



GULF STATES UTILITIES COMPANY

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February 7, 1984
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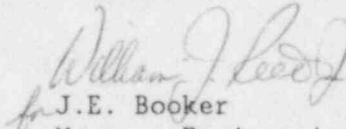
Mr. Harold R. Denton
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

River Bend Station Units 1 & 2
Docket No. 50-458/50-459

Enclosed for your review is Gulf States Utilities Company's (GSU) supplemented responses to NRC items identified by the Nuclear Regulatory Commission's Materials Engineering Branch (MTEB). This letter supplements information contained in docketed correspondence from J.E. Booker to H.R. Denton dated November 21, 1983 and December 21, 1983. Attachment 1 summarizes the supplement items and indicates changes to be made in the River Bend Station Final Safety Analysis Report (FSAR). Attachment 2 provides the response and reference material for each item. Where indicated, these responses will be provided in a future amendment to the FSAR.

Sincerely,


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

JEB/WJR/ERG ^{gjk} RJK/je

Attachments - 40 copies

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PDR ADOCK 05000458
A PDR

Boo!
1/40

Attachment 1

MTEB Items

<u>Item</u>	<u>DSER Section</u>	<u>Related Question</u>	<u>Subject</u>	<u>FSAR Change</u>
11/21/83 Submittal #1.	5.3.1 pg. 5-27	Q#252.1	Vessel Specimen Surveillance	5.3.1.6
12/21/83 Submittal			10CFR50, Appendix A General Design Criteria 51	

Attachment 2

MTEB Items

Supplemental Information to the November 21, 1983 Response Item No. 1

Additional information is provided in response to Question 252.1 regarding the base metal, heat affected zone (HAZ), and weld metal material heat numbers used for the RBS reactor vessel test specimen (Enclosure 1). The unirradiated Charpy V-notch baseline data transition curves for the base metal, HAZ, and weld metal materials have been calculated to identify the upper and lower shelf limits. The RBS reactor vessel surveillance program will follow the guidance provided in ASTM E-185-73 as required by 10CFR50, Appendix H. The RBS FSAR is being revised in accordance with the new 10CFR50, Appendices G & H criteria as published in the May 27, 1983 Federal Register (48FR24008).

Supplemental Information to the December 21, 1983 Response

The correction and editorial changes discussed with the MTEB have been incorporated in Enclosure 2. Those items affected in GSU's December 21 submittal are 1(a), 1(b), 4(c), 5(a), 5(c), 5(e), and 5(g) of Attachment 1.

RBS FSAR

7. Fracture Toughness Margins in the Control of Reactivity (Reference G-IV A.2(c))

Appendix G of ASME Section III (1971 Edition with Addenda to and including Summer 1973) Protection Against Non-ductile Failure, was used in determining pressure/temperature limitations for all phases of plant operation. Additionally, when the core is critical a 40°F temperature allowance is included in the reactor vessel operating pressure versus temperature limits to account for operational occurrences in the control of reactivity as described in GE BWR Licensing Topical Report NEDO-21778-A and the NRC acceptance basis which is included therein.

8. Results of chemical analysis and RT_{NDT} evaluations are in Table 5.3-1.

5.3.1.6 Material Surveillance

5.3.1.6.1 Compliance with Reactor Vessel Material Surveillance Program Requirements

The materials surveillance program monitors changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region resulting from their exposure to neutron irradiation and thermal environment.

Reactor vessel materials surveillance specimens are provided in accordance with requirements of ASTM E185-73 and 10CFR50, Appendix H. Materials for the program are selected to represent materials used in the reactor beltline region. Specimens are manufactured from a plate actually used in the beltline region and a weld typical of those in the beltline region and thus represent base metal, weld material, and the weld heat affected zone material. The plate and weld are heat treated in a manner which simulates the actual heat treatment performed on the core region shell plates of the completed vessel.

Insert A

~~Each in-reactor surveillance capsule contains 36 Charpy V-notch specimens. The capsule loading consists of 12 specimens each of base metal, weld metal, and heat-affected zone material.~~ A set of out-of-reactor baseline Charpy V-notch specimens and archive material are provided with the surveillance test specimens.

