



**Commonwealth Edison**

One First National Plaza, Chicago, Illinois  
Address Reply to: Post Office Box 767  
Chicago, Illinois 60690

August 4, 1981

Mr. A. Bournia  
Licensing Branch No. 2  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: LaSalle County Station Units 1 and 2  
Supplemental Information Regarding GDC-51  
NRC Docket Nos. 50-373/374

Reference (1): L. O. DelGeorge letter to A. Schwencer  
dated May 26, 1981

Dear Mr. Bournia:

In response to the informal request for confirmatory information made by Mr. J. Halipatz in a telephone conference of May 26, 1981, enclosed is supplemental information on the subject of GDC-51. This information supports the conclusions made by Mr. Halipatz relative to the information submitted in Reference (1) and, we believe, completes all outstanding commitments on this subject. The requested information is summarized below. Supporting documentation is enclosed for your use.

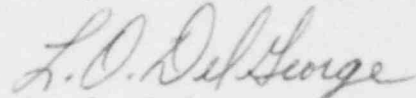
1. Material certification for Drywell Head Flange at its thickest section on piece 314-1. Thickness is 4 inches; certification is attached; heat treatment record provided; and charpy impact test results provided.
2. Thickness of maximum section in personnel hatch. The material is SA516 Grade 70; thickness 2 1/2 inches; summary sheet is provided.
3. Material Certification for main-steam flue-head at its maximum thickness. Thickness is 4 1/2 inches; certification for four flue-heads for each of two heats are attached, including mechanical properties charpy test data, and heat treatment.
4. Material Certification and disc thickness for main steam isolation valve B21F022A. Certs for eight valve discs provided, including the mechanical properties, charpy test and heat treatment. The calculated minimum dimension was 5 1/2 inches.

Boo!  
1/1

5. Feedwater valve B21F010A. The heat treatment for the disc material is recorded on the data sheet provided for heat no. F7728.
6. Feedwater valve B21F032A. The heat treatment Certificate No. 23879A from Oakland Metal Treating Company includes the requested data; the charpy test data is also included for this valve bonnet.

Two (2) copies of the referenced documentation are enclosed for your use. If you have any further questions in this regard, please direct them to this office.

Very truly yours,



L. O. DelGeorge

Director of Nuclear Licensing

Enclosures

cc: NRC Resident Inspector - LSCS (w/o enc.)

2371N



See Standard 607.3.7 for instructions  
for using this form.

MATERIAL HEAT NUMBER SHEET

- Material Types:
1. Welded Assemblies
  2. Non-Welded Code Matl.
  3. Non Code Matl.

Piece-Mark	Serial No.	Material Heat No.	Matl. Type	Piece-Mark	Serial No.	Material Heat No.	Matl. Type
314-1	1	801P11360-211713-1		BETH. STEEL		12-10-74	
314-1	2	801P21430-212015-1		PTH. STEEL		12-10-74	
314-1	3	801N10150-21159-1					
THICKEST							
ITEM # 1							
— L.O. DELGEORGE							
CTR. 5/26/81							

Data taken from applicable GBI records:

CBI Shop QA *[Signature]*

Date 2/19/25

REVISIONS  
By  
Chkd  
Date

Reviewed (for material checked by code):

Authorized Inspector *[Signature]*

Date 5-11-75

Contract No.

73-6336

No. 314

Sheet 3

DEC 19 1954

```

46400      75200 2 28 OK
XXXXXXXXXXXXXXXXXXXX
51400      76200 2 30 OK

```

I certify the above results to be correct as contained in the records of the Bethlehem Steel Corporation, C. W. Roe Per A. H. Hahn

RECORD OF HEAT TREATMENT

CUSTOMER: Chicago Bridge & Iron Company

PAGE 4 ATTACHMENT  
SHIPMENT NO. 803-20076  
DATE SHIPPED 10/3/74

DEC 10 1974

SERIAL NO.	HEAT NUMBER	HARDENING CYCLE		TEMPERING CYCLE			STRESS RELIEVING CYCLE				
		FURNACE, TEMP °F	TIME (MIN)	QUENCHING (TYPE)	FURNACE TEMP °F	TIME (MIN)	COOLING	RATE OF HEATING °F/HR	HOLDING TEMP °F	TIME (MIN)	RATE OF COOLING °F/HR
P 11713(1)	801P11360	1655/1705	230	WATER	1230	280	AIR COOL	80/100	1125	480	40/120

PLATES AND TEST SPECIMENS QUENCHED AND TEMPERED PER PROCEDURE PM301.  
TEST SPECIMENS NOT REMOVED UNTIL AFTER PLATE TEMPERED.  
TEST COUPONS REMOVED FROM QUENCHED AND TEMPERED PLATE PWHT PER PROCEDURE PM501A.

