



**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.

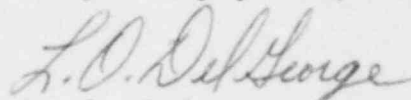
8108070127 810804  
PDR ADOCK 05000373  
A PDR

Boo!  
s  
//

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



Material Types:

- 1. Welded Assemblies
- 2. Non-Welded Code Matl.
- 3. Non Code Matl.

See Standard 607.3.7 for instructions for using this form.

### MATERIAL HEAT NUMBER SHEET

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	801P21430-112015-1		BETH. STEEL		12-10-74	
314-1	3	801N10150-11159-1					

**THICKEST**

ITEM # 1

L.O. DEUGERGE LTR. 5/26/81

Data taken from applicable CBI records

CBI Shop QA [Signature] Date 2/19/75

Reviewed for material covered by code [Signature] Date 5-11-75

REVISIONS

By  
Chkd  
Date

[Signature]

Contract No. 73-6336

No. 319

SI 3

BETHLEHEM STEEL CORPORATION  
METALLURGICAL DEPARTMENT  
REPORT OF TESTS AND ANALYSIS

13-0-20  
BEK

PLANT HARRIS HARBOR	SHIPMENT NO. H03-20074	DATE SHIPPED 10-03-74	CAR OR VEHICLE NO. CSS 100 CSS CLEARA KCS 000507	PAGE 1
------------------------	---------------------------	--------------------------	---	-----------

CHICAGO BRIDGE & IRON CO  
POY 774  
KANKAKEE IL 60101

SHIP TO  
CHICAGO BRIDGE & IRON CO  
TRACK #A1  
INDIAN OAKS IL

REC 10 1974

DESCRIPTION & SPECIFICATION CUSTOMER ORDER NO. BSCD ORDER NO.	SERIAL NUMBER	HEAT NUMBER	SIZE & QUANTITY				YIELD STRENGTH	TENSILE STRENGTH	ELONG. IN. %	BEND	HARDNESS	
			No. Pcs.	Thickness	Width or Dia.	Length					Weight	Type

PLATE - 1/2" - 20" x 70" - REV 1 & QAS-243 REV 0 ASME SA316 GR 70 PVO C ASME SECT 7 WINTER  
75 ADD LOW CHAPPY V NOTCH OF 20 FT LB AT MINUS 30 DEG F PER N2300 WITH  
ECCS MFG

46400 75200 2 28 OK  
51400 76200 2 30 OK

**QUALITY CONTROL  
REVIEW FOR**

PROJECT DESCR: Valve

CLIENT: SARGENT & LUNDY ENGINEERS

1.  Accepted

2.  Rejection (WHILE CONTRACTOR CAN REQUEST REWORK)

4.  Retest

FOR: Welding Dept

EQUIPMENT NO: 2-07

BY: [Signature] DATE: 2-07

SPEC NO: 2524 REQ NO: 2007

PLATES QUENCHED AND TEMPERED AND STAMPED MT

We certify that the requirements of the specification numbers shown hereon have been met.

HEAT NUMBER	C	Mn	P	S	Si
01P11560	.007	.017	.004	.030	.2

CHEMICAL ANALYSIS					
C	Mn	Cr	Mo	V	Ti

SUBSCRIBED AND SWORN TO BEFORE ME  
THIS 18 DAY OF Oct 1974  
Jerry Curtis Weston  
MY COMMISSION EXPIRES MAY 24 1975

RECORD OF HEAT TREATMENT

DEC

CUSTOMER: Chicago Bridge & Iron Company

DEC 10 1974

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

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

DLC 10187

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. 73-6336  
 Sheet 6 of 7

Copy to Engineering - by \_\_\_\_\_ Date \_\_\_\_\_  
 No. of Ctrs For Customer \_\_\_\_\_

