt of 0 F and a LPSMT of +30 F, allowing adjustment for thickness.

3. Process Pipes

a. SA-106, Grade B, normalized material applied for main steam process piping with a wall thickness of 1.066 in. is identified as a limiting material. NUREG-0577, Figure B.7 and Table 4.4, would assign a Tndt in the population at or below the +40 F NDT. Assuming a Tndt of +40 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +70 F, allowing adjustment for thickness.

4. Flued Heads

a. SA-105 quenched and tempered material applied for the main steam flued heads with a thickness of 4.58 in. is identified as a limiting material. NUREG-0577, Table 4.4, assigns an (NDT + 1.3σ) NDT of -5 F and an NDT of -28 F to normalized C-Mn material. Since the material is quenched and tempered, the Tndt can be assumed to be at or below -28 F. Assuming a Tndt of -28 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +27 F, allowing adjustment for thickness.

b. SA-508, Class 1, normalized, quenched, and tempered material applied for the main feedwater flued heads with a minimum design thickness of 7.043 in. is identified as a limiting material. CMTR indicates drop weight testing that would allow a Tndt of 0 F. Given a Tndt of 0 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +68 F, allowing adjustment for thickness.

ATTACHMENT 1 (Cont'd)

5. Valves

a. SA-216, Grade WCB, normalized and tempered material applied for main steam isolation valve bodies with a minimum design thickness of 2.125 in. is identified as a limiting material. NUREG-0577, Figure B.2, and Table 4.4 assigns an (NDT + 1.3σ) NDT of -57 F and an NDT of +35 F. Since the material was normalized and tempered, the Tndt can be assumed to be at or below +35 F. Assuming a Tndt of +35 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +65 F, allowing adjustment for thickness.

b. SA-105 quenched and tempered material applied for the main steam isol on valve covers with a minimum design thickness of 5.8125 in. is identified as a limiting material. NUREG-0577, Table 4.4, assigns an (NDT +1.3σ) NDT of -5 F and an NDT of -28 F to normalized C-Mn material. Since the material is quenched and tempered, the Tndt can be assumed to be at or below -28 F. Assuming a Tndt of -28 F, Summer 1977 Addenda ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +32 F, allowing adjustment for thickness.

c. SA-350, Grade LF2, quenched and tempered material applied for the main steam isolation valve poppets with a minimum design thickness of 5.875 in. is identified as a limiting material. SA-350, Grade LF2, is categorized as C-Mn material. NUREG-0577, Table 4.4, assigns an (NDT +1.3σ) NDT of -5 F and an NDT of -28 F to normalized C-Mn material. Since the material is quenched and tempered, the Tndt can be assumed to be at or below -28 F. Assuming a Tndt of -28 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +32 F, allowing adjustment for thickness.

d. SA-540, Grade B-23, Class 5, applied to bolting material on the main steam and main feedwater isolation valves is identified as a limiting material. NUREG-0577, Table 4.6, categorizes this material as having low susceptibility to brittle fracture.

ATTACHMENT 1 (Cont'd)

e. SA-216, Grade WCC, normalized material applied to main feedwater isolation valve bodies with a minimum design thickness of 2.08 in. is identified as a limiting material. NUREG-0577, Figure B.2 and Table 4.4, assigns an (NDT +1.3σ) NDT of +57 F and an NDT of +35 F. Since the material was normalized, the Tndt can be assumed to be at or below +35 F. Assuming a Tndt of +35 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +65 F, allowing adjustment for thickness.

f. SA-516, Grade 70, normalized material applied to main feedwater isolation valve covers with a minimum design thickness of 4.75 in. is identified as a limiting material. Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign a Tndt of 0 F and an LPSMT of +55 F, allowing adjustment for thickness.

g. SA-216, Grade WCC, normalized material applied for main feedwater isolation valve discs with a minimum design thickness of 3.427 in. is identified as a limiting material. NUREG-0577, Figure B.2 and Table 4.4, assigns an (NDT +1.3σ) NDT of +57 F and an NDT of +35 F. Since the material was normalized, the Tndt can be assumed to be at or below +35 F. Assuming a Tndt of +35 F, Summer 1977 Addenda of ASME Code Section III, Division 1, Subsection NC, would assign an LPSMT of +80 F, allowing adjustment for thickness.

TABLE 1

River Bend Station - Unit 1
GDC-51 Fracture Prevention of Containment Pressure Boundary

Component System	Item	Thick. (in.)	Material	Heat Treatment	Applicable Impact Test Data	NUREG-0577	Tndt (°F)	LPSMT (°F)	LSMT (°F)
Equipment Hatch	Bolt Flange	6	SA-516, Gr. 70	Normalized	NA	NA	0	+62.5	+70
Personnel Airlock	Collar	5	SA-516, Gr. 70	Quenched and tempered	NA	NA	-10	+45	+70
Sleeves	Main Steam Pen. No. *Z1A	1.5	SA-516, Gr. 70	Normalized	NA	NA	0	+30	+70
	Steam Supply Pen. No. *Z15	1.218	SA-333, Gr. 6	Normalized	Cv at-50°F	NA	-28	+2	+70
	Adapter Pen. No. *Z15	2.5	SA-508, Cl. 1	Quenched and tempered	NA	NA	+10	+40	+70
	Cap Pen. No. *Z125	0.843	SA-234, Gr. WPB	Normalized	NA	NA	0	+30	+70
Process Pipe	Main Steam Pen. No. *Z1A	1.066	SA-106, Gr. B	Normalized	NA	Fig. B.7 Table 4.4	+40	+70	+70

TABLE 1 (cont'd.)

Component System	Item	Thick. (in.)	Material	Heat Treatment	Applicable Impact Test Data	NUREG-0577	Tndt (°F)	LPSMT (°F)	LSMT (°F)
Flued Heads	Main Steam Pen. No. *Z1A	4.58	SA-105	Quenched and tempered	NA	Table 4.4	-28	+27	+70
	Main Feedwater Pen. No. *Z3B	7.043	SA-508, Cl. 1	Normalized, quenched, and tempered	DWT 0°F	NA	0	+68	+70
Valves	Body-Main Steam	2.125	SA-216, Gr. WCB	Normalized and tempered	NA	Fig. B.2 Table 4.4	+35	+65	+70
	Cover - Main Steam	5.8125	SA-105	Quenched and tempered	NA	Table 4.4	-28	+32	+70
	Poppet - Main Steam	5.875	SA-350, Gr. LF2	Quenched and tempered	NA	Table 4.4	-28	+32	+70
	Bolting Material-Main Steam and Feed-water	---	SA-540, Gr. B-23 Cl. 5	---	NA	Table 4.6	NA	NA	NA
	Body - Feed-water	2.08	SA-216, Gr. WCC	Normalized	NA	Fig. B.2 Table 4.4	+35	+65	+70

TABLE 1 (cont'd.)

Component System	Item	Thick. (in.)	Material	Heat Treatment	Applicable Impact Test Data	NUREG-0577	Tndt (°F)	LPSMT (°F)	LSMT (°F)
	Cover - Feed-water	4.75	SA-516, Gr. 70	Normalized	NA	NA	0	+55	+70
	Disc - Feed-water	3.427	SA-216, Gr. WCC	Normalized	NA	Fig. B.2 Table 4.4	+35	+80	See Note

NOTE: The lowest service metal temperature (LSMT) for the main feedwater isolation valve disc will be at or above +80°F. However, the LSMT may fall to +70°F in an isolated condition where only 2.166 in. minimum thickness is required. Based on the 2.166 in. minimum thickness for this condition, the LPSMT will be reduced to +65°F, allowing adjustment for thickness.

ATTACHMENT 2

Specific Responses to RAI dated December 17, 1981.

1. Containment Penetration List

   Response

   A containment penetration list was provided in the GSU letter dated February 19, 1982.

2. Code Data Report Forms NPP-1 for the piping subassemblies inboard of air-operated valve F028 (Main Steam System)

   Response

   There are no intervening piping subassemblies between the penetration and the first isolation valve outside containment.

3. Code Data Report Forms NPV-1 for air-operated valve F028 which should include the material certification for the body, bonnet, disc and bolting.

   Response

   The requested Code Data Report forms were provided in the GSU letter dated February 19, 1982. CMTR's are enclosed for the limiting components of 1B21*AOVF028 as Items No. 5.a through 5.d. (The enclosed CMTR item numbers correspond to their discussions in Attachment 1).

4. Code Data Report Forms NPP-1 for the piping subassemblies inboard of motor-operated valve F065 (Feedwater System).

   Response

   There are no intervening piping subassemblies between the penetration and the first isolation valve outside containment.

5. Code Data Report Forms NPV-1 for motor-operated valve F065 and air-operated swing check valve F032 which should include the material certification for the body, bonnet, disc and bolting

ATTACHMENT 2 (Cont'd)

Response

Code Data Report Forms for 1B21*MOVF065 were provided in GSU's letter dated February 19, 1982. Code Data Report Forms for 1B21*AOVF032 are enclosed with Item 5. CMTR's for the feedwater isolation valve limiting components are enclosed as Items 5.d through 5.g.

6. Fabrication drawings of the containment showing details on the reinforcement of the containment vessel including thickness dimensions and materials used

Response

The requested drawings were provided in GSU's letter dated February 19, 1982.

7. Detailed assembly drawings of a representative penetration referred to in Figure 3.8-4, Sheets 1 and 2 of the River Bend Station Final Safety Analysis Report.

Response

The requested drawings were provided in GSU's letter dated February 19, 1982. CMTR's for the limiting components associated with penetrations (e.g. sleeves, adapters, caps, pipes, and flued heads) are provided as Items 2, 3 and 4.

8. Detailed drawings of the equipment hatch and personnel air lock referenced in Figure 3.8-6 of the River Bend Station Final Safety Analysis Report showing the thickness dimensions and materials used.

Response

The requested drawings were provided in GSU's letter dated February 19, 1982. CMTR's for the limiting components of the equipment hatch and personnel air locks are provided as Item 1.