BEK

DEC 10 1974

IMPACT PROPERTIES

CUSTOMER: CHICAGO BRIDGE & IRON CO.

PAGE 4 ATTACHMENT  
SHIPMENT NO. 803-20076  
DATE SHIPPED 10/3/74

LONGITUDINAL CHARPY V-NOTCH TESTED @ -30 OF

<u>SERIAL NUMBER</u>	<u>EAT NUMBER</u>	<u>CHARPY SIZE</u>	<u>FT. LBS.</u>	<u>% DUCTILE FRACTURE AREA</u>	<u>LATERAL EXPANSION (IN)</u>
P 11713(1)	801P11360	FULL	98-96-85	76-84-72	.071-.070-.068



## METAL MATERIAL VERIFICATION SUMMARY SHEET

Contract No. 15-6220  
Sheet 6 of 7

No. of Ctrs For Customer/

Conv to Engineering - Uv \_\_\_\_\_ Date \_\_\_\_\_

Copy to Engineering - UV	Date	ORDER NO.	SUPPLIER'S IDENTIFICATION	SUPPLIER'S SLAB NUMBER	MATERIAL SPEC. AND THICKNESS FOR PLATES	CAR OR TRUCK NUMBER AND SUPPLIER	CTR CHECKED DATE AND INITIAL	METAL REC'G INSPECTION REPORT CHECKED DATE AND INITIAL	DAILY FABR OR STORES RELEASE REPORT CHECKED DATE AND INITIAL	ENGR. PIECE MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	CHECKED COMPLETE INITIAL	REMARKS
4- FEB	1951	10509-1	AS 16-70	MS 690	T = 3/4"	Roll	(404336)	3/15	141-5	1	8	58	UM	
10 FEB	1951	10509-1	AS 16-70	MS 690	T = 1/2"	Roll	(404334)	3/19	141-5	1	1	58	UM	



ITEM #3

L.O. DELGEORGE

LTR. 5/26/81

ITEM 2

DETAIL TYPE 4A

4 FLUED HEADS, HEAT NO. 16634

4 FLUED HEADS, HEAT NO. 9483

STOCK NO. 577-000-91-0001

B. F. SHAW PURCHASE ORDER NO.

L-5754

QUALITY CONTROL  
REVIEW FOR  
LA SALLE COUNTY STATION UNITS 1 & 2  
COMMONWEALTH EDISON COMPANY  
SARGENT & LUNDY  
ENGINEERS

- 1 ☒ REVIEWED & ACCEPTED
- 2 ☐ IF REVISIONS ARE REQUIRED, CONTRACTOR CAN  
PROCEED BASED ON MAKING REVISIONS. IF NOT.
- 3 ☐ REVISIONS ARE NOTED AND RESUBMIT  
HOLD FABRICATION
- 4 ☐ RESULTS DO NOT MEET SPECIFICATION  
REQUIREMENTS

ANY ACTION SHOWN ABOVE IS SUBJECT TO TERMS OF THE CONTRACT.  
AND DOES NOT RELIEVE CONTRACTOR FROM HIS OBLIGATIONS UNDER THE  
CONTRACT, INCLUDING DESIGN AND DETAILING.

FOR Flued Heads  
EQUIPMENT NO. L-5754-1 BENJAMIN F. SHAW CO.  
BY N DATE 10-15- CMTR NO. L-5754-1  
PAGE 15 OF 39





SEATTLE, WASHINGTON 98124

TUBE TURNS  
DIVISION OF CHEMETRON  
P O BOX 987  
LOUISVILLE, KY 40201

Date 10-29-75  
Customer's Order No. 03777  
Our Invoice No. 6153 FS  
Contract No.

CUSTOMER

HEAT NO.	MATERIAL	DESCRIPTION	SOURCE
16634	LF-1 MOD	4 PENETRATION HEADS PER DWG 79736-A2.0 REV 4 TYPE 4A STOCK #577-000-91-0001	SA-350 LF-1 MOD BY CODE CASE 1332-6 & TT COMPONENTS SPEC CS-F-10 SEE REMARKS
		S/N 1, 2, 3, and 4	

## CHEMICAL ANALYSIS

HEAT NO.	MATERIAL	C	MN	P	S	SI	Ni	CR	MO	V	CU	BN		G/S
16634	LF-1 MOD	.25	1.20	.020	.025	.19								

HARDENABILITY - ROCKWELL "C" IN 1 1/4" OF AN INCH

[illegible]

## MECHANICAL PROPERTIES

TEST NO.	HEAT NO.	MATERIAL	YIELD 100,000 IN.	TENSILE 100,000 IN.	ELONG. 2 IN.	RED. OF AREA	FRACTURE	BEND	MICRO	IMPACT
S/N 1-T	16634	LF-1 MOD	58,000	81,000	30.5	59.6	CUP			SEE APPENDIX
S/N 2-T	16634	LF-1 MOD	56,000	81,500	32.0	64.2	CUP			
S/N 3-T	16634	LF-1 MOD	56,500	80,000	33.0	64.4	CUP			
S/N 4-T	16634	LF-1 MOD	60,000	82,500	30.0	59.1	CUP			

REMARKS: SPECS CONT'D: TENSILE PROPERTIES TO CONFORM TO SA-350-LF-1 -  
CHURPY V-NOTCH SPEC IN ACCORDANCE WITH SA-370.