ORDER ITEM NO.	SUPPLIER'S IDENTIFICATION NUMBER	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. MARK	SERIAL NUMBER	NO. OF PIECES FABRICATED	CHECKED COMPLETE INITIAL	REMARKS
7- PLE	K10509-1	AS16-70	SAE16-70 (MS) T-2 1/2	MS-70	5/15/70	5/15/70	5/15/70	141-5	1	8	58	UM
7- PLE	K10509-1	AS16-70	T-2 1/2	MS-70	5/15/70	5/15/70	5/15/70	141-5	1	4	58	UM
7- PLE	K10509-1	AS16-70	T-2 1/2	MS-70	5/15/70	5/15/70	5/15/70	141-5	1	4	58	UM
7- PLE	K10509-1	AS16-70	T-2 1/2	MS-70	5/15/70	5/15/70	5/15/70	141-5	1	4	58	UM

MATERIAL THICKNESS 2 1/2"

Item #2 = L.O. DEGEORGE LTR. 5/24/71



ITEM # 3  
L.O. DEGEORGE  
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 NOT ACCEPTED AND REVISIONS CONTRACTOR CAN  
IMPROVE BASED ON MAKING REVISIONS NEEDED.
- 3  REVISIONS 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





FORGE DIVISION  
 6331 E. MARGINAL WAY SOUTH - PHONE 762-1100 (AREA 206)  
 MAILING ADDRESS: P.O. BOX 24026  
 SEATTLE, WASHINGTON 98124

*B.F. SHAW P.O. L-575*  
*ITEM - 2 TYPE 4A*

CUSTOMER

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

Date 10-29-75  
 Customer's Order No. 03177  
 Our Invoice No. 6153 FS  
 Contract No.

*Attn: Mr. E.C. Anderson*

HEAT NO.	MATERIAL	DESCRIPTION	SPEC.
16634	LF-1 MOD	4 PENETRATION HEADS PER DWG 79736-A2.0 REV 4 TYPE 4A STOCK 0577-000-91-0001	SA-350 LF-1 MOD BY CODE CASE 1332-6 & TT COMPONENT SPEC CS-F-1 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	OTHER
16634	LF-1 MOD	.25	1.20	.020	.025	.19							

HARDENABILITY - ROCKWELL "C" IN 1/16" OF AN INCH

T NO.	MATERIAL	1	2	3	4	5	6	8	10	12	14	16	20	24	28	32	HARDNESS RHN OR RC
																	137 BHN

MECHANICAL PROPERTIES

TEST NO.	HEAT NO.	MATERIAL	YIELD 1/2" DIA. IN.	TENSILE 1/2" DIA. IN.	ELONG. 2" GAGE	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 1225°F - .26 HOURS ✓

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



WE CERTIFY THAT THE MATERIAL COVERED BY THIS REPORT HAS BEEN INSPECTED & TESTED IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS DESCRIBED HEREIN, AND THIS REPORT AND SAMPLE SUBJECT TO EXAMINATION

KARLE M. JORGENSEN CO.

U.S. PATENT AND TRADEMARK OFFICE  
 MADE IN U.S.A. DAY OF \_\_\_\_\_ 1975

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

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 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:



*[Handwritten signature]*

IMPACT TEST REPORT

Appendix I  
QC G-32-05-01 ITEM-2  
Effective 3/25/74 TYPE-4

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) RIEHL R 71684 Calibration Date 8-1-75

SPECIMEN:

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

Orientation & Location TANGENTIAL - 1" BELOW SURFACE.

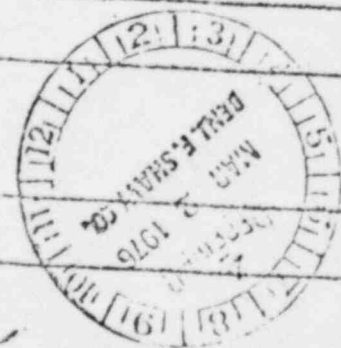
Notch Orientation PERPENDICULAR TO SURFACE.

Type CHARPY V-NOTCH No in Set 3

RESULTS:

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

REMARKS:



*B. F. Shaw*

EARLE M. JORGENSEN CO.