ATTACHMENT 2 (Cont'd)

CERTIFIED MATERIAL TEST REPORTS
(CMTR's)

United States Steel Corporation

USS 21.000.0772 (REV 7-78)

Metallurgical Test Report

PC 2 DWG 3328(

REQ. JOB CONTRACT NO | P. O DATE | PURCHASE ORDER NO M-85X1 10/02/79

SHIPPERS NO. 41805 2/05/80 | MILL ORDER NO 2609890 | INVOICE NO 163-21026

VEHICLE IDENTITY 150172 100

VENDOR: HOMESTEAD WORKS. HOMESTEAD, PA. 15120

SOLD TO: IRWIN STEEL COMPANY INC, IRWIN STEEL FABRICATORS DIV, P O BOX 1388 STATION C, CANTON OHIO 44708

SHIP TO: IRWIN STEEL COMPANY INC, IRWIN STEEL FABRICATORS DIV, 1545 WHIPPLE ROAD S W, CANTON OHIO

WE HEREBY CERTIFY THAT THE CHEMICAL ANALYSES AND/OR TEST RESULTS SHOWN IN THIS REPORT ARE CORRECT AS CONTAINED IN THE RECORDS OF THE COMPANY.

A.J. KOHRLER, CH. M.

DATE 02/26/80

SPEC. & INSP. ASME SA-516-1974 SECTION II GRADE 70 PRESSURE VESSEL QUALITY & AS[illegible] E SEC III 1974 EDITION NC COMPONENTS PARAS NE-2100 THRU 2700 APPL[illegible] TO PLATE PRODUCT. QUENCH & TEMPER W/TEST SPECIMENS SIRES (SEE ORD) PLATES

MILL CERTIFIED T/R - ANALYSIS MERCURY CONTAMINATION STATEMENT U[illegible]

N T/R - THE APPLICABLE PROVISIONS OF 10CFR PART 21 APPLY

W.E.C. QC INSPECTED 77

Q. A. APPROVED

7-28-82

IRWIN STEEL FABRICATORS DATE

ITEM NO.	MATERIAL DESCRIPTION: THICKNESS OR SECTION	WIDTH DIA. OR FT. WT.	LENGTH	QUANTITY	WEIGHT	HEAT NO.	TEST OR PIECE IDENTITY	YIELD PT. KSI	TENSILE STR. KSI	ELONGATION % IN 8"	ELONGATION % IN 2"	% RED OF AREA
06	5.0000	126	168	1	30016	69E761 3962	245332 NC	* 52.1	76.9		30.0	
							TC	* 49.9	75.1		31.0	

FULL SIZE LONG. V NOTCH CHARPY IMPACT TEST 10X10MM BAUE AT 0 DEG. F. 081.0-070.0-070.0 FT. LBS. % SHEAR RATE 072.0-065.0-055.0 AND LATERAL EXPANSION 65-62-58 MILS. AVERAGE IMPACT STRENGTH = 74

ABOVE TEST SPECIMENS STRESS RELIEVED AT 1150 DEG. F. MIN. 8.00 HRS., FRN COOLED TO 800 DEG F. TEST SPECIMENS CHARGED COLD. HEATING RATE 100 DEG. F. PER HOUR. COOLING RATE 100 DEG. F. PER HOUR. PLTS CHG COLD AUST @1670 DEG F MTD 165.0 MINS WATER QUENCH COLD TEMPER @1148 DEG MTD 300.0 MINS

"ASME QUALITY SYSTEM CERTIFICATE (MATERIALS) N-1285 JANUARY 5, 1982."

VMD SC 29012 N MK#1JRB*DRA2

*YIELD POINT @ .0050 EXT.

STONE & WEBSTER ENGINEERING CORP.
GULF STATES UTILITIES COMPANY
RIVER BEND STATION UNIT #1
P.O. No. 219730-C056
CONTAINMENT PERSONNEL AIR LOCK
MFG. & CONTRACTOR - GRAVER ENERGY SYSTEMS, E. CHICAGO, IND.
FAB. - IRWIN STEEL, CANTON, OHIO

Item 1.a

HEAT NO	TYPE	C	MN	P	S	SI	CU	NI	CR	MO	SN	AL	N	V	AVG GR SIZ
69E761	HEAT	21	105	009	021	20									

WE DO NOT ADD MERCURY OR MERCURY COMPOUNDS TO STEEL DURING MELTING OR ROLLING, DO NOT INTEND TO DO SO, AND KNOW OF NO WAY IN WHICH THEY COULD BE ADDED BY ACCIDENT, EXCEPT BY THE REMOTE POSSIBILITY OF THE BREAKAGE OF A MERCURY VAPOR LAMP. THERE IS, TO BE SURE, THE REMOTE POSSIBILITY THAT MERCURY COMPOUNDS CONTAINED AS CONTAMINANTS IN SUCH SUBSTANCES AS MARKING PAINT OR PICKLING ACID COULD COME INTO CONTACT WITH THE STEEL, BUT IN SUCH CASES THE CONTAMINATION WOULD BE SO SLIGHT THAT NO COMMERCIALLY AVAILABLE MEANS WOULD DETECT IT.

Item 1.b

SOP: FAB-11
ISSUED: 11/7/75

HAHN & CLAY
HOUSTON, TEXAS

-MATERIAL IDENTIFICATION-

CUSTOMER: Wolley JOB NO. N-29464

MATERIAL DESCRIPTION: 6½" Plate x Astm SA516 gr 70

HEAT NO.: B02C4453o

ITEM NO.: 1 Dwg 33322 PART collar segments

NO. OF PIECES REQUIRED: 5

NO. OF PIECES CUT FROM ABOVE MATERIAL: 5

S. W. E. C. PQC 3 INSPECTED 70

Gulf States Utility Company
River Bend Station - Unit 1
J. O. No. 12210
Equipment Hatch Assembly
ITEM 1 DWG 33322
Hahn & Clay Heavy Industries
5100 Clinton Drive
Houston, Texas 77020

MATERIAL LAYOUT BY: Joe Mathis

DATE: 1-12-81

CONFIRMED BY: C Parker

QUALITY ASSURANCE DEPARTMENT

DATE: 1-12-81

BETHLEHEM STEEL CORPORATION
METALLURGICAL DEPARTMENT

HARBOR PLANT

REPORT OF TESTS AND ANALYSES

NO	DATE SHIPPED	CAR OR VEHICLE NO	PAGE
1-08714	9-26-79		1

ROGRESSIVE FABRICATORS INC
6800 PRESCOTT AVE
ST LOUIS MO 63147

SHIP TO
PROGRESSIVE FABRICATORS INC
6800 PRESCOTT AVE
ST LOUIS MO 63147

MEAL NUMBER	PAT NO	HEAT NUMBER	SIZE AND QUANTITY NO. PCS	THICKNESS INCHES	WIDTH INCHES	LENGTH INCHES	WEIGHT POUNDS	YIELD PSI	TENSILE STRENGTH PSI	ELONG IN	ELONG %
LATES - ASME SA516 GR 70 PVQ 1974 EDITION MICRO ALLOY ADDITIONS CH-V SA20S5 MULT L 20FTLB AT +0F & GAS CUT 4 SIDES NORMALIZED FLATTENED TO STD TOL											
MFST - LIFT MAX 5 TON											
O# N-194 GH 023-1975											
LATES HEAT TREATED WITH TEST SPECIMENS ATTACHED AND YIELD STRENGTH @ .5% E.U.L.											
10358		802C44530	1	6 1/2	76	173	24237	45900	77500	2	28
				N 1550 DEG F - 205 MIN							

STONE & WEBSTER ENGR. CORP.
RIVER BEND UNIT NO. 1
CONTRACT: RBS-219.710-C033
GRAVER P. O. NO. G101CM-[illegible]
19-0" EQUIP. HATCH-HAHN-HAHN [illegible]
DESIGNED BY W. J. WOOLLEY CO.-CHICAGO, ILL.
MFG. BY PROGRESSIVE FABRICATORS INC.
ST. LOUIS, MO.

PROGRESSIVE FABRICATORS, INC.
CHEMICALS OK PHYSICALS OK
DATE 10-4-79
CHECKED B. [signature]
CHECKED BY [signature]

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

Item 1 Drwg # 33322

HEAT NO	PAT NO	HEAT NUMBER	HARD	BRND	THICKNESS INCHES	TYPE	SIZE	DIR	TEST F TEMP	CHARPY IMPACT ENERGY 1	ENERGY 2	ENERGY 3	SHEAR (%) 1	SHEAR (%) 2	SHEAR (%) 3	LAT EXP 1	LAT EXP 2	MIL
358	1	802C44530			6.500	V	FULL	L	+0	46	44	43	35	30	30	40	41	5

Gulf States Utility Company
River Bend Station - Unit 1
J. O. No. 12210
Equipment Hatch Assembly
ITEM 1 DWG 33322
Hahn & Clay Heavy Industries
5100 Clinton Drive
Houston, Texas 77020

HEAT NUMBER	CHEMICAL ANALYSIS C	Mn	P	S	Cu	Ni	Cr	Mo	V	B	Al	Si	Cb	N	MECH PROP SEE
C44530	.21	.99	.014	.017	.232										

S. W. E. C. QC INSPECTED 70

SUSCRIBED AND SWORN TO BEFORE ME
THIS 2nd DAY OF Oct, 1979
[signature]
NOTARY PUBLIC
PORTER COUNTY INDIANA
MY COMMISSION EXPIRES JULY 26, 1980

PROGRESSIVE FABRICATORS, INC.

6800 Prescott

St. Louis, Missouri 63147

P.O. No. N-194

St. Louis Testing Laboratories, Inc.

Report No. 80-7393 Date December 30 1980

Lab No. 80P4488-V

FORM S 11

	ORIGINAL		REDUCED		REDUCTION IN AREA	YIELD POINT		TENSILE STRENGTH		ELONGATION In 2 Inches	
	Diameter	Area	Diameter	Area	Per Cent	Actual	Per Sq. In.	Actual	Per Sq. In.	Inches	%
V	.508	.2027	.312	.0764	62.3	8900	43907	15450	76221	.57	28.5

6-1/2" x 6" x 6" Bethlehem Heat No. 802C44530

Yield taken at drop of dial

Gulf States Utility Company
River Bend Station - Unit 1
J. O. No 1.2.0
Equipment Hatch Assembly
ITEM 1 DWG 33322
Hahn & Clay Heavy Industries
5100 Clinton Drive
Houston, Texas 77020

S. W. E. C. POC INSPECTED 70

PROGRESSIVE FABRICATORS, INC.
CHEMICALS _____ PHYSICALS ok
DATE 1-2-81
CHECKED BY F Felber
CHECKED BY D. Fowler

Respectfully submitted, CJK

C. W. Crowbridge

C. D. TROWBRIDGE, Director

2810 CLARK AVENUE • ST. LOUIS, MO. 63103
531-8080 Code 314

Chemical, Metallurgical, Physical, Non-Destructive, Spectrographic, Agricultural Testing and Analyses

Investigations, Research and Development, Inspection, Field Services

December 30, 1980
Report No. 80-7393
Lab No. 80P4488-V
P.O. No. N-194

PROGRESSIVE FABRICATORS, INC.
6800 Prescott
St. Louis, Missouri 63147

REPORT OF CHARPY IMPACT TESTS

MATERIAL: 6-1/2" x 6" x 6" Plate, Bethlehem Heat No. 802C44530, SA 516-Gr.70, Beth. Serial No. J10358, Heat treated @ 1150°F for 1-1/2 hours per inch of thickness, furnace cool.