QUENCHED 1600°F - .18 HOURS ✓  
TEMPERED 1325°F - .26 HOURS

BENJAMIN F. SHAW CO.  
EMTR NO. 4-57542  
PAGE 16 OF 32



U.S. AIR FORCE AND SWORN TO BEFORE ME

FILED \_\_\_\_\_ DAY OF \_\_\_\_\_ 19\_\_\_\_

WE CERTIFY THAT THE MATERIAL COVERED BY THIS REPORT HAS BEEN INSPECTED & TESTED IN ACCORDANCE WITH AFR-DEPT/DAUR REQUIREMENTS DESCRIBED HEREIN, AND THAT INSPECTED AND ON FILE SUBJECT TO EXAMINATION

KARLE M. JORGENSEN CO.

89

EARLE M. JORGENSEN CO.

B. F. SHAW CO.

Stock No. 577-006-91-00  
B F Shaw P O No. L-5754

Appendix 1

QC G-32-05-01 CTEM-2

Effective 3/25/76 TYPE 4

IMPACT TEST REPORT

Customer TUBE TURNS

Purchase Order 03777

Specification SA-370

Contract Number

Laboratory Performing Testing EARLE M JORGENSEN CO

Lab Number 6153 FS

Testing Machine (Type, Model) RIEMLE R 71684

Calibration Date 8-1-75

SPECIMEN:

Heat Treatment STRESS RELIEVED AT 1175°F FOR 8 HOURS

Orientation & Location TANGENTIAL - 1" BELOW SURFACE

Notch Orientation PERPENDICULAR TO SURFACE

Type CHARPY V-NOTCH ✓

No in Set 3

RESULTS:

Specimen Identification

Test Temp, °F

Impact Values  
Et-lbs

Lateral  
Expansion

% Ductile  
Fracture

Min Requirements

+40°F

INFO ONLY

25 mils

INFO ONLY

S/N 1-T

+40°F

36' ✓

.035

45%

+40°F

35' ✓

.033

40%

+40°F

40' ✓

.038

50%

S/N 2-T

+40°F

30' ✓

.027

25%

+40°F

34' ✓

.032

35%

+40°F

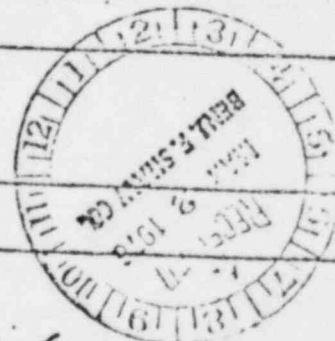
32' ✓

.030

30%

REMARKS:

BENJAMIN F. SHAW CO.  
CMTR NO. L-5754-1  
PAGE 17 OF 39



EARLE M. JORGENSEN CO.

IMPACT TEST REPORT

Appendix I

QC G-32-05-01

Effective 3/25/74

Stock No. 577-000-91-00  
B F Shaw P O No. L-5754

Customer TUBE TURNS

Purchase Order 03777

Specification SA-370

Contract Number

Laboratory Performing Testing EARLE M JORGENSEN CO

Lab Number 6153 FS

Testing Machine (Type, Model) RIENLE R 71684

Calibration Date 8-1-75

SPECIMEN:

Heat Treatment STRESS RELIEVED AT 1175°F FOR 8 HOURS.

Orientation & Location TANGENTIAL - 1" BELOW SURFACE.

Notch Orientation PERPENDICULAR TO SURFACE.

Type CHARPY V-NOTCH

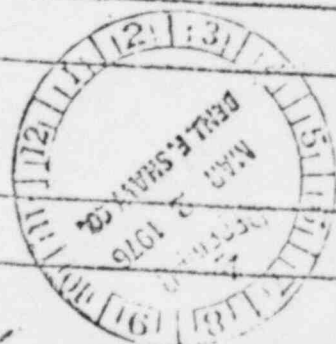
No in Set 3

RESULTS:

Specimen Identification	Test Temp, °F	Impact Values ft-lbs	Lateral Expansion	% Ductile Fracture
	Min Requirements			
S/N 3-T	+40°F	INFO ONLY	25 mils	INFO ONLY
	+40°F	33#	.031	35%
	+40°F	33#	.032	35%
	+40°F	37#	.035	45%
S/N 4-T	+40°F	31#	.030	35%
	+40°F	37#	.033	45%
	+40°F	32#	.031	35%

REMARKS:

BENJAMIN F. SHAW CO.  
CMTR NO. L-5754-1  
PAGE 18 OF 39







FORGE DIVISION  
8531 E. MARGARET WAY SOUTH - P.O. BOX 704 (1000)  
MAKING ADDRESS P.O. BOX 704  
SEATTLE, WASHINGTON 98144

TUBE TURNS  
DIV OF CHEMETRON  
P O BOX 987  
LOUISVILLE, KY 40201

Date 12-8-75  
Customer's Order No. 93777  
Drawing No. 6189 IS  
Contract No.