Stock No. 577-000-91-0001  
B.F. Shaw P.O. No. 1-5739

B.F. SHAW

FORGE DIVISION

8531 E. MARGINAL WAY SOUTH • PHONE 702-1100 (AREA 206)

MAILING ADDRESS: P. O. BOX 21075

SEATTLE, WASHINGTON 98124

ITEM-2  
TYPE-40

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

Date 1-15-76  
Customer's Order No. 03777  
Our Invoice No. 6153 IS

MANUFACTURER: EARLE M JORGENSEN CO	MATERIAL: LF-1 HOJ
DESCRIPTION OF ITEMS:	HEAT NO. SPEC. G32-04-05, REV 3
PENETRATION HEADS PER DWG 79716-A2.0 REV 4 TYPE 43	16634
STOCK #577-000-91-0001	
	OPERATOR: AL SCHLENIER

EQUIPMENT: KDT-130		LEVEL				
ITEM	FREQUENCY	SEARCH UNIT	PULSE LENGTH VIDEO-IF	REFLECT (ZERO SUPPRESS)	SURFACE COND.	COUPLANT.
ALL	2.25 MHZ	1" ACCUSCAN	MIN	OFF	MACHINED	OIL

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. G32-04-01
TEST CONDITIONS: SURFACE MACHINED. WET CONTINUOUS METHOD WITH BLACK PARTICLES. CLAMP 5,000 AMPS. CRQ 14 EQUIPMENT.	
DESCRIPTION OF DEFECTS FOUND IF ANY: ACCEPTABLE PER G32-04-01.	OPERATOR: AL GEORGE
BENJAMIN F. SHAW CO.	LEVEL
CMTR NO. L5754-1	
PAGE 19 OF 32	



INSPECTED BY: \_\_\_\_\_  
 WE CERTIFY THE ABOVE TO BE IN ACCORDANCE WITH THE RECORDS CONTAINED IN OUR FILES  
 EARLE M. JORGENSEN CO.

BY: *Rob. A. ...*

FIELD AND SWORN TO BEFORE ME  
 DAY OF \_\_\_\_\_ 1976



FORGING DIVISION  
 8531 E. MARGHAY WAY SOUTH - P.O. BOX 704 (TACOMA, WASH.)  
 MAILING ADDRESS - P.O. BOX 70007  
 SEATTLE, WASHINGTON 98122

Date: 12-8-75  
 Customer's Order No. 03777  
 Our Estimate No. 6189 IS  
 Contract No.

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

ATTN: MR E A ANDERSON

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

CHEMICAL ANALYSIS

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

HARDENABILITY - FURNACE "C" HEAT TREATING

NO.	MATERIAL	1"	2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	22"	24"	HARDNESS MIN. OF RC
																		187 BHN

MECHANICAL PROPERTIES

TEST NO.	HEAT NO.	MATERIAL	YIELD (ASTM A 370)	TENSILE (ASTM A 370)	ELONGATION (ASTM A 370)	REDUCTION OF AREA (ASTM A 370)	TEMPERATURE	ORIENT.	MACRO	IMPACT
N 1-T	9483	LF-1	60,000	80,000	27.5	64.9	QTP			SEE APPENDIX Y
N 2-T	9483	LF-1	65,000	85,000	29.0	58.1	QTP			
N 3-T	9483	LF-1	62,500	84,000	29.0	58.6	QTP			
N 4-T	9483	LF-1	65,500	85,000	28.5	57.3	QTP			

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.

HEAT TREATED AT:  
 1600°F - 16 HOURS ✓  
 1250°F - 22 HOURS ✓

BENJAMIN F. SHAW CO  
 CMR NO. L-5754-1  
 PAGE 20 OF 32



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

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

Signature: JAMES H. JOHNSON  
 Title: [unclear]

EARLE M. JORGENSEN (C.)

Appendix I  
 QC G-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 CO. Lab Number 6189 ES  
 Testing Machine (Type, Model) RIEME # 21684 Calibration Date 8-1-75

SPECIMEN:  
 Heat Treatment STRESS RELIEVED AT 1175 °F TO 5 HOURS.