SPECIFICATION: ASME Code, Section SA370

SPECIMEN TYPE: "A" Vee Notch, Longitudinal

SPECIMEN SIZE: 10mm x 10mm

TEMPERATURE OF TESTS: 0°F

REQUIREMENTS: 20 ft. lbs. avg. of three specimens
15 ft. lbs. min. one specimen

	Foot Lbs.	Lateral Expansion	% Ductile Fracture
Parent Metal			
V-7	42	.037	20
V-8	48	.043	20
V-9	42	.039	20
Average:	44	.0396	

TEST RESULTS: Satisfactory

PROGRESSIVE FABRICATORS, INC.
CHEMICALS _____ PHYSICALS OK
DATE 1-2-81
CHECKED BY F Felber
CHECKED BY D Young

Gulf States Utility Company
River Bend Station - Unit 1
J. O. No. 11210

Equipment Hatch Assembly
ITEM 1 DWG 33322

Hahn & Clay Heavy Industries
5100 Clinton Drive
Houston, Texas 77020

Respectfully submitted,

Richard F. Kemlage
Physical Testing Dept.

RFK:mbn

GULF STATES UTILITIES
WEST FELICIA
RIVERBEND UNIT 1
219.710 C056
SHIPMENT No. 2

NATIONAL ANNEALING BOX CO.
WASHINGTON, PENNA.

MATERIAL RECORD

Item 2a
ZIA (SLEEVE)

Documentation
Customer GRAVER TANK & MFG. CO.

P.O. No. 61040NX70

NABCO S.O. No. C-1774-7

DRWG No. NG 3349-4 REV. 11

Type Equip.: CYLINDERS

SIZE 38.94" I.D. x 1.55" H.V.

CODE ASME SECT. III, CL. MC YEAR 1974

PART NO.	MANUFACTURER OF MATERIAL	HEAT NO.	SLAB OR TEST NO.	CHEMICAL C.	MN.	P.	S.	SIL.	CR.	NI.	MO.	PHYSICAL TENSILE	YIELD	ELONG. %	BEND*	GRAVER ITEM
1774	LUKENS 61679	D4596	1	.23	1.04	.007	.021	.25				80,400	49,700	25%	OK	X208
-1-	CHARPIES	PTL	% 62055						CHARPY V-NOTCH 0°F.			FT/LBS.	MLE	SHEAR		
38'-11"												25-20-24	27-22-21	0-0-0	BASE	MATL
												75-50-74	65-45-66	40-20-30	WELD	
1774	LUKENS 61679	D4596	4	.23	1.04	.007	.021	.25				81,000	55,000	24%	OK	X251
-3-	CHARPIES	PTL	% 62055						CHARPY V-NOTCH 0°F.			FT/LBS.	MLE	SHEAR		
41'-5½"												36-45-56	34-40-49	10-10-20	BASE	MATL
												40-35-45	32-27-39	60-60-50	WELD	
1774	LUKENS 61679	D4596	5	.23	1.04	.007	.021	.25				79,600	49,700	28%	OK	X251
-4-	CHARPIES	PTL	% 62055						CHARPY V-NOTCH 0°F.			FT/LBS.	MLE	SHEAR		
41'-5½"												32-31-37	29-30-35	15-20-20	BASE	PTL
												74-61-69	62-56-58	45-40-40	WELD	
1774	LUKENS 61679	D4596	6	.23	1.04	.007	.021	.25				79,600	54,700	26%	OK	X251
-5-	CHARPIES	PTL	% 62055						CHARPY V-NOTCH 0°F.			FT/LBS.	MLE	SHEAR		
41'-5½"												34-22-35	33-21-32	25-20-30	BASE	MATL
												50-22-63	43-22-52	30-15-40	WELD	

W. E. S. PQC MAY 21 1980 INSPECTED-163

GRAVER ENERGY SYSTEMS, INC.
EAST CHICAGO, IN
ORDER No. 161040NX 70
ITEM No. X251 pc 4
CERT. No. 61677

DATA CERTIFIED CORRECT AS CONTAINED IN THE RECORDS OF THE COMPANY

By Donna Brennen DATE 10-31-77

Item 2a

P.O. 61040NX70

NATIONAL ANNEALING BOX CO.
WASHINGTON, PENNA.

21A (SLEEVE)

PART NO.	MANUFACTURER OF MATERIAL	HEAT NO.	SLAB OR TEST NO.	CHEMICAL C.	MN.	P.	S.	SIL.	CR.	NI.	MO.	PHYSICAL TENSILE	YIELD	ELONG 2"	BEND°	GRAIN
1774	LUKENS 61679	D4602	5	.24	1.00	.006	.021	.23				80,000	45,000	24%	OK	X2
-6-	CHARPIES	PTL	P/O 62055						CHARPY V-NOTCH 0°F.			FT/LBS.	MLE	SHEAR		
41'-5½"												34-39-34	33-37-33	10-10-10	BASE	HA
												51-70-74	45-59-60	35-40-50	WELD	
1774	LUKENS 61679	A6156	1	.22	1.07	.008	.019	.18				74,600	54,700	26%	OK	X2
-11-	CHARPIES	PTL	P/O 62055						CHARPY V-NOTCH 0°F.			FT/LBS.	MLE	SHEAR		
37'-8"												34-48-40	33-42-34	20-20-20	BASE	
												184-91-121	90-67-83	100-35-50	WELD	
1774	LUKENS 61679	A6156	2	.22	1.07	.008	.019	.18				76,000	52,500	25%	OK	X2
-12-	CHARPIES	PTL	P/O 62055						CHARPY V-NOTCH 0°F.			FT/LBS.	MLE	SHEAR		
37'-8"												30-33-30	21-29-29	0-0-0	BASE	HATL
												76-81-80	69-70-66	20-20-50	WELD	

RADIOGRAPH COMPLETED WELDS 100% PRIOR TO STRESS RELIEF PER RT 75-2 & VL-10 - OK

STRESS RELIEVED PART PER HT 75-3 DATED 4/6/76 AT 1150°F ± 50°F., HOLD FOR 1-3/4 HRS. - OK

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219.710 COSG
SHIPMENT No. 2
Downer to Ivan

U.E.C. QC MAY 24 1980 INSPECTED 163

GRAVER ENERGY SYSTEMS, INC.
EAST CHICAGO, IN
ORDER No. 61040NX70
ITEM No. X0851 pc5
CERT. No.

PURCHASER:
4- NATIONAL ANNEALING BOX CO
PURCH. DEPT. PURCH. AGENT
P.O. BOX 520
WASHINGTON, PA. 15301

LUKENS STEEL COMPANY
COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 6/07/77 FILE NO 56-01-01
CONSIGNEE:

Z1A (SLEEVE)

MILL ORDER NO.	CUSTOMER P.O.	
74563 1	61679 620723	6377 DD

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

SA-516 GR. 70 S5 ASME CODE SECT. II & III SUB NE 1974 EDITION N-1160 8/4/75

BEND TEST O.K. HOMOGENEITY TEST

SHEET # 1 OF 2

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219710 EQ56
SHIPMENT NO.

GR 1-B-B
1-B-B
1-B-B
1-2

Documentation

CHEMICAL ANALYSIS

MELT NO.	C	MN	P	S	CU	SI	NI	CR	MO	V	TI	AL	B
D4602	.24	1.00	.006	.021		.23							
D4596	.23	1.04	.007	.021		.25							
A6156	.22	1.07	.008	.019		.18							

S. W. E. C. PQC MAY 21 1980 INSPECTED 1633

APPROVED
NABCO Q.A.
BY 6/9/77

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 2"	% R.A.	BHN	IMPACTS LV- 15 F			FRACTURE APPEARANCE % SHEAR	DESCRIPTION
D4602 Pc. 7	6	550	800	26			38	30	30	30-30-30	1- 1-5/8 X 127-1/2 X 506-1/4
					LATERAL EXPANSION IN INCHES		.026	.034	.029		
D4602 Pc. 8	7	505	795	22			42	30	38	30-30-30	1- "
					LATERAL EXPANSION IN INCHES		.027	.034	.038		
D4596 Pc. 4	5	497	796	28			40	48	44	40-40-40	1- "
					LATERAL EXPANSION IN INCHES		.040	.043	.037		
A6156 Pc. 13	3	515	747	23			60	68	58	60-60-60	1- 1-5/8 X 127-1/2 X 461-1/4
					LATERAL EXPANSION IN INCHES		.055	.063	.058		

GRAVER ENERGY SYSTEMS, INC.
EAST CHICAGO, IN
ORDER No. 61D4010X70
ITEM No. X251 pc 4
CERT. No. [illegible]

We hereby certify the above information is correct.

SUPERVISOR-TESTING F. H. Kline

PURCHASED:
NATIONAL ANNEALING BOX CO
PURCH. DEPT. PURCH. AGENT
P.O. BOX 520
WASHINGTON, PA. 15301

LUKENS STEEL COMPANY
CO. ILLE, PA. 19320

TEST CERTIFICATE

DATE: 5/31/77
CONSIGNED:

21A (SLEEVE)

MILL ORDER NO.	CUSTOMER P.O.	
74563 1	61679	

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

SA-516 GR. 70 65 ASME CODE SECT. II & III SUB NE 1974 EDITION N-1160 8/4/76

BEND TEST O.K. HOMOGENEITY TEST

SHEET # 2 OF 2

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219.710 CO56
SHIPMENT No. 2
Documentation

S.W.E.C. POC MAY 20 1980 INSPECTED-163

APPROVED
NABCO Q.A.
BY [signature] 6/3/77

CHEMICAL ANALYSIS

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

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PSI X100	TENSILE PSI X100	% ELONG. IN 2"	% R.A.	BHN	IMPACTS LV- 15 F			FRACTURE APPEARANCE % SHEAR	DESCRIPTION
A6136 A.H	4	400	755	26			58	58	50	50-50-50	1- 1-5/8 X 127-1/2 X 461-1/
					LATERAL EXPANSION IN INCHES		.047	.055	.054		

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

Impacts stress relieved by heating within a rate of 246°F. per hr. to 1125°F./1175°F., held 10 hrs. and furnace cooled within a rate of 246°F. per hr. to 800°F.