ATTN: MR E A ANDERSON

HEAT NO.	MATERIAL	REMARKS	SPEC.
9483	LF-1	4 PENETRATION HEADS PER FIG 20725-A2.0, PER 4, TIE 4A UNIT 2, STOCK #577-000-01-0001	SA 350- LF-1 MOD BY CODE CASE 1332-6 & TT COMPONE SPEC CS-F-105 MAX BHN 187

HEAT NO.	MATERIAL	C	MN	P	S	SI	CR	MO	V	CU	SH	OTHER	GTS
9483	LF-1	.24	1.17	.007	.023	.22							

HARDENABILITY - PORTLAND "C" IRON CASTING																													
NO.	MATERIAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
													</																

TEST NO.	HEAT NO.	MATERIAL	YIELD (50% TENSILE)	TENSILE (50% TENSILE)	ELONGATION (INCHES)	REDUCTION OF AREA (%)	CHARPY V-NOTCH IMPACT	BRINELL	MACRO	IMPACT
N 1-T	9483	LF-1	60,000	80,000	27.3	64.9	CHP			
N 2-T	9483	LF-1	65,000	85,000	29.0	58.1	CHP			
N 3-T	9483	LF-1	62,500	84,000	29.0	58.6	CHP			
N 4-T	9483	LF-1	65,500	85,000	28.5	57.3	CHP			

MARKS: SPECS CONT'D: TENSILE PROPERTIES TO CONFORM TO SA-350 LF-1. CHARPY V-NOTCH SPECIMENS IN ACCORDANCE WITH SA-370, TRANSVERSE TO AXIS OF FORGING WITH NOTCH PERPENDICULAR TO SURFACE.

HEATED 1600°F - 16 HOURS  
PERFECTED 1250°F - 22 HOURS

BENJAMIN F. SHAW CO  
CMT NO. 1-5757-1  
PAGE 20 OF 32

TESTED AND SWORN TO BEFORE ME  
DAY OF \_\_\_\_\_ 19\_\_\_\_  
NOTARY PUBLIC - SEATTLE

WE CERTIFY THAT THE MATERIAL CONTROLLED BY THIS REPORT HAS BEEN INSPECTED & TESTED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS DESCRIBED HEREIN AND TEST REPORTS ARE ON FILE SUBJECT TO EXAMINATION

THOMAS H. JOHNSON  
12-8-75

EARLE M. JORGENSEN (C),

Appendix I  
QC C-32-05-01  
Effective 3/25/74

IMPACT TEST REPORT

Customer TUBE TURNS Purchase Order 03777  
Specification SA-370 Contract Number \_\_\_\_\_  
Laboratory Performing Testing EARLE M. JORGENSEN, INC. Lab Number 5189 FS  
Testing Machine (Type, Model) RIEMER R 21684 Calibration Date 8-1-75  
SPECIMEN:  
Heat Treatment STRESS RELIEVED AT 1175 °F TO 6 HOURS.  
Orientation & Location TANGENTIAL TO SURFACE.  
Notch Orientation PERPENDICULAR TO SURFACE.  
Type CHARPY V-NOUGH No in Set 3

RESULTS:

Specimen Identification	Temp. °F	Impact Values ft-lbs	Lateral Expansion	% Ductile Fracture
Min Requirements	140 °F	100 ft-lbs	75 mils	INEL ONLY
S/N 1-T	140 °F	57 ft-lbs ✓	.053	70%
1-T	140 °F	62 ft-lbs ✓	.055	75%
1-T	140 °F	65 ft-lbs ✓	.056	75%
S/N 2-T	140 °F	45 ft-lbs ✓	.047	45%
2-T	140 °F	44 ft-lbs ✓	.050	40%
2-T	140 °F	40 ft-lbs ✓	.038	40%

REMARKS:

BENJAMIN F. SHAW CO.  
CMTR NO. L-5784-1  
PAGE 21 OF 32



## IMPACT TEST REPORT

Power TUBE TURNS Purchase Order 03777  
 Specification SA-370 Contract Number \_\_\_\_\_  
 Laboratory Performing Testing EARLE M. JORGENSEN CO. Lab Number 6189 15  
 Testing Machine (Type, Model) RIENLE R 71684 Calibration Date 8-1-75