Insert B

Three capsules are provided in accordance with the requirements of 10CFR50, Appendix H since the predicted end-of-life adjusted reference temperature of the reactor vessel

ENCLOSURE 1 (Cont'd)

INSERT A

The plate and heat affected zone (HAZ) heat numbers and chemical compositions are provided in Table 5.3-1. Those heat numbers labeled with an asterick on Table 5.3-1 are the materials selected for use as RBS reactor vessel test specimen. The preheat treatment procedure requires a minimum preheat of 300 F be applied uniformly to the full thickness of the weld joint and adjacent base material for a minimum distance of "T" or "6 inches" whichever is least, where "T" is the material thickness. A minimum temperature of 300 F will be maintained until the start of post weld heat treatment except for longitudinal and circumferential shell and head seams, preheat may be dropped to 250 F minimum, eight hours after completion of welding. The interpass temperature will not exceed 500 F maximum. The procedure requires post weld heat treatment at a temperature of $1150\text{ F} \pm 25\text{ }^{\circ}\text{F}$ for a period of 50 hours.

INSERT B

There are three surveillance capsules each containing 36 Charpy V-notch specimens (i.e. 12-transverse base metal, 12-HAZ material, and 12-weld metal). The weld specimen electrode type is CBI 1NMM or equal. The lot identification, chemical composition, and heat and flux type is provided in Table 5.3-1. Bare rod (i.e. both single and tandem wire) is used in the submerged arc welding process.

RBS FSAR

TABLE 5.3-1

RIVER BEND STATION UNIT 1 REACTOR VESSEL CHARPY TEST RESULTS
VESSEL BELTLINE CHEMICAL COMPOSITION1) Vessel Plate (Beltline)

Heat Number	C	Mn	Si	P	S	Percent		Mo	V
						Ni	Cu		
C3138-2	0.19	1.37	0.25	0.012	0.015	0.63	0.08	0.58	-
C3054-1	0.19	1.30	0.26	0.007	0.020	0.70	0.09	0.57	-
* C3054-2	0.19	1.30	0.26	0.007	0.012	0.70	0.09	0.57	-

2) Vessel Welds (Beltline)

Heat/Lot No.	C	Mn	Si	P	S	Percent		Mo	V
						Ni	Cu		
492L4871/ A421E27AE	0.07	1.06	0.37	0.018	0.025	0.95	0.04	0.50	0.02
* 492L4871/ A421E27AF	0.07	1.17	0.32	0.020	0.020	0.98	0.03	0.51	0.02
5P6756/0342(1)	0.078	1.24	0.53	0.010	0.012	0.92	0.09	0.46	0.006
5P6756/0342(2)	0.063	1.27	0.57	0.010	0.011	0.93	0.09	0.45	0.006

1) Vessel Plate (Beltline)

Heat Number	Start	R.G. 1.99		EOL	Transverse Charpy Upper Shelf (ft-lb)
	RT NDT °F	Extrap.	RT NDT °F	RT NDT °F	
C3138-2	+9		42	51	86, 74, 78
C3054-1	-20		35	15	94, 93, 93
* C3054-2	+2		35	37	92, 102, 92

2) Vessel Welds (Beltline)

Heat/Lot No.	Start	R.G. 1.99		EOL	Transverse Charpy Upper Shelf (ft-lb)
	RT NDT °F	Extrap.	RT NDT °F	RT NDT °F	
492L4871/ A421E27AE	-60		64	4	151, 160, 161
492L4871/ A421E27AF	-50		71	21, limit- ing weld	126, 129, 136
5P6756/0342(1)	-50		42	-8	195, 99, 96
5P6756/0342(2)	-60		42	-18	89, 94, 91

(1) Tandem wire process
(2) Single wire process

*Selected for reactor vessel test specimen

Enclosure 1 (Cont'd)

Page 3 of 3

ENCLOSURE 2

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.

4. Flued Heads

- b. SA-508, Class 1, normalized, quenched, and tempered material applied for the main feedwater flued heads with a minimum allowable 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.

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, Table 4.4 assigns an (NDT + 1.3σ) NDT of +57 F. Since the material was normalized and tempered, the Tndt can be assumed, based on Figure B.2 data, to be or below +35 F NDT of Table 4.4. 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.
- c. SA-350, Grade LF2, quenched and tempered material (Cann & Saul Heat Treatment No. 66) 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.