Mercury or mercury compounds are not used in the manufacture of Lukens' Products.

GRAVER ENERGY SYSTEMS, INC.
EAST CHICAGO, IN
ORDER No. 6D1D4DWX70
ITEM No. X251 pc5
CERT. No. [illegible]

We hereby certify the above information is correct.

SUPERVISOR-TESTING [signature]

Item 2.b
Z15 (Sleeve)

CERTIFICATE OF TEST ON PIPE MATERIAL

* CORRECTED REPORT 7/25/77

APR 16 1979

Cameron
IRON WORKS, INC.
P. O. BOX 1212
HOUSTON, TEXAS 77001

S. W. E. C. PQC INSPECTED 183

NUCLEAR

TO: GUYON ALLOYS, INC.
530 E. Swedesford Rd.
Wayne, Pa 19087

Date 12 July 1977

Customer Order No.	C.I.W. Sales Order No.	Specification
A-14188 NW	F-9104	* ASME SA333 Gr. 6 ASME Sec. III Class MC 1974 Addition - No Addendum

Description of Material: O.D. 24" x I.D. _____ x WALL SCH. 80

C.I.W. Part No. 86-9104-240-215

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

GRAVER TANK & MFG. CO. EAST CHICAGO, IN. ORDER No. 61943NX ITEM No. 002 CERT. No. 5

Heat No.	Location or Serial No.	CHEMICAL ANALYSIS C	MN	P	S	SI	CR	NI	MO
J 6694		.18	1.23	.012	.017	.29			
L 3842		.18	1.26	.010	.018	.34			

Z15 (SLEEVE)

S. W. E. C. PQC INSPECTED 83 NOV 1

Q. A. APPROVED
BY: Harry DATE: 8-15-77
GUYON ALLOYS, INC.

Qty Serial No.	Heat No.	Test Loc.	MECHANICAL PROPERTIES Tensile PSI	.2 % Offset Yield PSI	% Elong. 2 In.	% Red. Area	Macro Etch	Bend Test	Flattening Test	Specimen Size	Test Lot#
4	J 6694	Trans.	74,900	42,900	29.0	56.0			OK	.505	138
1	L 3842	Trans.	76,100	44,700	28.3	54.7			OK	.505	134

Charpy V-Notch Impact Test Results:

Forg.Ser.#	Heat#	Test Lot#	Test Lot#	Heat#	Test Temp.	Ft.Lbs.	Lat. Exp.	% D/F
#28997	J 6694	138	138	J 6694	-50°F.	85.0	73 MILS	30%
28998	J 6694	138			-50	91.0	79	35
28999	J 6694	138			-50	64.5	55	25
29000	J 6694	138			0	92.0	73	30
29001	L 3842	134			0	138.0	80	100
					0	81.0	64	35
			134	L 3842	-50°F.	25.0	24 MILS	10%
					-50	55.0	48	15
					-50	42.0	37	15
					0	56.0	50	20
					0	73.0	61	30
					0	70.0	59	25

All specimens removed in axial direction with radial notches.

Hydrostatic Test: Each length of pipe hydrostatically tested at 2100 psi for 5 sec. and found acceptable.

Heat Treatment: 1550°F., held 1 hr. at temp. Air cooled.

PUBLIC

Subscribed and Sworn to before me this 12th Day of July 1977

Notary Public

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
~~219710~~ CO56
SHIPMENT No. 2

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

Metallurgical Representative H. O. WRIGHT. /at

DOCUMENTATION

REVISED DOCUMENT PACKAGE DEC 7 1979

Item 2.c Z15 (ADAPTER)

FORM NO. 1175

NATIONAL FORGE COMPANY

MATERIAL NOTARIZATION DOCUMENTATION PACKAGE

Customer: GRAVER TANK & MFG. CO.

Forge Div. Irvine [X] Erie [ ]

Purchase Order No.: 61040NX46 PENET NO. X-132
S & W PENET. NO. Z-15

Foundry Div. [ ]

Drawing No.: 394907, REV. 2

NFC Order No.: 60-A-3949

Nomenclature: CONTAINMENT TO BELLOWS ADAPTER

NFC Serial No.: 07-001

Specification: SA-508, CLASS 1, CODE CASE 1332-6 AND 1974 EDITION (NO ADDENDA)
ASME SECT. III, CLASS MC

NATIONAL FORGE COMPANY DOCUMENTS APPROVED AND USED ON THIS CONTRACT

Ultrasonic Procedure: UT-60-A-3949/3950, DTD 1/3/77, ADD. 1, DTD 3/2/77
Magnetic Particle Procedure: MT-60-A-3949/3950, DTD 1/3/77
Heat Treat Procedure: HT-60-A-A004-0A, DTD 1/6/77
Impact Test Procedure: LT-60-A-A004-0A, REV. C, DTD 6/24/77
Forging Test Drawing:
Other:

DOCUMENTATION PACKAGE TABLE OF CONTENTS

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

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219.710 CO56
SHIPMENT No. 2
Documentation

S.W.E.C. QC APR 2 0 1980 INSPECTED-163

GRAVER ENERGY SYSTEMS INC.
EAST CHICAGO, IN
ORDER No. 61040NX46
ITEM No. X132
CERT. No. 04641

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF WARREN

R.S. NEWARK 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.S. Newark

Subscribed and sworn to before me this 10th day of October, 1977

Sally L. Vevoda

NOTARY PUBLIC

Embossed Hereon is My Notarial Seal
Notary, Warren County, Pennsylvania, Notary Public Seal
My Commission Expires January 2, 1978
SALLY L. VEVODA

FORM NO. 1056 B

NATIONAL FORGE COMPANY
QUALITY CONTROL DEPARTMENT

MATERIAL CERTIFICATION REPORT NO. 0- 10444

NFC SHOP NO. 60- 3949 SERIAL NO. #92-001
CUSTOMER GRAVER TANK & MFG. CO.
CUSTOMER ORDER NO. 61040NX46 215 (ADAPTER)

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Ni	Cr	Mo	V	Al	Cu	Co	Ti
22-4384	.21	1.06	.017	.008	.33	.12	.17	.02	.04		.06	.010	
CHECK	.21	1.02	.013	.008	.31				.02				

MECHANICAL PROPERTIES

LEGEND	SPECIMEN IDENT. NO.	TENSILE psi	YIELD psi @ .2	% ELONG	% R/A	GRAIN SIZE	HARDNESS
L = LONG	LT 12:00	75,200	48,600	33.5	73.6	10-12	
R = RAD	LB 6:00	76,200	52,400	33.5	74.4	10-12	
X = TRAN							
Y = TANG							

GRAVER ENERGY SYSTEMS, INC.
EAST CHICAGO, IN
ORDER No. 61040NX46
ITEM No. 1132
CERT. No. 04641

MANUFACTURING NOTES AND HEAT TREATMENT DATA

#92-001 IS A MULTIPLE FORGING WHICH MAKES UP THE FOLLOWING ITEMS:
60-3949-07-001,002
08-001
09-001,002,003

07-001 C' BORE DIA.
29.250" - 29.251"

TEST SPECIMENS STRESS RELIEVED TO ABOVE 800°F AT A MAXIMUM RATE OF 150°F/HR TO 1100/1175°F HELD FOR 10 HRS COOLED TO 800°F AT 150°/HR.

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219.710 CO56 2
SHIPMENT No.
Documentation

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

OPERATION	TO °F	HRS. HOLD
NORMALIZED	1680	4
AUSTENITIZED	1550	4
QUENCHED IN WATER		
AUSTENITIZED	1460	4
QUENCHED IN WATER		
TEMPERED	1180	4

IMPACT DATA

SPCMN. IDNT. NO.	°F	FT. LBS.	% SHEAR	LATERAL EXPANSION
LT 12:00	0	208.0	100	.084
		120.0	52	.076
		239.5	100	.070
LB 6:00	0	141.0	63	.092
		125.0	54	.084
		124.0	57	.082

S. W. E. C. PAC. APR 29 1980 INSPECTED 163

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

COPIES OF ACTUAL TEST DATA AVAILABLE FOR REVIEW.

CAPITOL PIPE
WORLD-WIDE

Capitol
PIPE & STEEL PRODUCTS CO.
DIVISION OF BOWLINE CORPORATION

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

CAPITOL NUCLEAR

Item 2.d
Z125 (PIPE CAP)

March 21, 1980

RECEIVED
MAR 21 1980
PURCHASING

04103

Graver Tank & Manufacturing
4809 Tod Avenue
East Chicago, IN 46312

Attention: Mr. J. Mitchell

Reference: Graver P.O.# 61040NX88 & 61060NX42
Capitol Pipe S.O.# DN 1161B

Dear John:

Enclosed please find three (3) sets of documentation covering all items of each of the above purchase orders. As discussed during our telephone conversation, the heat and temperature of charpy for each are being supplied as follows:

61040NX88	Heat #	Charpy Temp.	Quantity
Item # X247	~~7B0A0~~ 7BA0A	0	12 pieces
Item # X248	7BAR	0	8 pieces
Item # X249	7BAR	0	4 pieces
Item # X250	7BSDN	-50	4 pieces

61060NX42	Heat #	Charpy Temp.	Quantity
Item # X247	~~7B0A0~~ 7BACA	0	8 pieces
Item # X247	7ASWD	N/R*	4 pieces
Item # X248	7BAR	0	8 pieces
Item # X249	7BAR	0	2 pieces
Item # X249	7BEEC	N/R*	2 pieces
Item # X250	7BASA	-50	3 pieces
Item # X250	7BSDN	-50	1 piece

*Not Reported

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219.710 CO56
SHIPMENT No. 2
Documentation

W. E. Co
APPROVED
INSPECTED-163

Please disregard all previous documentation received on both of the above orders and replace with the enclosed.

We anticipate the documents supplied will meet with your satisfaction, however, if Capitol may be of further assistance, please feel free to contact us.