## SPECIMEN:

Heat Treatment STRESS RELIEVED AT 1175°F FOR 8 HOURS.Orientation & Location TANGENTIAL - 1" BELOW SURFACE.Notch Orientation PERPENDICULAR TO SURFACE.Type CHARPY V-NOTCHNo in Set 3

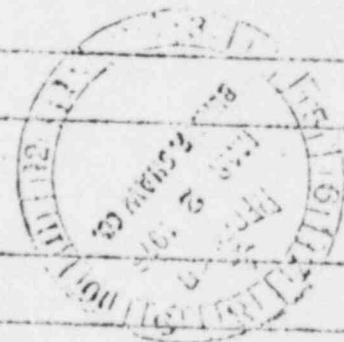
## RESULTS:

Specimen Identification	Test Temp, °F	Impact Values ft-lbs	Lateral Expansion	% Ductile Fracture
Min Requirements	+40°F	INFO ONLY	25 mils	INFO ONLY
S/N 3-T	+40°F	42#	.039	50%
3-T	+40°F	44#	.043	60%
3-T	+40°F	52#	.047	65%
S/N 4-T	+40°F	40#	.036	40%
4-T	+40°F	41#	.039	40%
4-T	+40°F	39#	.036	40%

## MARKS:

BENJAMIN F. SHAW CO.  
 CMTR NO. L-5754-1  
 PAGE 23 OF 39

*Bob Korman*





# EARLE M. JORGENSEN CO.

ITEM NO. 2  
Level Type 4A  
Stock No. 577-000-91  
B F Shaw P O No. L-57

## FORGE DIVISION

8531 E. MARSHAL WAY SOUTH • PHOENIX 762-3100 (AREA 209)  
MAILING ADDRESS: P. O. BOX 21076  
SEATTLE, WASHINGTON 98124

TUBE TURNS  
DIV OF CHEMETRON  
P O BOX 937  
LOUISVILLE, KY 40201

Date 2-18-76  
Customer's Order No. 03777  
Our Invoice No. 6189 FS

MANUFACTURER: EARLE M JORGENSEN CO

MATERIAL LF-1 MOD  
SPEC. G32-04-05, REV 3

DESCRIPTION OF ITEMS:

HEAT NO.

4 PENETRATION HEADS PER DWG 79736-A2.0, REV 4, TYPE 4A  
UNIT 2, STOCK #577-000-91-0001

9483 ✓

OPERATOR AL SCHLUNK  
LEVEL

EQUIPMENT: UM 715

ITEM	FREQUENCY	SEARCH UNIT	PULSE LENGTH VIDEO-IF	REJECT (ZERO SUPPRESS)	SURFACE COND.	COUPLANT
ALL	2.25 MHZ	1" ACCUSCAN	MIN	OFF	MACHINED	ECHO GEL

REFERENCE SIDS. & METHODS: FIRST BACK REFLECTION SET TO 75% SCREEN HEIGHT. CONTACT.

RESULTS OF INSPECTION — COMMENTS: ACCEPTABLE PER G32-04-05, REV 3.

TYPE OF INSPECTION: MAGNETIC PARTICLE ✓

SPEC. G32-04-04

TEST CONDITIONS: SURFACE MACHINED. WET CONTINUOUS METHOD WITH  
BLACK PARTICLES. CLAMPS 5,000 AMPS (2) 90°  
HEAD SHOTS. CRQ 14 EQUIPMENT.

DESCRIPTION OF DEFECTS FOUND ( ANY: ACCEPTABLE PER G32-04-04.

OPERATOR AL GEORGE  
LEVEL

BENJAMIN F. SHAW CO.  
CMTR NO. L-5754-1  
PAGE 23 OF 39

INSPECTED BY:

WE CERTIFY THE ABOVE TO BE IN ACCORDANCE WITH THE  
RECORDS CONTAINED IN OUR FILES

EARLE M. JORGENSEN CO.

BY

*Boo Newen*



NOTARY PUBLIC — SEATTLE

DAY OF 19

DEPOSED AND SWORN TO BEFORE ME

NOTARY PUBLIC — SEATTLE

# GULF FORGE COMPANY

8881 HEMPSTEAD HWY. P. O. BOX 2926 713-869-3643  
HOUSTON, TEXAS 77001

36-54291

CUSTOMER'S ORDER No.

36-54334 #1

DATE

3-15-73

JOB ORDER No.

69539

SOLD TO

ROCKWELL MFG. CO.  
1900 South Saunders St.  
Raleigh, NC 27603

SHIPPED TO

DITTO



QUANTITY

DESCRIPTION

5

MACH DISC PER DWG A-181102  
24.12"OD x 10.62"LG.

(ASME SA182 F-11) RMC-02271 REV 1

Item #4

L.O. DeGeorge  
GR. 5/26/81

1B21-F022A

CP Bartow 3-15-73

REVIEWED BY:

DATE

Quality Control Representative

General Electric Co. - Atomic Power Equip. Dept.

