



PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-4502

March 13, 1984

JOHN S. KEMPER
VICE-PRESIDENT
ENGINEERING AND RESEARCH

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket Nos. 50-352
50-353

Subject: Limerick Generating Station, Units 1&2
Request for Additional Information
from NRC Equipment Qualification
Branch (EQB)

References: Telecon between J. Jackson (NRC/EQB)
and J. J. Whittle (PECO) on 2/2/84

File: GOVT 1-1 (NRC)

Dear Mr. Schwencer:

Enclosed per the reference telecon is:

1. Anchor/Darling Valve Company Drawing No. 93-14182, Rev. C (8031-P-104C-34-4)
2. Correspondence regarding HPCI, RCIC, and RWCU containment isolation valves closure capabilities after HELB between Bechtel and Anchor/Darling.
3. Static deflection test of HPCI containment isolation valve: Required loads, acceptance criteria, and test data.
4. Material Requisition No. 8031-P-104, Revision 23.
5. Design Specification No. 8031-P-104, Revision 9.

Sincerely,

John S. Kemper

JHA/gra/021684335

cc: See Attached Service List

*A049
1/1*

8403190197 840313
PDR ADJCK 05000352
A PDR

cc: Judge Lawrence Brenner (w/o enclosure)
Judge Peter A. Morris (w/o enclosure)
Judge Richard F. Cole (w/o enclosure)
Troy B. Conner, Jr., Esq. (w/o enclosure)
Ann P. Hodgdon, Esq. (w/o enclosure)
Mr. Frank R. Romano (w/o enclosure)
Mr. Robert L. Anthony (w/o enclosure)
Mr. Marvin I. Lewis (w/o enclosure)
Charles W. Elliot, Esq. (w/o enclosure)
Zori G. Ferkin, Esq. (w/o enclosure)
Mr. Thomas Gerusky (w/o enclosure)
Director, Penna. Emergency (w/o enclosure)
Management Agency
Mr. Steven P. Hershey (w/o enclosure)
Angus Love, Esq. (w/o enclosure)
Mr. Joseph H. White, III (w/o enclosure)
David Wersen, Esq. (w/o enclosure)
Robert J. Sugarman, Esq. (w/o enclosure)
Spence W. Perry, Esq. (w/o enclosure)
Jay M. Gutierrez, Esq. (w/o enclosure)
Atomic Safety & Licensing (w/o enclosure)
Appeal Board
Atomic Safety & Licensing (w/o enclosure)
Board Panel
Docket & Service Section (w/o enclosure)
Martha W. Bush, Esq. (w/o enclosure)
James Wiggins (w/o enclosure)

Enclosure 2

Correspondence regarding HPCI, RCIC, and RWCU containment isolation valves closure capabilities after HELB between Bechtel and Anchor/Darling.

Note: See sheet 7 for correspondence confirming HPCI valve closure capability.



TELETYPE MESSAGE FORM

SPECIAL INSTRUCTIONS:

STANDARD
 URGENT

BECHTEL RESTRICTED
 BECHTEL CONFIDENTIAL
 STRICTLY CONFIDENTIAL

MULTIPLE ADDRESSES ARE TO BE:
 SHOWN NOT SHOWN

TIME STAMP

DATE AND TIME PREPARED **OCT 20 1981**

PR

JOB NUMBER SUBNUMBER ORGANIZATION CODE ORIGINATOR'S EMPLOYEE NUMBER

CHG 8031 7PE2145 643343

- LELB
- LLCN
- LKOR
- LMAD
- LPAR
- LPRS
- LRIO
- LSAO

- MAUB(22463)
- MAUH(25604)
- MBUH(23668)
- MLED(400309)
- MJUB
- MKLUW
- MRIV
- MRUW(23712)
- MSAU

- SANN
- SBOG
- SCMS
- SGAI
- SHOU
- SMED
- SMEL
- SMIN
- SNOR
- SSFO
- STKO
- SMRL
- STRL

NOTE: STANDARD PROCEDURE IS ALL ACTION & CC ADDRESSES WILL BE SHOWN (EXCEPT IN CASE OF BIDDERS) UNLESS INDICATED DIFFERENTLY IN 'SPECIAL INSTRUCTIONS'

LIST ALL ADDRESSES BEFORE TEXT

ANCHOR/DARLING VALVE
701 FIRST ST.
WILLIAMSPORT, PA 17701

ATTN: MR. W. COLLINS

SUBJECT: JOB NO. 8031
LIMERICK
P.O. 8031-P-104C
-107A

WRITTEN RESPONSE REQ. THRU PDCC

NO
 YES DUE **10/30**

RESPONSE TO CHRON.