Respectfully,

Debra Kievit
QUALITY ASSURANCE

Encl.
cc: K. McGrath

Babcock & Wilcox

Tubular Products Division

P.O. Box 230, Beaver Falls, Pa. 15010

W. E. C. APR 7 QC 1980 SPECIFIED-1E3

Graver Tank &
P.O.# 61040NX88
S.O.# DN 1161B
Item # X250 (4pcs)
Z125 (PIPE CAP)

B & W ORDER NO. 095264-4

CUSTOMER CAPITOL PIPE & EEL PRODUCTS, INC.

CUST. ORDER NO. D-73396-20N

DATE 1/16/78

ITEM	PCS.	DESCRIPTION	SPECIFICATION
4	5	16" SCH 80 CAP (ITEM No. X-250) PER DRAWING S-30471	SA 234 SECTION III CLASS MC SUBSECTION NE TO WINTER 75 ADDENDA. ALL REFERENCE DOCUMENTS & NA 3700 TO LATEST A

H/NO.	HEAT CODE	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	V	N			*	ULTIMATE	YIELD	% EL.	% RA.
	7BSDN	.21	1.12	.011	.021	.21										76.4 KSI	54.1 KSI	31	

CVN	SIZE	TEMP(° F)	FT.-LBS.	% SHEAR	LAT.EXP.	CHEM. & TENSILE PROPERTIES TO	HEAT TREATMENT TO	BHN IN ACCORDANCE WITH
	F/S	-50	41-78-73	80	041-070-068	A 516 Gr 70	NORMALIZE	SA 234 Para 9.1

ITEM	PCS.	DESCRIPTION	SPECIFICATION

H/NO.	HEAT CODE	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	V	N			*	ULTIMATE KSI	YIELD KSI	% EL.	% RA.

CVN	SIZE	TEMP(° F)	FT.-LBS.	% SHEAR	LAT.EXP.	CHEM.& TENSILE PROPERTIES TO	HEAT TREATMENT TO	BHN IN ACCORDANCE WITH

ITEM	PCS.	DESCRIPTION	SPECIFICATION

ER/NO.	HEAT CODE	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	V	N			*	ULTIMATE KSI	YIELD KSI	% EL.	% RA.

CVN	SIZE	TEMP(° F)	FT.-LBS.	% SHEAR	LAT.EXP.	CHEM. & TENSILE PROPERTIES TO	HEAT TREATMENT TO	BHN IN ACCORDANCE WITH

ABBREVIATIONS: ETM=ENDS OF MATCH PTS=PLATE TYPE SCRAPER BARS T/B=TAPER BORED C/E=CENTER TO END

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219.710 CQ56
SHIPMENT No. 2
Documentation

TENSILE TEST SPECIMEN TYPE:
1. STRIP TEST OR FULL SECTION
2. STANDARD ROUND

TESTS NOT PERFORMED ON RAW MATE
☐ HYDROSTATIC
☐ FLATTENING
☐ OTHER

☐ ULTRASONICALLY INSPECTED AND ACCEPTED PER B & W PROCEDURE
☐ MAGNETIC PARTICLE INSPECTED AND ACCEPTED PER B & W PROCEDURE
☐ LIQUID PENETRANT INSPECTED AND ACCEPTED PER B & W PROCEDURE
☒ FITTINGS ARE CAPABLE OF WITHSTANDING A HYDROSTATIC TEST PRESSURE EQUAL TO THE CALCULATED TEST PRESSURE OF THE MATCHING PIPE.
☐ THE BURSTING PRESSURE OF THE FITTINGS IS AT LEAST EQUAL TO THE COMPUTED BURSTING PRESSURE OF THE MATCHING PIPE PER ☐ ANSI B16.9 ☐ MSS SP-75

GRAVER ENERGY SYSTEMS, INC.
EAST CHICAGO, IN
ORDER No. 61040NX88
ITEM No. X250
CERT. No. 04103

WE CERTIFY THAT NO MERCURY, NO MERCURY COMPOUND, OR ANY EQUIPMENT CONTAINING MERCURY, HAS BEEN USED IN ANY PHASE OF MANUFACTURE OR HAS COME IN CONTACT WITH ANY OF THE ITEMS LISTED ON THIS REPORT.

I HEREBY CERTIFY THIS REPORT TO BE TRUE AND CORRECT ACCORDING TO THE RECORDS OF THE BABCOCK AND WILCOX COMPANY.

BY Harold G. Wars
HAROLD G. WARSO

SWORN TO AND SUBSCRIBED BEFORE ME:

Gertrude T. Wilbacher 1/16/78
NOTARY PUBLIC DATE

Gertrude T. Mohrbacher, Notary Public
Borough of Koppel, Beaver Co., PA
My Commission Expires

Cameron

CAMERON IRON WORKS, INC.
P. O. BOX 1212
HOUSTON, TEXAS 77001

SOLD TO
ITT GRINNELL INDUSTRIAL PIPING, INC.
P. O. BOX 566
KERNERSVILLE, NC 27284

Item 3.a

Date 18 February 1977

Customer Order No.	C.I.W. Sales Order No.	Specification
KER 2610	F-5709	ASME SA106 Gr. B Sec. III Class 1, 1974 Edition (Impacts @ 60°F.)

Description of Material: O.D. 24" x I.D. _____ x WALL 1.066" M.W.

C.I.W. Part No. 86-5709-240-216

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

Heat No.	Location or Serial No.	CHEMICAL ANALYSIS C	MN	P	S	SI	CR	NI	MO
3459		.23	.94	.014	.018	.19			

Ultrasonically examined in accordance with approved CIW Procedure PU-33, Rev. 'A' with Addendum #5709 and found acceptable.

Quantity Se No.	Heat No.	Test Loc.	MECHANICAL PROPERTIES Tensile PSI	.2% Offset Yield PSI	% Elong. In.	% Red. Area	Macro Etch	Bend Test	Flat-tening Test	Specimen Size	Test Lot#
5	L 3459	Trans.	75,300	46,800	30.6	55.3			OK	.250	661
		Trans.	76,600	46,900	30.7	59.7			OK	.252	662

WHPD-QC 12/13/77 IWF

Forg.Ser.#	Test Lot#
~~#27557~~	661
27558	661
27559	661
27570Y	662
27560Z	662

V-Notch Impacts at 60°F.:

~~Test~~ Test Lot#	Ft.Lbs.	% D/F	Lat. Exp.
661	96.0	85%	69 MILS
	99.0	95	81
	105.0	95	80
662	90.0	80%	68 MILS
	104.0	90	78
	90.0	85	74

GE 12A+RB PE3

Charpy impacts run in accordance with approved CIW Procedure PM-129 Rev. D and found acceptable. Charpy impact specimen located in a longitudinal direction with a radial notch at mid-wall.

Pipe hydrostatically tested in accordance with approved CIW Procedure PI-15.

Hydrostatic Test: Each length of pipe hydrostatically tested at 1900 psi for 5 sec. and foudd acceptable

Heat Treatment:* Pipe has been heat treated in accordance with approved CIW Procedure PH-17 Rev. C. 1650°F. held 1 hr. at temp. Air cooled.

Subscribed and Sworn to before me this 10th Day of February 1977

Notary Public

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

Metallurgical Representative J. O. WRIGHT. /at

LATROBE FORGE & SPRING, INC.

Custom Alloy Corporation
Rt. 513
Califon, NJ 07830
ATTN: H.A. Steward, Purchasing

LATROBE, PA. 15650

CUSTOMER ORDER NO. A-3313 OUR ORDER NO. LF-16976

DATE SHIPPED 1/3/77 TO Above VIA Customer Truck

This is to certify that the chemical analysis and physical and/or mechanical test results shown below for the material shipped are correct as contained in the records of the corporation and meet the requirements of the purchase order and/or specifications.

FOR QUALITY CONTROL DEPARTMENT

.2% offset

SERIAL NO	HEAT NO	B. H. N.	Y. P. PSI	T. S. PSI	EL.	R. A.	C	MN.	P	S	SI	NI	CR	MO
- Head Fittings A01834 (dated 22		25.8"ID x 8.5"W x 36"OD March 1976) SA105 (Ref.	Dwg. #CA-01834 Rev. B (It 2 of 2) Spec. A105-73)				EV1026AQ*		*designates hold points			125 RUR		CA01833 and HB 167
27855	16474	179	53,750	78,500	34.0	66.1	.26	.84	.005	.013	.26	.20	.11	.08
858	"	163												
859	"	179												
.840	"	163												

V - Notch Charpy* - +60°F - *Axial-notch radial

	FT. LBS.	MLE	DUCTILE
1)	46	.042	35%
2)	50	.045	35%
3)	46	.042	35%

27856	"	179	60,400	79,900	34.0	67.1								
857	"	179												
841	"	163												

V - Notch Charpy* - +60°F - *Axial-notch radial

1)	96	.046	100%
2)	86	.047	95%
3)	97	.047	95%

QUENCH: 1575°F - 4-1/2 hrs.
TEMPER: 1200°F - 5-3/4 hrs.; AC
H.T. Charts enclosed with CTRs
Ultrasonic Examination per SA388, Ref. NB-2542 per QCS-13-10 Qlty Level III: No reportable indications (See enclosed reports)
NOTE: 2-9" test piece with shipment

Item 4.a

6083

PACKAGE
NOV 6 1979

Item 4.b FORM NO. 1057B
23B (FORGING)

NATIONAL FORGE COMPANY

MATERIAL CERTIFICATION DOCUMENTATION PACKAGE

Customer: GRAVER TANK & MFG. CO.

Forge Div. Irvine [X] Erie [ ]

Purchase Order No.: 61040NX4 PENET. NO. X-93
S & W PENET. NO. Z-3B

Foundry Div. [ ]

Drawing No.: 150524A, REV. 9

NFC Order No.: 60-A-1505

Nomenclature: FLUED HEAD PENETRATION

NFC Serial No.: 24-002

Specification: SA-508, CLASS 1, CODE CASE 1332-6 AND 1974 ED. (NO ADDENDA)
ASME SECT. 3, CLASS 1

NATIONAL FORGE COMPANY DOCUMENTS APPROVED AND USED ON THIS CONTRACT

Ultrasonic Procedure: UT-60-A-1505/1506, REV. A, ADD. 1, DTD 7/8/76
Magnetic Particle Procedure: MT-60-A-1505/1506, DTD 5/7/76
Heat Treat Procedure: HT-60-A-1505/1506, DTD 5/7/76
Impact Test Procedure: LT-60-A-1505-0A, REV. A, ADD. 3, DTD 2/4/77
Forging Test Drawing:
Other: HYDROSTATIC TEST PROCEDURE: 61-GP99-006, REV. B, DTD 1/28/75 AND AGENDA
S.O. 60-A-1505/1506, REV. F, DTD. 4-21-78

DOCUMENTATION PACKAGE TABLE OF CONTENTS

3 Chemistry/Mechanical/NDT Data
Transition Curve
Heat Treatment Charts/Table IV Form
Dimensional Data
Forging Material Log
Heat Stability Data

Photomicrographs
Test Material (Sep. Cover)
U-1A Form
U-2 Form
Other

RIVERBEND UNIT 1
219.710 C056
SHIPMENT No. 2 Documentation
WEST FELICIANA

S. W. E. C. PQC APP 2 1980 INSPECTED 163

GRAVER ENERGY SYSTEMS, INC.
ORDER No. 61040NX4
ITEM No. X93
PART No. 0462A

This is to certify that the material identified above has been processed, tested and inspected in accordance with the requirements of the purchase order and applicable specifications, including any amendments and conforms to the requirements thereof.