CHEMICAL ANALYSIS

21.6851	SHARON	.13	.51	.010	.010	.70	1.15	.51

PHYSICAL PROPERTIES

52,000	84,000	29.0	56.0	184
46,700	79,000	31.0	63.0	179
48,000	82,000	31.0	61.0	184
48,500	73,700	31.5	62.0	174
44,000	80,000	27.5	55.0	179

HEAT TREATMENT

Preheat	600	12 hours
Temper	1250	12 hours

DESCRIBED AND SWORN TO BEFORE ME  
SS#464-82-7815

I CERTIFY THAT THIS IS A TRUE COPY OF ORIGINAL AND THAT IT IS A TRUE COPY OF THE FILE AT THE OFFICE OF GULF FORGE CO. AND THAT THIS STEEL WAS MANUFACTURED AND FORGED IN THE UNITED STATES OF AMERICA

THIS 15th DAY OF MARCH 1973

Robert P. Boetting  
NOTARY PUBLIC

BY

Sam J. Proulx

# GULF FORGE COMPANY

8881 HEMPSTEAD HWY. P. O. BOX 2926 713-869-3643  
HOUSTON, TEXAS 77001

CUSTOMER'S ORDER No.

36-54334 #1

DATE

3-15-73

JOB ORDER No.

69539

SOLD  
TO

ROCKWELL MANUFACTURING

SHIPPED  
TO



QUANTITY

DESCRIPTION

3

MACH DISC PER DWG A-131102  
24.12"OD x 10.62"LG.

(ASME SA182 F-11) RMC-02271 REV 1

*1B21-1022A*

*CP Bartm 3-15-73*

REVIEWED BY:

DATE

Quality Control Representative

General Electric Co. - Atomic Power Equip. Dept.

## CHEMICAL ANALYSIS

0861 ✓	SHARON	.13	.51	.010	.010	.70	1.15	.51				

## PHYSICAL PROPERTIES

46,500 ✓	73,000 ✓	30.0 ✓	62.0 ✓	174 ✓					
47,000 ✓	72,000 ✓	30.0 ✓	60.5 ✓	179 ✓					
46,000 ✓	70,000 ✓	31.0 ✓	50.0 ✓	179 ✓					

## HEAT TREATMENT

Normalise	1600	12 hours		
Temper	1250	12 hours		

QUALITY CONTROL  
APPROVED

*6-14-73*  
*JAB*

SHIPPED AND SWORN TO BEFORE ME  
SS#464-82-7815

15th DAY OF MARCH 1973

*Robert P. Cooper*  
NOTARY PUBLIC

BY

*Sam S. Perault*

THIS IS A TRUE COPY OF ORIGINAL TEST SHEET, NOW ON  
FILE IN THE OFFICE OF GULF FORGE CO. AND THAT THIS STEEL WAS MAN-  
UFACTURED AND FORGED IN THE UNITED STATES OF AMERICA.



Flow Control Division  
Rockwell International

1900 S. Saunders Street  
Raleigh, North Carolina 27603  
(919) 832-0525

Customer GMRL ELECTRC

Customer Order no. AD-12

DWG. NO. PD-423744 SIZE/FIG. NO. 26" 1612 GMMNTY

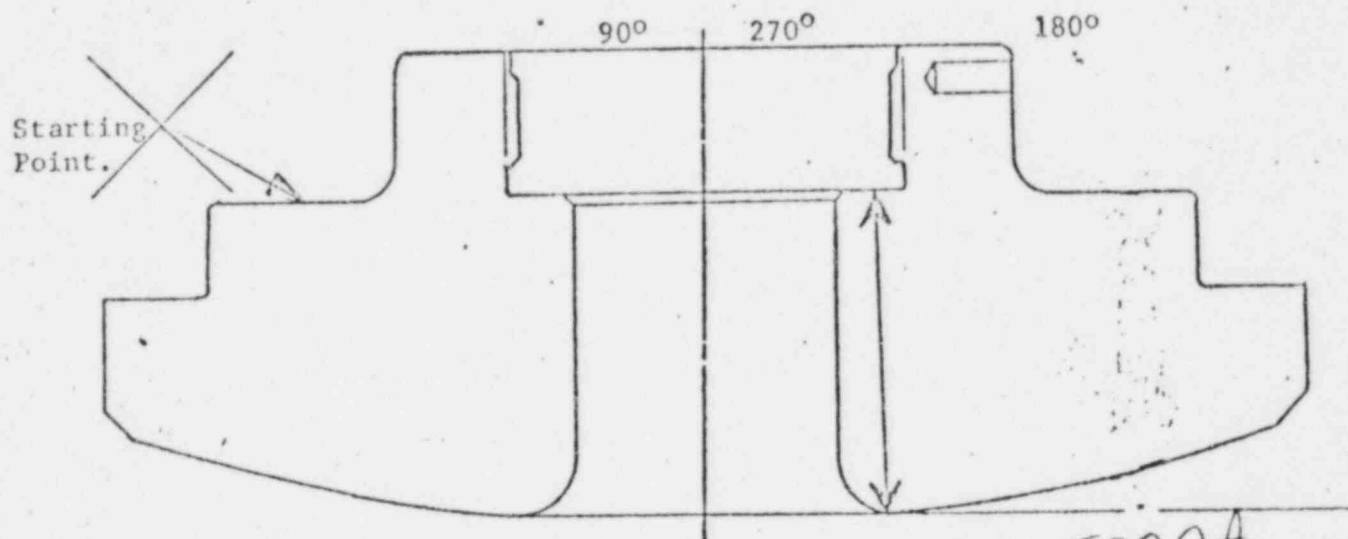
SEI 408 Re-5 MATERIAL 02271 HEAT NO. 210861-37