- 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 ($\overline{\text{NDT}} + 1.3\sigma$) 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.
- 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, Table 4.4, for check valve disc, assigns an ($\overline{\text{NDT}} + 1.3\sigma$) NDT of +57 F; Figure B.2 assigns 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.



ATWOOD & MORRILL LTD.

manufacturers of large high-integrity steel castings

ST. STEPHEN, NEW BRUNSWICK

CANADA, E3L-1A15
(506)466-2000

Item 5.a

Customer ATWOOD & MORRILL CO. INC.		Purchase Order No. 4294		Valve body ASH Ltd. Sales No. 176-1054-01	
Pattern No. 16730	Serial No. 2	Part Name 24" MSIV BODY			
Material Spec. & Grade ASME SA 216 WCB		Heat No. 20	RT. No. 16730-002		
Nuclear Class 1	No. of pieces 1	DWG. No. 30146-101-H REV.2			
Source Inspection A&M d GE		Contract No. 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



11/14/77



8-18-77 Level II

AM:1
11-10-77



ATWOOD & MORRILL LTD.

manufacturers of large high-integrity steel castings

1556-4-01
ST. STEPHEN, NEW BRUNSWICK

CANADA, C.I.L. 1413
(306) 466-3000

Item 5a (Cont'd) Item 5/N 5

Customer Atwood & Morrill Co., Inc.		Purchase Order No. 4294		A&M Ltd. Sales No. 176-1054-01	
Pattern No. 16730		Serial No. 2		Part Name 24" MSIV Body	
Material Spec. & Grade ASME SA 216 WCB		Heat No. 20		RT. No. 16730-002	
Nuclear Class 1		No. of pieces 1		DWG. No. 30146-101-H Rev 2	
Source Inspection A&M & GE		Contract No. 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 Ruth Niedzwiedz

DATE 9/14/77

ATWOOD & MORRILL CO. INC.

Quality Assurance

"I CERTIFY THE ABOVE INFORMATION IS CORRECT"

ATWOOD & MORRILL LTD.



6-30-77



BY

J. H. Lewis
METALLURGIST

8-18-77
A&M Q.C. 3
Level II

11-10-77

11/11/77
4 of 10



Enclosure 2 (cont'd.)
ATWOOD & MORRILL LTD.
manufacturers of large high-integrity steel castings

Item 5.a (cont'd.)
CANADA, E3L-1113
(506) 466-3023

Customer Atwood & Morrill Co., Inc.		Purchase Order No. 4294		A&M Ltd. Sales No. 176-1054-01	
Pattern No. 16730	Serial No. 2	Part Name 24" MSIV Body			
Material Spec. & Grade ASME SA 216 WCB		Heat No. 20		RT. No. 16730-0D2	
Nuclear Class 1	No. of pieces 1	DWG. No. 30146-101-H Rev 2			
Source Inspection A&M & GE		Contract No. GE 205 AF779			

HEAT TREATMENT RECORD

PROCESS*	N	T	PWHT
	4-1054-01 Rev 2	4-1054-01 Rev 2	93-46-101
PROCEDURE	12-15-76	12-15-76	8-2-77
DATE	4-22-77	4-24-77	8-9-77
FURNACE	1	1	1
CHARGE NO.	114	115	145
CHARGE TEMP.	70°F	70°F	70°F
TIME TO EQUIL. TEMP.	11 1/2 hrs.	10 hrs.	10 1/2 hrs.
HOLDING TEMP. (RANGE)	1650 - 1690°F	1160 - 1200°F	1160-1190°F
TIME AT TEMP.	10 hrs.	9 1/4 hrs.	9 hrs.
COOLING DATA	Air Cool	Air Cool	Furnace Cool to (100°F/hr.) Air Cool

REMARKS:

* ACTUAL HEAT TREAT CHARTS ARE RETAINED IN FILE FOR THE ABOVE.

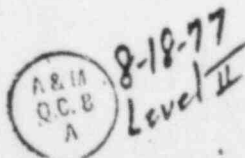
*N = Normalize or homogenize
Q = Quench or harden
T = Temper
SA = Solution Anneal
PWHT = Post Weld Heat Treat (Stress relieve)

PREPARED BY

ATWOOD & MORRILL LTD

TITLE Metallurgist

DATE August 2, 1977



Enclosure 2 (cont'd.)