Orientation & Location TANGENTIAL TO FLOW 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	100 ft-lbs	25 mils	INEL ONLY
S/N 1-T	140°	57# ✓	.053	70%
1-T	140°	57# ✓	.055	75%
1-T	140°	65# ✓	.056	75%
S/N 2-T	140°	45# ✓	.047	45%
2-T	140°	44# ✓	.050	40%
2-T	140°	40# ✓	.03E	40%

REMARKS:



BENJAMIN F. SHAW CO.  
 CONTR 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 IS  
 Testing Machine (Type, Model) RIEMLE R 71686 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 CHARLY V-NOTCH No 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%

REMARKS:



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 • PHO: E 762-3100 (AREA 209)  
MAILING ADDRESS: P. O. BOX 21076  
SEATTLE, WASHINGTON 98124

CUSTOMER

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

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

MANUFACTURER: EARLE M JORGENSEN CO	MATERIAL LF-1 MOD
DESCRIPTION OF ITEMS:	HEAT NO. SPEC. G32-04-05, REV 3
4 PENETRATION HEADS PER DWG 79736-A2.0, REV 4, TYPE 4A UNIT 2, STOCK #577-000-91-0001	9483 ✓
EQUIPMENT: UM 715	OPERATOR AL SCHLONKE LEVEL

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

SPEC. G32-04-04
OPERATOR AL GEORGE
LEVEL

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

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.  
*Boo Newen*

DEPOSED AND SWORN TO BEFORE ME  
\_\_\_\_ DAY OF \_\_\_\_\_ 19\_\_\_\_  
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  <i>ITEM #4</i> <i>L.O. DELGEORGE</i> <i>GR. 5/20/81</i> <i>B21-F022A</i>

*CP Bartow 3-15-73*

REVIEWED BY:                      DATE

Quality Control Representative

General Electric Co. - Atomic Power Equip. Dept.

CHEMICAL ANALYSIS

21.68	SHARON	.13	.51	.010	.010	.70	1.15	.51				
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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

Prealloy	600	12 hours				
Temper	1250	12 hours				

RECEIVED  
 JUN 1 1973  
*6/14-73*

DESCRIBED AND SWORN TO BEFORE ME  
 SS#464-82-7815  
  
 THIS 15th DAY OF MARCH 1973  
*Robert P. Boffing*  
 NOTARY PUBLIC

I CERTIFY THAT THIS IS A TRUE COPY OF ORIGINAL AND THAT NO FILE AT THE OFFICE OF GULF FORGE CO. AND THIS ITEM WAS MANUFACTURED AND FORGED IN THE UNITED STATES OF AMERICA

BY *Ray 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

N

QUANTITY	DESCRIPTION
3	MACH DISC PER DWG A-181102 24.12"OD x 10.62"LG.  (ASME SA182 F-11) RMC-02271 REV 1

*1B21-7022A*

*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 ✓	79,000 ✓	30.0 ✓	60.5 ✓	179 ✓				
46,000 ✓	78,000 ✓	31.0 ✓	50.0 ✓	179 ✓				

**HEAT TREATMENT**

Normalise	1600	12 hours		
Temper	1250	12 hours		

GULF FORGE COMPANY  
 APPROVED  
*6-14-73*  
*JAB* LAB.