DISK CONDITION:

ROUGH ☐

ROUGH MACHINED ☐

FINISHED MACHINED ☒



1B21-F022A

Calculated minimum 5.50

Dimensions Checked By C. H. Smith

Date 4-11-74

Customer Q.C. Rep. [Signature]

Date 4/11/74

ASME Code Inspector G. D. Blumer

Date 4/11/74

X	6.64
90°	6.64
180°	6.64
270°	6.64

Method of Measurement: Transfer Calipers ☐  
Dial Calipers

Stamp X on part as starting point.

UT ☐

depth scale ☒

Method per. SOI# 40-12-05 Rev-0

Item #5

1B21FO10A

## QUAKER ALLOY CASTING CO., MYERSTOWN, PA.

CUSTOMER Anchor/Darling PURCHASE ORDER L690 CONTRACT NO. \_\_\_\_\_

SHOP ORDER D414-02 DESIGNATION Q50 PATTERN NO. D8226

MATERIAL SPEC. & GRADE ASME SA352 GR.LCB DESCRIPTION disc SIZE 24"

HEAT NO. F7728 CASTING SERIAL NO. F7728-7 R.T. SERIAL NO. P715

NUCLEAR CLASS 1 PCS. COVERED ON THIS REPORT 1 SOURCE INSPECTION \_\_\_\_\_

## HEAT TREATMENT RECORD

PROCESS*	<u>N</u>	<u>Harden</u>	<u>Temper</u>
PROCEDURE	<u>Rev 0</u> <u>Q&amp;P-HT(P-120)-1</u>	<u>Same</u>	<u>Same</u>
DATE	<u>11-18-75</u>	<u>1-12-76</u>	<u>1-13-76</u>
FURNACE	<u>Lynn + Drefinn</u>	<u>Lynn + Drefinn</u>	<u>Gas Machine</u>
CHARGE NO.	<u>FD-1172</u>	<u>FD-1225</u>	<u>Qm-1678</u>
CHARGE TEMP.	<u>130°F</u>	<u>165°F</u>	<u>165°F</u>
TIME TO EQUIL. TEMP.	<u>4 Hrs</u>	<u>2 Hrs 15 min</u>	<u>25 min</u>
HOLDING TEMP. (RANGE)	<u>1690°-1710°F</u>	<u>1630°-1640°F</u>	<u>1200°F</u>
TIME AT TEMP.	<u>6 Hrs 30 min</u>	<u>6 Hrs 30 min</u>	<u>6 Hrs</u>
COOLING DATA	<u>Air</u>	<u>*</u>	<u>Air</u>
REMARKS	<u>*Furnace Cool 1440°-1450°F 1 Hr 10 min.</u> <u>Furnace Cool 1420°-1430°F 45 min</u> <u>water Quench</u>		

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

J. Miller

Quaker Alloy Casting Company

TITLE

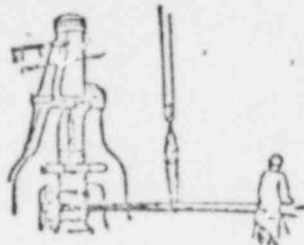
O.C. Pipe

DATE

6-30-76



Item #6



TEST REPORT  
WESTERN FORGE & TOOL WORKS  
Quality Forgings

Telephone 835-3220  
209 JEFFERSON ST. • OAKLAND, CALIFORNIA

1B21-F032A  
J-2939  
Mailing Address  
P.O. Box 1649  
OAKLAND, CALIFORNIA 94604  
Bonnet

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Anchor/Darling Valve Company  
24747 Clawiter Road  
Hayward, CA 94545