ATWOOD & MORRILL LTD.

manufacturers of large high-integrity steel castings

Item 5a (cont'd.)

ST. JOHN'S, NEW BRUNSWICK

CANADA, E3L-1M3
(506) 466-3000

Customer Atwood & Morrill Co., Inc.		Purchase Order No. 4294	A&M Ltd. Sales No. 176-1054-01
Pattern No. 16730	Serial No. 2	Part Name 24" MSIV Body	
Material Spec. & Grade ASME SA216 WCB		Heat No. 20	RT. No. 16730-002
Nuclear Class 1	No. of pieces 1	DWG. No. 30146-101-H Rev. 2-	
Source Inspection A & M & GE		Contract No. GE 205 AF779	

HEAT TREATMENT RECORD

PROCESS*	PWHT	
	93-41-101	
	93-46-101	
PROCEDURE	8-2-77	
DATE	8-24-77	
FURNACE	1	
CHARGE NO.	149	
CHARGE TEMP.	70°F	
TIME TO EQUIL. TEMP.	11 hrs.	
HOLDING TEMP. (RANGE)	1150 - 1235	
TIME AT TEMP.	6 hrs.	
COOLING DATA	Furnace Cool to 800° 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 M. L. L...
ATWOOD & MORRILL LTD

TITLE Metallurgist

DATE: August 26, 1977



11/14/77



QUAKER ALLOY CASTING CO.
a division of HARSCO corp.
MYERSTOWN, PA. 17067

Item 5e
20" 900# Body

13464-04A
NUCLEAR

CERTIFICATE OF ACCEPTANCE ON QUALITY EXAMINATION AND INSPECTION

CUSTOMER Atwood & Morrill PURCHASE ORDER AM23083 CONTRACT N/A
PATTERN 16702-30266-603 DRAWING 30266-603H Rev. 2 DESCRIPTION Body SIZE 20"
MATERIAL SPECIFICATION ASME SA216 Gr. WCC GRADE WCC Q. DESIGNATION Q70-1
HEAT F9769 CASTING SERIAL F9769-1 R.T./U.T. SERIAL U2456 SHOP ORDER 56402 JOB FILE J0806-01
NO. PIECES 1 SOURCE INSPECTION Atwood QUALITY SYSTEM ASME Section III NA3700
ASME B&PV CODE, 1974 EDITION, THRU 19 ADDENDA. NUCLEAR CLASS QA-R-M-N1

VERIFICATION AND CERTIFICATION

REQUIRED	EXAM./INSPECT	APPROVED PROCEDURES	SIGNATURE*	LEVEL*	DATE
<input checked="" type="checkbox"/> 100% (Max. Feasible Coverage) <input type="checkbox"/> PARTIAL <input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> RADIOGRAPHY <input type="checkbox"/> ULTRASONIC	<u>QAP-R-31-08</u>	<u>J. Kammel</u>	<u>III</u>	<u>2-4-81</u>
<input checked="" type="checkbox"/> 100% (Max. Feasible Coverage) <input type="checkbox"/> PARTIAL <input type="checkbox"/> PARTIAL (REPAIRS ONLY)	<input checked="" type="checkbox"/> MAG. PARTICLE <input checked="" type="checkbox"/> WET <input type="checkbox"/> DRY <input type="checkbox"/> PENETRANT**	<u>QAP-M-33-01</u>	<u>Harry Redinger</u>	<u>II</u>	<u>2-18-81</u>
<u>GULF STATES UTILITIES INC.</u> <input checked="" type="checkbox"/> <u>RIVER BEND STN UNIT 1</u> <u>P.O. 228.218.062 J.O. 12210.50</u> <u>Check Valves 1B21 AOV F032A</u>	<u>VISUAL</u>	<u>MSS-SP-55</u>	<u>Harry Redinger</u>	<u>II</u>	<u>2-18-81</u>
<input checked="" type="checkbox"/> <u>Atwood & Morrill Salem, MA</u>	<u>DIMENSIONAL</u>	<u>DWG # 30266-603H Rev. 2</u>	<u>Edon S. ...</u>		<u>2-18-81</u>
<u>RANGE</u>	<u>BRINELL HARDNESS</u>	<u>BHN.</u>			

*QUALIFICATION RECORDS AS APPROPRIATE ACCORDING TO SNT-TC 1A, NAVSHIPS 250-1500-1 OR MIL STD 271 ARE MAINTAINED AND ON FILE FOR REVIEW UPON REQUEST.
**ALL LIQUID PENETRANT MATERIALS USED MEET THE REQUIREMENTS OF APPLICABLE CODES. MATERIAL CERTIFICATES OF ANALYSIS ARE MAINTAINED AND ON FILE FOR REVIEW UPON REQUEST.