R. S. Newark
Authorized ~~Company~~ Representative

Date: 10/4/77

Sally L. Vevers

Embossed Hereon is My
Irvine, Warren County, Pennsylvania, Notary Public Seal
My Commission Expires January 2, 1978
SALLY L. VEVERS

NATIONAL FORGE COMPANY
QUALITY CONTROL DEPARTMENT

FORM NO. 105

MATERIAL CERTIFICATION REPORT NO. 0- 10436

NFC SHOP NO. 60-A- 05 SERIAL NO. 24-002
CUSTOMER GRAVER TANK & MFG. CO.
CUSTOMER ORDER NO. 61040NX4

23B (FORGING)

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Ni	Cr	Mo	V	Al	Cu	Co	Ti
12-6089	.23	1.21	.009	.008	.23	.30	.19	.07	.03		.10	.012	
CHECK	.22	1.18	.008	.008	.22				.02				

MECHANICAL PROPERTIES

LEGEND	SPECIMEN IDENT. NO.	TENSILE psi	YIELD psi @ .2	%ELONG	%R/A	GRAIN SIZE	HARDNESS
L = LONG	LA PIPE	77,500	55,700	29.5	57.6	9-10	
R = RAD	YC HEAD	77,600	55,000	30.5	69.1	10	
X = TRAN	LB PIPE	75,600	52,800	33.0	74.5	9-10	
Y = TANG							

[illegible] LAST SHIPMENT TO
ORDER NO. 61040NX4
ITEM No. X93
CERT. No. 04624

MANUFACTURING NOTES AND HEAT TREATMENT DATA

DROP WEIGHT TESTS
LA PIPE 2 NO BREAK @ -30 F
LA PIPE 1 BREAK @ -40 F

YC HEAD 2 NO BREAK @ 10 F

LB PIPE 2 NO BREAK @ -30 F
LB PIPE 1 BREAK @ -40 F

'C BORE DIA.
LONG ARM SHORT ARM
17.708" 17.708" - 17.712"

OPERATION	TO °F	HRS. HOLD
NORMALIZED	1700	9
AUSTENITIZED	1550	9
QUENCHED IN WATER		
AUSTENITIZED	1460	9
QUENCHED IN WATER		
TEMPERED	1200	9

W. E. S. C. PQC APR 23 1980 INSPECTED 163

IMPACT DATA

SPCMN. IDNT. NO.	°F	FT. LBS.	%SHEAR	LATERAL EXPANSION
LA	-40	150.0	71	.097
		66.0	45	.060
		125.0	56	.082
YC	40	112.0	76	.074
		119.0	81	.082
		114.0	77	.078
LB	-40	82.0	44	.056
		116.0	48	.084
		216.0	100	.086

TEST SPECIMEN STRESS RELIEVE: HEAT TO 800°F THEN RAISE TO 1100°F/1175°F AT 170°F/HR. MAX SOAK AT 1100°F/1175°F FOR 18 HOURS THEN COOL AT 170°F/HR TO BELOW 800°F. COOL TO ROOM TEMP. IN STILL AIR

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

ULTRASONIC INSPECTED PER APPROVED PROCEDURE AND FOUND TO BE SATISFACTORY WITH NO REPORTABLE INDICATIONS.
MAGNETIC PARTICLE INSPECTED PER APPROVED PROCEDURE AND FOUND TO BE SATISFACTO WITH NO REPORTABLE INDICATIONS
HYDROSTATIC TESTED PER APPROVED PROCEDURE AND FOUND TO BE SATISFACTORY.
TESTED AT 2500 PSI, HELD 10 MINUTES

GULF STATES UTILITIES
WEST FELICIANA
RIVERBEND UNIT 1
219710 C056
SHIPMENT No. 2

COPIES OF ACTUAL TEST DATA AVAILABLE FOR REVIEW. Documentation

ATWOOD & MORRILL LTD.

manufacturers of large high-integrity steel castings

ST. STEPHEN, NEW BRUNSWICK
CANADA. E3L-1N5
(506)466-3000

Item 5.a

Customer	Purchase Order No.	A&M Ltd. Sales No.
ATWOOD & MORRILL CO. INC.	4294	176-1054-01

Pattern No.	Serial No.	Part Name
16730	2	24" MSIV BODY

Material Spec. & Grade	Heat No.	RT. No.
ASME SA 216 WCB	20	16730-002

Nuclear Class	No. of pieces	DWG. No.
1	1	30146-101-H REV. 2

Source Inspection	Contract No.
A & M & GE	GE 20SAF779

S/N 5-13564

CERTIFIED MATERIAL TEST REPORT

The records enclosed in this folder comprise the certified material test report for the subject material.

AFFIRMATION

We certify that the contents of this report are correct and accurate and that all test results and operations performed by Atwood & Morrill, Ltd. or our subcontractors are in compliance with the material specification and appropriate material requirements of the ASME Code 1974 EDITION through N/A Addenda, Section III and the purchase order requirements.

Kenneth A. Douglas
ATWOOD AND MORRILL LTD.

Aug. 10, 1977
DATE

APPROVED
DATE 11/10/77
BY J. Coon
Q.A.
ATWOOD & MORRILL CO. INC.

AM1
11-10-77

9WRPD-QC
R.E.C.
11/14/77

A&M
Q.C.8
A

8-18-77
Level II

ATWOOD & MORRILL LTD.

manufacturers of large high-integrity steel castings

15364-01

ST. STEPHEN, NEW BRUNSWICK
CANADA, E3L-1M3
(506)466-3000

A&M S/N 5

Customer	Purchase Order No.	A&M Ltd. Sales No.
Atwood & Morrill Co., Inc.	4294	176-1054-01

Pattern No.	Serial No.	Part Name
16730	2	24" MSIV Body

Material Spec. & Grade	Heat No.	RT. No.
ASME SA 216 WCB	20	16730-002

Nuclear Class	No. of pieces	DWG. No.
1	1	30146-101-H Rev 2

Source Inspection	Contract No.
A&M & GE	GE 205 AF779

MATERIAL TEST REPORT

HEAT NO.	C	Mn	Si	P	S	Cr	Ni	Mo		
20	.23	.80	.37	.027	.009					

Yield P.S.I.	Tensile P.S.I.	Elong. %	Red. of Area %	Brinnell Hardness
48,704	70,984	30	58	

REMARKS: Charpy Impact Test 'V' Notch Tested at +60°F.

Energy Absorbed in FT-lbs.	Lateral Expansion (Mils)	% Ductile Fracture
37.5	35	10
46.5	43	10
40.5	38	10

REPORT OF
CHEMICAL & PHYSICAL
ACCEPTED

BY Beth Nadeau

DATE 9/14/77

ATWOOD & MORRILL CO. INC.
Quality Assurance

A&M Q.C. 3 A 6-30-77

"I CERTIFY THE ABOVE INFORMATION IS CORRECT"
ATWOOD & MORRILL LTD.

BY J. K. Lewis
METALLURGIST

BWRPD-QC R.E.C. 11/11/77

A&M Q.C.B. 8-18-77 Level II

11-10-77

CANN & SAUL STEEL CO.

ROYERSFORD, PA. 19468

Report of Physical Tests and/or Chemical Compositions

Item 5.b

Date 12/30/76

Customer's Order No. AM-1635 Ref. #13564-01-211

Cann & Saul Order No. 36153

Customer Atwood & Morrill Co., Inc.

Address 285 Canal St. Salem, Mass. 01970

Attention Purchasing Dept.

APPROVED DATE 1-14-77 BY ATWOOD & MORRILL CO., INC.

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CB
216149	.27	.93	.009	.018	.15		(Ladle)		
	.30	.88	.006	.014	.16		(Check)		

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	36153 1	.505	9,800	49,000	15,300	76,500	32.0	.070	65.0	143/14
Charpy Impacts "V" Notch			56 54 52	Mils Lat. Exp. @ +60°F						
			62 64 60	Ft. Lbs.						
			20 20 20	percent shear						

CHEMICAL & PHYSICAL REPORT CHECKED

BY M. Francis

DATE 1-13-77 ATWOOD & MORRILL CO. INC.

OTHER TESTS

Sonic A388, Rev. 20(4/11/75) & Add. for Covers
Mag. Part. B&PV #12, Rev. 1(5/7/75) Acceptable
Heat Treat. Proc. 5B & Addendum(10/25/74) & Addendum (11/25/75)
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 specification and the ASME Code, Section III, July 1, 1974 Ed.

Customer's Specifications: ASME SA105 QT
Charpy "V" Impact 25Mils 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:

8 - Cover Forgings per Dwg. 30861-406-D(No Rev.) for Code 30861-406-2974
Forgings serialized #1 thru 8

A&M

Inspection

A. P. Walsh Level II 12-21-76 Inspector

BWRPD-QC R.E.C. 1/17/77

CANN & SAUL STEEL CO.

M. E. Baltusavich Eng. of Tests

1-25-77

Form C-14

CANN & SAUL STEEL CO.

S/N 2 THRU 8. 13564

ROYERSFORD, PA. 19468

Report of Physical Tests and/or Chemical Compositions

Item 5.C

Date 12/17/76

Customer's Order No. AM-1635 Ref. #13654-01-002 G.E. 205-AF-779

Cann & Saul Order No. 36151

Customer Atwood & Morrill Co., Inc.

Address 285 Canal St. Salem, Mass. 01970

Attention Purchasing Dept.

APPROVED DATE 1-13-77 BY ATWOOD & MORRILL CO., INC.