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CUSTOMER ORDER NO.	QUANTITY	ORDER DATE	INVOICE DATE	INVOICE NO.									
6918	4	6/14/77	7/7/77	5498									
DESCRIPTION & SPECIFICATION			SIZE										
SA 105 Bonnet Forgings No. 6530-2-5-2			Rough machined + 1/8" envelope typical MARK: 5660-01, S/N 1,2,3,4										
CHEMICAL ANALYSIS													
HEAT NO.	C	MN	PHOS	SUL	SIL	NI	CR	CU	MO	CO			G/S
89796	.34	.77	.013	.026	.27								
MECHANICAL TESTING													
	YIELD THOUSAND LBS/SQ. IN	TENSILE STRENGTH THOUSAND LBS/SQ. IN	ELONG % IN 2 IN	RED OF AREA %	BHN	ROCK WELL	B E N D	E M B	M A C R O	M I C R O	D E C A R B		
	60,600	87,700	31%	59.6%	163								
HARDENABILITY													
1	4	6	8	10	12	14	16	18	20	22	24	32	
Oakland Metal Treating Company, Certification No. 23879A, attached Material Marked with Mark No, S/N and Heat No., Low stress metal stamp													

We hereby certify that the above to be in accordance with the records maintained in our files.

We hereby certify that this material meets all requirements of the material specifications and all the applicable special requirements of Article NC 2000 of the ASME Section III, that are required to be fulfilled by the materials manufacturer.

WESTERN FORGE & TOOL WORKS  
Debbie Weber  
Debbie Weber

Bonnet

## LABORATORY CERTIFICATE

MASTER

## SIGNET TESTING LABORATORIES, INC.

TESTING AND INSPECTION OF CONSTRUCTIONAL AND INDUSTRIAL MATERIALS

ENGINEERS  
CHEMISTS  
METALLURGISTS

September 2, 1977

## REPLY TO

1425 WEST WINTON AVENUE  
HAYWARD, CALIFORNIA 94545  
702-7315 AREA CODE 415

LAB NO.: 26705

P.O. 3985  
500 5000-01

SAMPLE: Steel Forging, SA105; ASME Class 1, Winter '74

HEAT NO.: 89796

DATE RECEIVED: August 31, 1977

REPORT TO: Anchor/Darling Valve Co.  
24747 Clawiter Road  
Hayward, Ca. 94545

Attn.: John Smith, Jr.

1 B21-F032A  
BONNET  
J-2939REPORTCHARPY IMPACT TESTS

Specimen Size: 10x10x55mm

Notch: V-Notch

Test Temperature: +40°F

Test No.	Impact Value ft.-lbs.	Lateral Expansion inches	Percent Shear
1	45.1	0.047	40
2	39.5	0.040	40
3	38.1	0.042	40
Average:	40.9	0.043	40



Respectfully submitted,

SIGNET TESTING LABORATORIES, INC.

By

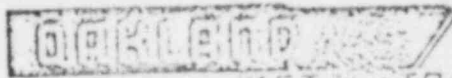
2cc: A/D Valve  
dvd

Bonnet



1 B21-F032

# Certification of Heat Treatment



METAL TREATING CO.

QUALITY CUSTOM HEAT TREATING

450 DERBY AVENUE

261-5675

OAKLAND, CALIFORNIA 94601

Date June 23, 1977 Certification No. 23379 A

Customer WESTERN FORGE & TOOL WORKS

Customer's Order No. 5830 Contract No. \_\_\_\_\_

Our Shipper No. 53879 Military Specification No. \_\_\_\_\_

No. Parts 5 Part Name and No. forgings

Specification, Material Used 1034 SA 105 Heat No. 89796

Specification, Heat Treating Heat treat to Condition SA-105

Annealed \_\_\_\_\_ \*F \_\_\_\_\_ Cooled in furnace to \_\_\_\_\_ \*F \_\_\_\_\_

Normalized \_\_\_\_\_ \*F \_\_\_\_\_ Time at heat \_\_\_\_\_

Carburize \_\_\_\_\_ \*F \_\_\_\_\_

Hardened \_\_\_\_\_ \*F \_\_\_\_\_ Time \_\_\_\_\_ Coolant \_\_\_\_\_

Drawn \_\_\_\_\_ \*F \_\_\_\_\_ Time at heat \_\_\_\_\_

Hardness Test 163 BHN No. of pcs. Tested 1

Stress Relieve \_\_\_\_\_ \*F \_\_\_\_\_

Solution Quench \_\_\_\_\_ \*F \_\_\_\_\_ Time \_\_\_\_\_

Age Harden \_\_\_\_\_ \*F \_\_\_\_\_ Time \_\_\_\_\_

NOTES HT 89796 → SH 21, 22, 3, 4  
TAG: 5660-01 1310 5866-02

We certify that heat treatment described above is true and correct and that temperatures and test results were obtained with standard approved methods.

OAKLAND METAL TREATING

By Richard H. Nelson  
Richard H. Nelson, Quality Controller

Bonnet