WE CERTIFY CORRECTNESS OF THE ABOVE INFORMATION
AND THAT THE MATERIAL LISTED IS ACCEPTABLE TO THE STATED REQUIREMENTS

FORM 113 REV 2, 5/79

TRANSMITTAL NO. 01308



3-11-81
Level III

Det. Holiday

Signed

QUAKER ALLOY CASTING CO.

2-20-81

Date

Enclosure 2 (encl.)

13464-04A



QUAKER ALLOY CASTING CO.

a division of HANSCO corp.
MYERSTOWN, PA. 17067

MATERIAL TEST REPORT

C
U
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T
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M
E
R

Atwood & Morrill

CUSTOMER ORDER NO.	PATTERN NO.	DATE
AM23083	16732-30266-603 ✓	2/20/81
SPECIFICATION	QUARTER DESIG.	
ASME SA216 Gr. WCC ✓	Q70-1	

CONTROL NO.		56402	
HEAT SERIAL		F9769-1 ✓	
RT. NO.		U2456 ✓	
CHEMICAL COMPOSITION			
C		.24 ✓	
Mn		.73 ✓	
Si		.12 ✓	
P		.006 ✓	
S		.005 ✓	
Cr			
Ni			
Mo			
Cu			
GULF STATES UTILITIES INC. RIVER BEND STN UNIT 1 P.O. 228, 218 062 J.D. 12210.50 Check Valves / 18" / 40V F0327 Alwood & Morrill Salem, MA			
MECHANICAL PROPERTIES			
T E N S I L E	TENSILE, Ksi	79.0 ✓	
	YIELD, Ksi	42.5 ✓	
	ELONG. %	29.0 ✓	
	RED. of AREA %	59.2 ✓	
	ENERGY, ft-lbf	53-53-50	
C H A R P Y	IAT. EXP. mils	48-46-44 ✓	
	SHEAR, %	40-40-50	
	TEST TEMP. °F	40 ✓	
Q U I T			
PIECES SHIPPED		1	



REPORT OF
CHEMICAL & PHYSICAL
ACCEPTED

BY isa (supp)
DATE MAR 25 1981

ATWOOD & F. ORRILL CO. INC.

On Life Insurance

WJL ANI
9-15-82

"I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT."

R. Campali 2/20/81
AUTHORIZED SIGNATURE

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



3-11-81
Level III

THIS

DAY OF

19

TRANSMITTAL NO. 01308

Enclosure 2 (cont'd.)

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8 of 10



QUAKER ALLOY CASTING CO.
a division of HARSCO corp.
MYERSTOWN, PA. 17067

Item 5.g
20" 900# DISC

13464-0411

NUCLEAR

CERTIFICATE OF ACCEPTANCE ON QUALITY EXAMINATION AND INSPECTION

CUSTOMER Atwood & Morrill Co. PURCHASE ORDER AM23083 CONTRACT N/A
PATTERN 16699-30545-408 DRAWING 30545-408-C Rev 0 DESCRIPTION disc SIZE 20"
MATERIAL SPECIFICATION ASME A216 Gr. WCC GRADE WCC Q. DESIGNATION Q70
HEAT F9574 CASTING SERIAL F9574-1 R.T./U.T. SERIAL U2270 SHOP ORDER 56405 JOB FILE J0806-01
NO. PIECES 1 SOURCE INSPECTION A & M QUALITY SYSTEM ASME Section III NA 3700
ASME B & PV CODE, 1974 EDITION, THRU 19 ADDENDA. NUCLEAR CLASS QARMN1