CHEMICAL COMPOSITIONS

HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CB
215217	.23	1.13	.011	.028	.24	(Ladle)			
	.23	1.01	.007	.033	.29	(Check)			

Lab. No.

PHYSICAL TESTS

CUT FROM	TEST NUMBER	GAUGE	YIELD PT. LBS.	YIELD PER Square In Lbs.	BROKE AT LBS.	ULTIMATE TENSILE LBS.	ELONG %	REDUCED AREA	Reduction %	B.H.N.
Forg-ing	36151 1	.505	11,000	55,000	16,400	82,000	36.0	.064	68.0	
Charpy Impacts "V" Notch		82 81 83 Mils Lat. Exp. @ +60°F 116 106 114 Ft. Lbs. 80 80 80 percent shear								

CHEMICAL & PHYSICAL REPORT CHECKED BY M. Francis DATE 1-3-77 ATWOOD & MORRILL CO. INC.

OTHER TESTS

Sonic A388, Rev. 20(4/11/75) & Add. for Dwg. 30521-604-D: Acceptable
M.P. B&PV #12, Rev. 1(5/7/75) Acceptable
Heat Treat. Proc. #66(8/14/75) + Add.(11/25/75)
We certify that the contents of this report are correct and accurate and tha all operations performed by our company or subcontractors are in compliance with materials specification and the ASME Code, Section III, July 1, 1974 Ed

Customer's Specifications: ASME SA350 Gr. LF-2
Charpy "V" Impact 25 Mils Lat. Exp. @ +60°F

B.H.N.

Y. P.	36,000
T.	70,000
E.	22%
R.	30%

THE ABOVE TESTS COVER THE FOLLOWING MATERIAL:

7 - Poppet Forgings per Dwg. 30521-604-D(No Rev.) for Code 30521-604-2974
Forgings serialized #10 thru 16

BWRPD-QC R.E.C. 1/13/77

A&M & G.E.

A. F. Palmerlee II Inspection M QC.8 A Inspector 12-13-76

CANN & SAUL STEEL CO.

M E Baltusavich
Engr. of Tests

JOE DYSON AND SONS, INC. CERTIFIED TEST REPORT

May 5, 1976
P.O. # AM-25935
S.O. N-570
Brisch Code 34259-294-32
Heat # 8094156 Code A-56

Item 5.d

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

ITEM 223 Pcs Partial 1-7/8" - 8 UN3A x 12" Long D.E. Studs Sketch # 3730

SPECIFICATIONS: ASME SA-540 B-23, Class 5, ASME Sec. III, 1974 Class I
Atwood & Morrill Procurement Supplement - QC-110

MATERIAL: Heat # 8094156 CODE A 56

RECEIVED
MAY 13 1976
ATWOOD & MORRILL CO. INC.

LADLE ANALYSIS: C-.390 Mn-.74 Phos-.008 Sul-.013 Sil-.28 Ni-1.75 Cr-.77 Mo-.22

CHECK ANALYSIS: C-.40 Mn-.71 Phos-.011 Sul-.014 Sil-.29 Ni-1.79 Cr-.80 Mo-.25

MECHANICAL TESTS:

TENSILE	YIELD	ELONG	RED.	RC HARDNESS
147,900	129,950	17	59	33
147,150	127,950	19	58.5	32.8
144,950	126,950	16.5	57.0	32.1
145,450	126,900	17.5	59	32.3
144,850	126,850	20	61	32
143,300	128,800	20	57	31.8

MICAL & PHYSICAL
REPORT CHECKED
BY J.F. Sharp
DATE 5/20/76.
ATWOOD & MORRILL CO. INC.

CHARPY IMPACT TESTED @ +60°F or less (actual test +60°F per A-370 NB-2333 ASME Sec. III

FT/LBS.	LATERAL EXPANSION (IN.)	% SHEAR
76	.049	50
76	.048	50
76	.050	50
75	.048	50
74	.050	50
76	.049	50
71	.047	50
69	.047	50
71	.048	50
79	.054	50
78	.051	50
76	.051	50
77	.052	50
75	.052	50
75	.050	50

APPROVED
BY J.F. Sharp
DATE 5-20-76
ATWOOD & MORRILL CO. INC.

Reviewed By R. E. Champa Date 5/20/76
R. E. Champa, Quality Control Representative
General Electric Co. - DWB Projects Dept.

39 Pcs. Will Be Used On 13562-01- The Remainder of 184 Pcs. Will Be Used On 13564-1.
W.F. Stapp 5/20/76

Reviewed And Accepted For 39 Pcs On 13562-01

184 Pcs To Be Used On 13564-1

FORM NPV-1 N CERTIFICA HOLDERS' DATA REPORT FOR NUCL 3 PUMPS OR VALVES*

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

Items 5.d-5.g

1. Manufactured by Atwood & Morrill Co., Inc. Salem, Mass. 01970
(Name and Address of N Certificate Holder)
2. Manufactured for Stone & Webster Engineering Co. Boston, Mass.
(Name and Address of Purchaser or Owner)
3. Location of Installation Riverbend Station Unit 1 St. Francisville, LA.
(Name and Address)
4. Pump or Valve Valve. Nominal Inlet Size 20 (inch) Outlet Size 20 (inch)

	(a) Model No., Series No. or Type	(b) N Certificate Holder's Serial No.	(c) Canadian Registration No.	(d) Drawing No.	(e) Class	(f) Nat'l. Bd. No.	(g) Year Built
(1)	20" Check	1-13464-04	N/A	13464-04-H	1	N/A	1982
(2)	Valve			Rev.9			
(3)							
(4)							
(5)							
(6)							
(7)							
(8)							
(9)							
(10)							

S. W. E. C. PQA INSPECTED 2-12

5. Reactor Feedwater System
(Brief description of service for which equipment was designed)

6. Design Conditions 2000 (Pressure) psi 450 (Temperature) °F or Valve Pressure Class N/A (1)
7. Cold Working Pressure 2250 psi at 100°F.
8. Pressure Retaining Pieces

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
Body RT# U2456	SA 216 Gr. WCC	Quaker Alloy	Ht.# F9769
Disc RT# U2270	SA 216 Gr. WCC	Quaker Alloy	Ht.# F9574
Brg. Cover RT# U2253	SA 216 Gr. WCC	Quaker Alloy	Ht.# D4704
Stuff. Box RT# W1784	SA 216 Gr. WCC	Quaker Alloy	Ht.# B6167
(b) Forgings			
Load Key	SA 182 Gr. F6	Cann & Saul	Ht.# 32907

GULF STATES UTILITIES INC.
RIVER BEND STN UNIT 1
P.O. 228.218-062 J.O. 12210.50
Check Valves / E21 AOV F032A
Atwood & Morrill Salem, MA

(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.

(10/77) This form (E00037) may be obtained from the Order Dept., ASME, 345 E. 47th St., New York, N.Y. 10017

5

Mark No.	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
Studs	SA 540 Gr. B23 Cl.5	Ronson Manufacturing, Inc.	Ht.# 84554 Trace #V13
Nuts	SA 540 Gr. B23 Cl.5	Ronson Manufacturing Inc.	Ht.# 45761 Trace #V12
(d) Other Parts			
Cover	SA 516 Gr. 70	Hub, Inc.	Ht.#B6922
Pipe 1"	SA 106 Gr. B	Guyon Alloys, Inc.	Ht.#KC6762
Pipe 3/4"	SA 106 Gr. B	Guyon Alloys, Inc.	Ht.#228142
Pipe 1/4"	SA 106 Gr. B	Guyon Alloys, Inc.	Ht.#E70393

9. Hydrostatic test 3375 psi. Disk Differential test pressure 2250 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 N/A (Date), Code Case No. N/A Date N/A

Signed Atwood & Morrill Co., Inc. (N Certificate Holder) by [signature] QA MGR 9/30/82

Our ASME Certificate of Authorization No. N-1766 to use the N (N) symbol expires 5-20-83 (Date).

CERTIFICATION OF DESIGN

Design information on file at Atwood & Morrill Co. Inc.

Stress analysis report (Class 1 only) on file at Atwood & Morrill Co., Inc.

Design specifications certified by (1) John E. Conway, Jr.

PE State Louisiana Reg. No. 14255

Stress analysis certified by (1) Paul A. Syrakos

PE State Mass. Reg. No. 27917

(1) Signature not required. List name only.

S.W.E.C. PQA INSPECTED 212

GULF STATES UTILITIES INC.
RIVER BEND STN UNIT 1
P.O. 228.218-062 J.O. 12210.50
Check Valves 1821 AOV F037A
Atwood & Morrill Salem, MA

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 18 OCT 1982, 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 18 OCT 1982.

[signature] (Inspector) Commissions 8285-756 (Nat'l Bd., State, Prov. and No.)

Item 5.e - Body

ALLOY RODS DIVISION
CHEMETRON CORPORATION
P.O. BOX 517 HANOVER, PA 17331 717-637-6511

QA 3 1/29/81

CERTIFICATE OF ANALYSIS

R.T.S/N 2-2456

NUCLEAR

CERTIFIED MATERIALS TEST REPORT

CORRECTED CERTIFICATION

QUAKER ALLOY
CASTING CO.
REF. P.O. 001232
MYERSTOWN, PA 17067

Customer Order No. 5970

Order No. 125679-1

Shipped:

This Material Conforms to Specification AWS A5.1-78 & ASME SFA 5.1 SEC. II PART & ASME B&PVC SEC. III 1980 ED. THRU SUMMER 1980 ADD. QA-SMA-1 REV 0.

S.W.E.C. PQA INSPECTED-212

Trade Name or Trademark:	Atom Arc 7018
Diameter Size:	3/16"
Weight:	5000 LBS.
Lot Number:	3L012P01
Heat Number:	422L657T

Type: E-7018

Test No. 5837
Control No. ZZZ096
X-Rays Satisfactory

Moisture @ 1800° F. 0.13%
Concentricity 4%
Type Steel A-285

Carbon	.03
Manganese	1.15
Chromium	.04
Nickel	.06
Silicon	.38
Columbium+ Tantalum	
Molybdenum	.01
Tungsten	
Copper	.06
Titanium	
Phosphorus	.011
Sulphur	.014
Vanadium	.01
Cobalt	

Ferrite:

Test No. Tensiles & Impacts	Full 2	Split 6	Volts 25	Amps 225 DC

Test Results:	As Welded	Stress Relieved 8 hrs. @1150° F.
Yield	62,500	58,000
Tensile	75,500	72,600
Elongation	35.0%	34.0%
Red. of Area	77.6%	77.5%

Charpy V-Notch Impacts Tested @ -20° F.