*3-15-73*

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

15th DAY OF MARCH 1973  
*Robert P. Cooper*  
NOTARY PUBLIC

BY *Sam V. Perault*

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



Flow Control Division  
Rockwell International

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

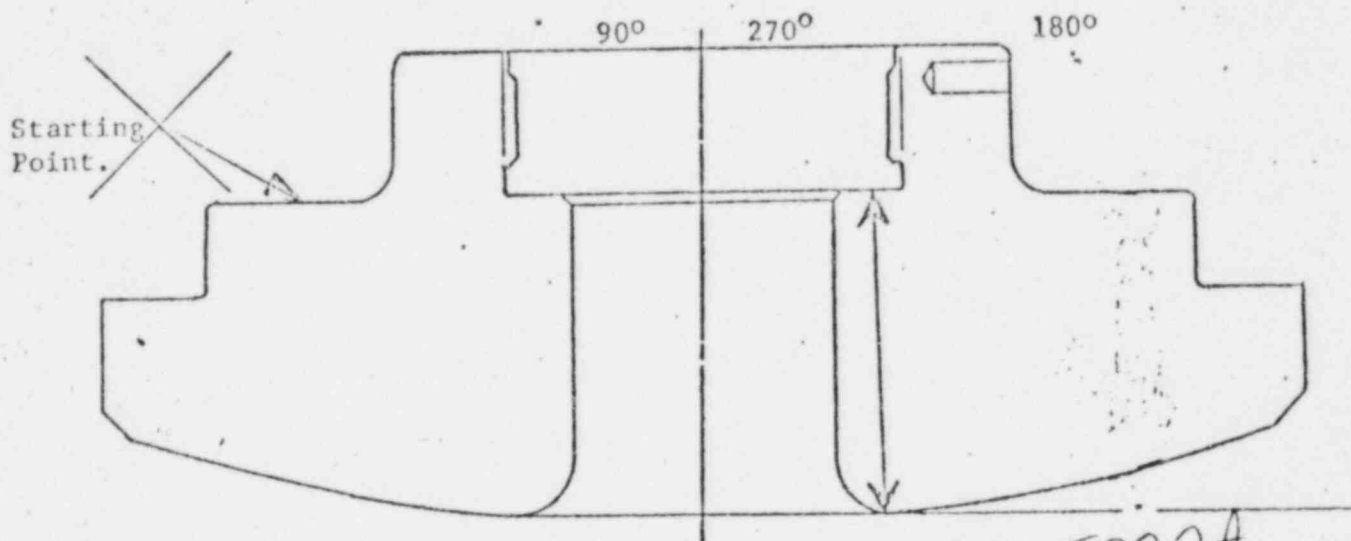
Customer GMRL ELECTRC

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

Stamp X on part as starting point.

Method of Measurement: Transfer Calipers   
Dial Calipers

UT

depth scale

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

*Glen #5*

1B21F010A

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 P.P.H.T (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 + Dretinn</u>	<u>Lynn + Dretinn</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>20 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	<p><i>*Furnace Cool 1440°-1450°F 1 Hr. 10 min.                  Furnace Cool 1420°-1430°F 45 min                  water Quench</i></p>		

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

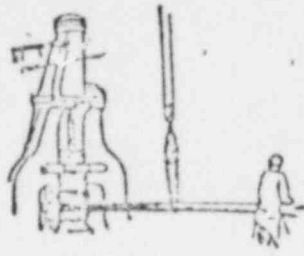
- \*N = Normalize or homogenize
- Q = Quench or harden
- T = Temper
- SA = Solution Anneal
- PWHT = Post Weld Heat Treat (Stress relieve)

PREPARED BY J. Miller  
 Quaker Alloy Casting Company

TITLE O.C. Report  
 DATE 6-30-76



Item #6



TEST REPORT

WESTERN FORGE & TOOL WORKS  
Quality Forgings

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

1B21-F032A

*[Signature]*  
J-2939

Mailing Address  
P.O. Box 1649  
OAKLAND, CALIFORNIA 94604

BONNET

S  
O  
L  
D

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

S  
H  
I  
P

CUSTOMER ORDER NO.	6918	QUANTITY	4	ORDER DATE	6/14/77	INVOICE DATE	7/7/77	INVOICE NO.	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	RED OF AREA %	BIIN	ROCK WELL	BEN D	EMB	MACRO	MICRO	DECARB		
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/H 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

*[Signature]*  
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  
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.

P.O. 3985  
SJO 5660-01

1 B21-F032A  
BONNET  
J-2939

REPORT

CHARPY 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 *[Signature]*

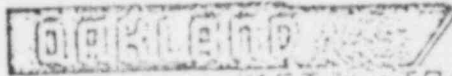
2cc: A/D Valve  
dvd

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. 63879 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, 213, 4  
TAG: 5660-01 → 1910 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