VERIFICATION AND CERTIFICATION

REQUIRED	EXAM./INSPECT	APPROVED PROCEDURES	SIGNATURE*	LEVEL*	DATE
<input checked="" type="checkbox"/> 100% (Max. Feasible Coverage) <input type="checkbox"/> PARTIAL <input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> RADIOGRAPHY <input type="checkbox"/> ULTRASONIC	<u>QAP-R-31-08</u>	<u>J. Kimmel</u> as	<u>III</u>	<u>11-4-80</u>
<input checked="" type="checkbox"/> 100% (Max. Feasible Coverage) <input type="checkbox"/> PARTIAL <input type="checkbox"/> PARTIAL (REPAIRS ONLY)	<input checked="" type="checkbox"/> MAG. PARTICLE <input checked="" type="checkbox"/> WET <input checked="" type="checkbox"/> DRY <input type="checkbox"/> PENETRANT**	<u>QAP-M-33-01</u>	<u>M. J. Imaschewitz</u> as	<u>II</u>	<u>12-5-80</u>
<input checked="" type="checkbox"/> GULF STATES UTILITIES INC. RIVER BEND STN UNIT 1 P.O. 228-218-062 J.O. 12210.50 Check Valves 1B21 A6V F03219 Atwood & Morrill Salem, MA	<input type="checkbox"/> VISUAL	<u>MSS-SP55</u>	<u>W. Wagner</u> as	<u>II</u>	<u>12-5-80</u>
<input checked="" type="checkbox"/>	<input type="checkbox"/> DIMENSIONAL	DWG # <u>30545-408-C Rev 0</u>	<u>T. Hengrich</u>		<u>12-5-80</u>
<input type="checkbox"/> RANGE	<input type="checkbox"/> BRINELL HARDNESS	<input type="checkbox"/> BHN.			

*QUALIFICATION RECORDS AS APPROPRIATE ACCORDING TO SNT-TC-1A, NAVSHIPS 250-1500-1 OR MIL-STD-271 ARE MAINTAINED AND ON FILE FOR REVIEW UPON REQUEST.
**ALL LIQUID PENETRANT MATERIALS USED MEET THE REQUIREMENTS OF APPLICABLE CODES. MATERIAL CERTIFICATES OF ANALYSIS ARE MAINTAINED AND ON FILE FOR REVIEW UPON REQUEST.

WE CERTIFY CORRECTNESS OF THE ABOVE INFORMATION
AND THAT THE MATERIAL LISTED IS ACCEPTABLE TO THE STATED REQUIREMENTS

FORM 113 REV 2, 5/79



Det. Soliday

Signed Det. Soliday
QUAKER ALLOY CASTING CO.

Date 12-15-80

Enclosure 2 (cont'd)

9 of 10

TRANSMITTAL NO. 01308

Item 5.g (cont'd.)
20'-900" DISC

13464-DIA



QUAKER ALLOY CASTING CO.
a division of HARSICO Corp.
PITTSBURGH, PA. 15207

MATERIAL
TEST
REPORT

CUSTOMER

Atwood & Morrill

CUSTOMER ORDER NO.	PATTERN NO.	DATE
AM23083	16699-30545-408	12/15/80
SPECIFICATION		QUAKER DESIGN
ASME SA216 Gr. WCC		Q70 -1

CONTROL NO.	56405		
HEAT SERIAL	P9574-1		
RT. NO.	112270		
CHEMICAL COMPOSITION			
C	.23	✓	
Mn	.70	✓	
Si	.45	✓	
P	.003	✓	
S	.003	✓	
Cr			
Ni			
Mo			
Cu			
MECHANICAL PROPERTIES			
TENSILE, KSI	76.5	✓	
YIELD, KSI	41.0	✓	
ELONG. %	28.5	✓	
RED. of AREA %	56.4	✓	
ENERGY, ft-lb	45-41-46		
LAT. EXP. mils	43-37-42		
SHEAR, %	40-40-40		
TEST TEMP.	+40	✓	
PIECES SHIPPED	1		

ADDITIONAL INFORMATION:



REPORT OF
CHEMICAL & PHYSICAL
ACCEPTED
BY Lisa Rippa
DATE 1/13/81
ATWOOD & MORRILL CO. INC.
Quality Assurance

Q70 ANI 9-15-82

"I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT."

R. Rippa
AUTHORIZED SIGNATURE

12-15-80

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

A&M
Q.C.B.
A
12-23-80
Leuchter

THIS

DAY OF

19

Enchance R (cont'd.)

43

TRANSMITTAL NO. 01308

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