Impacts	206-235-208	107-90-154
Lat. Exp.	94-87-81	84-70-89
% Shear	100-100-100	40-40-60

PREHEAT 225°F
INTERPASS 300°F

Tensile Specimen .505"
Impact Specimen .394" x .394"

Fillets: OK Horizontal

Quality Systems No. N-1224
Expiration Date: September 8, 1981

State of Pennsylvania }
County of York } SS

Subscribed and sworn to before me this 30th day of January 1981

Kay Hohman
Notary Public

SEAL.....

My Commission expires: 11/22/82

The undersigned certifies that the contents of this report are correct and accurate and that all operations performed by the undersigned or sub contractors are in compliance with requirements of the material specification and ASME Boiler and Pressure Vessel Code Section III Division I Subsection NCA-3800

ALLOY RODS DIVISION
Chemetron Corporation

BY.....
J. L. Starner

A&M QC.B A 3-11-81 Level III

A&M certifies that this material meets or exceeds the requirements of 19__ Code and NO Addenda.

BBV 4-30-82

GULF STATES UTILITIES INC.
RIVER BEND STN UNIT 1
P.O. 228.218-062 J.O. 12210.50
Check Valves 1821 A01 F032A
Atwood & Morrill Salem, MA

QUAKER ALLOY CASTING CO., MYERSTOWN, PA.

CUSTOMER Atwood & Morrill PURCHASE ORDER AM23083 CONTRACT NO. N/A

SHOP ORDER J0806-01 Q DESIGNATION Q70-1 PATTERN NO. 16702-30266-603

MATERIAL SPEC. & GRADE ASME SA216 Gr. WCC DESCRIPTION Body SIZE 20"

HEAT NO. F9760 CASTING SERIAL NO. F9769-1 R.T. SERIAL NO. U2456

NUCLEAR CLASS N1 PCS. COVERED ON THIS REPORT 1 SOURCE INSPECTION Atwood

HEAT TREATEMENT RECORD

PROCESS*	N	T	PWHT	
PROCEDURE	QAP-H-71-02	same	QAP-WT-101 Part	A&B
DATE	11-19-80	11-19-80	2-10-81	
FURNACE	Flynn & Drefinn	Gas Machine	Gas Machine	
CHARGE NO.	FD-11-19-80-1	GM-11-9-80-2	GM-2-10-81-1	
CHARGE TEMP.	90°F	195°F	150°F	
TIME TO EQUIL. TEMP.	3Hr. 10 Mins	45 Mins	50 Mins	
HOLDING TEMP.(RANGE)	1690-1710°F	1200-1250°F	1200-1250°F	
TIME AT TEMP.	5Hrs.	5Hr. 10 Mins	4Hr. 40 Mins	
COOLING DATA	AIR	AIR	AIR	

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 Deb Dalida
Quaker Alloy Casting Co.

A&M N.D.E. A 3-11-81 Level III

TITLE Q.C.CLERK

DATE 2-20-81

Form 212 Rev. 1
12/20/76

S.W.E.C. PQA INSPECTED 212

GULF STATES UTILITIES INC.
RIVER BEND STN UNIT 1
P.O. 228.218-062 J.O. 12210.50
Check Valves 1821 AOV F032A
Atwood & Morrill Salem, MA

Cover-1314y-04

J3443N

T-2163

PURCHASER:
3 • MILLS ALLOY STEEL COMPANY
P. O. BOX 187
TWINSBURG, OHIO
44087

LUKENS STEEL COMPANY

COATESVILLE, PA. 19320

TEST CERTIFICATE

DATE: 9/09/81
CONSIGNED: ATWOOD & MORRILL AM 3.295

FILE NO. 5246-01-01

MILL ORDER NO.	CUSTOMER P.O.		
5797411	1771-KSN	9381 WL L 9881	

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

SA-516 GR. 70 65 814
OSC-218 8/4/81
BEND TEST D.K. HOMOGENEITY TEST

ASME CODE SECT II & III SUB NCA 1980 ED THRU SUM 1980 ADD

CHEMICAL ANALYSIS

MELT NO.	C	Mn	P	S	Cu	Si	Ni	Cr	Mo	V	Ti	Al	B		GRAIN SIZE
B6922	.26	1.03	.014	.015		.31									7-8

PHYSICAL PROPERTIES

MELT NO.	SLAB NO.	YIELD PT. 0.2%	TENSILE PSI	% ELONG IN 2"	% R.A.	BEND	IMPACTS LV- 20 F			FRACTURE APPEARANCE % SHEAR	DESCRIPTION
B6922	1	487	846	26	LATERAL EXPANSION		30 .036	30 .027	38 .027	20-20-20	1- 5 X 96 X 192

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

REPORT OF CHEMICAL & PHYSICAL ACCEPTED
BY W. T. Brooks
DATE 9-28-82
ATWOOD & MORRILL CO. INC.
Quality Assurance

ANI 9-29-82

QA REVIEWED 9/14/81

We hereby certify the above information is correct.

RECEIVED SEP 14 1981

C. F. Kline

INSPECTED S.W.E.C. P&V 212

HUB INC. QSC APPROVED QA MGR 9-24-82 ENERGY AND

GULF STATES UTILITIES INC.
RIVER BEND STN UNIT 1
P.O. 228.218-052 J.O. 12210.50
Check Valves 1B21-AOVF032A
Atwood & Morrill Salem, MA

Item 5.f - Cover

(61)

Item 5.g - Disc

(QA 3) 9/15/80

ALLOY RODS DIVISION
CHEMETRON CORPORATION
P.O. BOX 517 HANOVER, PA 17331 717/637-8911

NUCLEAR

CERTIFICATE OF ANALYSIS

CERTIFIED MATERIALS TEST REPORT P.T.s/w 4-2270

Quaker Alloy Casting
1190 Graham Rd.
REF: PO 000274 & 000273
Myerstown, PA 17067

Quaker P. O. 000274

Customer Order No. 5810

Order No. 189673-1

Shipped:

This Material Conforms to Specification AWS A5.1-78 ASME SFA 5.1 Sec.II Part C & ASME B&PVC Sec.III NB-2400 1977 Ed. thr Wntr. 1979 Add. Quaker Q001 Rev. E.

Trade Name or Trademark: Atom Arc 7018

Diameter Size: 3/16"

Weight: 5,000 lbs.

Lot Number: 3F020P02

Heat Number: 411K8501

Type: E 7018

Test No. 5070
Control No. YYY036
X-Rays Satisfactory

S.W.E.C. PQA INSPECTED 212

Moisture @ 1800° F. 0.20%
Concentricity 3%
Type Steel A-285

Carbon	.05
Manganese	1.06
Chromium	.03
Nickel	.02
Silicon	.41
Columbium+ Tantalum	
Molybdenum	.01
Tungsten	
Copper	.01
Titanium	
Phosphorus	.010
Sulphur	.014
Vanadium	.02
Cobalt	

Test No.	Full	Split	Volts	Amps
Tensiles & Impacts	2	/ 6	23	215 DC+

Test Results:	As Welded	Stress Relieved 16 hrs.@ 1150° F.
Yield	60,500	57,000
Tensile	77,700	71,400
Elongation	30.0%	34.0%
Red. of Area	76.3%	58.0%

Charpy V-Notch Impacts Tested @ -20° F.

Impacts	27-126-110-35-128	263-155-127-66-26
Lat. Exp.	28-83-83-33-87	75-92-84-49-80
% Shear	20-80-40-20-60	100-80-60-20-100

Preheat 225° F.
Interpass 300°F.

Tensile Specimen .505"
Impact Specimen .394" x .394"

Fillets: OK Horizontal

Quality Systems No. N-1224
Expiration Date: September 8, 1981

State of Pennsylvania)
County of York) SS

Subscribed and sworn to before me this 28th day of August 1980

SEAL Kay Feldman
Notary Public

My Commission expires: 11/22/82

The undersigned certifies that the contents of this report are correct and accurate and that all operations performed by the undersigned or sub contractors are in compliance with requirements of the material specification and ASME Boiler and Pressure Vessel Code Section III Division I Subsection NCA-3800

ALLOY RODS DIVISION
Chemetron Corporation

BY D.A. Smith
D.A. Smith

A&M certifies that this material meets or exceeds the requirements of 1971 Code and no Addenda.

A&M Q.C.B A 12-23-80 Level III

GAI 9-3087

GULF STATES UTILITIES INC.
RIVER BEND STN UNIT 1
P.O. 226.218-062 J.O. 12210.50
Check Valves 1B21 AOVF032B
Atwood & Morrill Salem, MA

45

QUAKER ALLOY CASTING CO., MYERSTOWN, PA.

CUSTOMER Atwood & Morrill PURCHASE ORDER AM23083 CONTRACT NO. N/A

SHOP ORDER JO806-01 Q DESIGNATION Q70-1 PATTERN NO. 16699-30545-403

MATERIAL SPEC. & GRADE ASME SA216 Gr.WCC DESCRIPTION Disc SIZE N/A

HEAT NO. F9574- CASTING SERIAL NO. F9574-1 R.T. SERIAL NO. U2270

NUCLEAR CLASS N1 PCS. COVERED ON THIS REPORT 1 SOURCE INSPECTION Atwood & Morrill

HEAT TREATMENT RECORD

PROCESS*	N	T		
PROCEDURE	QAP-H-71-02	SAME		
DATE	10-30-80	10-31-80		
FURNACE	Flynn & Drefinn	Gas Machine		
CHARGE NO.	FD-10-30-80-1	GM-10-31-80-1		
CHARGE TEMP.	80°F	100°F		
TIME TO EQUIL. TEMP.	2Hrs.	40 Mins		
HOLDING TEMP.(RANGE)	1700-1730°F	1225°F		
TIME AT TEMP.	4Hr. 15 Mins	4Hr. 5 Mins		
COOLING DATA	AIR	AIR		

S.W.E.C. PQ4 INSPECTED-212

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 Del Dolidan
Quaker Alloy Casting Co.

TITLE Q.C. Clerk

DATE 12-15-80

A&M Q.C.8 A 12-23-80 Level III

Form 212 Rev. 1
12/20/76

GULF STATES UTILITIES INC.
RIVER BEND STN UNIT 1
P.O. 228.218-062 J.O. 12210.50
Check Valves 1B21 AOV F032 A
Atwood & Morrill Salem, MA

40