NO. **NA**

COMPLETE
 PARTIAL

In reply please reference:
 Doc. Control No. **111775**

THE MAXIMUM FLOW RATE EXPECTED HAS BEEN REVISED FOR THE FOLLOWING VALUES

- AS NOTED:
- (HPCI) P.O. P-104CC
 - (RCIC) ITEM 21.1-21.4 FLOW RATE 5.3 x E6 LBS/HR
 - ITEM 22.1-22.4 FLOW RATE 1.4 x E6 LBS/HR
 - P.O. P-107A:
 - (RWCU) ITEM 16.1-16.4 FLOW RATE 5.83 x E6 LBS/HR

NOTE: ACTUAL OPERATING DELTA P WILL REMAIN THE SAME.

PLEASE CONFIRM THAT THE VALUES ARE SUITABLE FOR THE CONDITIONS NOTED ABOVE. YOUR RESPONSE IS REQUESTED BY 10-30-81

bcc: O.G. BROWN, E. PATEL, N. TYLER, M. TYER, H. WINITSKI

ORIGINATOR R.H. ELIAS PROJECT ENGINEER SIGNATURE *M. Tyler / RHE* LOCATION 221/2 PHONE 2092 PAGE 1 OF 1

11732
MWS/EDP (or) 10/19

ENCL(2), sk 2/7



IS14 0048 23:03GMT 10/23/81
SSFO 0272 23:05GMT 10/23/81
---RETRIEVED MESSAGE---

To J. SUTTON
FLASH COPY

WU INFOMASTER 1-0273580296 10/23/81
TLX DARLING WIP
ZCZC 883 PD WILLIAMSPORT PENNSYLVANIA
TLX 34783 BECHTEL B SFO
ATTN R H ELIAS

BT
SUBJECT PD 8031-P-104C
PD 8031-P-107A
LIMERICK UNITS 1 & 2

TO RESPOND TO YOUR 10/20/81 TELEX A/DU NEEDS TO KNOW
FLUID DENSITY OR SPECIFIC VOLUME AT THE STATED FLOW
CONDITIONS

ANCHOR/DARLING VALVE COMPANY
BILL COLLINS
TELEX 841438 OCTOBER 23 1981 705 PM

COPY TO
R MAIETTA
R ESPLIN
R RINEHART

NNNN

1804 EST

/NO EOM/



ENCL(2), sk 3/7

TELETYPE MESSAGE FORM

SPECIAL INSTRUCTIONS:

- STANDARD
- URGENT
- BECHTEL RESTRICTED
- BECHTEL CONFIDENTIAL
- STRICTLY CONFIDENTIAL

MULTIPLE ADDRESSES ARE TO BE:

- SHOWN
- NOT SHOWN

RECEIVED
CORP. ENGINEERING
10:05 23 OCT 1981

TIMESTAMP

DATE AND TIME PREPARED **OCT 30 1981**

Sunday 11/2

PR									
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JOB NUMBER/SUBNUMBER ORGANIZATION CODE ORIGINATOR'S EMPLOYEE NUMBER

CHG **8031** **7PE2145** **643543**

- LELB
- LLON
- LKOR
- LMAD
- LPAR
- LPRS
- LRIO
- LSAO

- MAUB(22463)
- MAUH(23604)
- MBUH(23668)
- MJED(400309)
- MJUB
- MKDW
- MRIY
- MRLW(23712)
- MSAU

- SANN
- SBOG
- SCMS
- SGAI
- SHOU
- SMED
- SMEL
- SMIN
- SNOR
- SSFO
- STKC
- SMRL
- STRL

NOTE: STANDARD PROCEDURE IS ALL ACTION & CC ADDRESSES WILL BE SHOWN (EXCEPT IN CASE OF BIDDERS) UNLESS INDICATED DIFFERENTLY IN "SPECIAL INSTRUCTIONS"
LIST ALL ADDRESSES BEFORE TEXT

ANCHOR DARLING VALVE
701 FIRST ST
WILLIAMSPORT PA 17701
ATTN: B. COLLINS

SUBJ: JOB NO. 8031
LIMERICK
P.O. 8031-P-104C
-P-107A

In reply please reference:
 Doc. Control No. **112427**

WRITTEN RESPONSE REQ. THRU PDCC	
<input checked="" type="checkbox"/> NO	DUE _____
<input type="checkbox"/> YES	DUE _____
RESPONSE TO CHRON.	
NO. NA	COMPLETE
<input type="checkbox"/> COMPLETE	PARTIAL

REF: AIDY TELEX, DTD 10/23/81

SPECIFIC VOLUMES AT BEGINNING OF TRANSIENT ARE AS FOLLOWS:

^{HPCI} 55-1F002, 1F003; ^{RCC} 49-1F007, 1F008 - 0.4343 FT³/LB
^{RWCU} 44-1F001, 1F004 - 0.02122 FT³/LB

PLEASE ADVISE IF FURTHER INFO IS REQ'D.

bcc: O.G. BROWN, M. IYER, E. PATEL
 N. TYLER,

MWS (PP) *[Signature]* 10.28

ORIGINATOR R.H. ELIAS PROJECT ENGINEER	SIGNATURE <i>[Signature]</i>	LOCATION 221/2	PHONE 2092	PAGE OF 1 1
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ENCL(2), sh 4/7

IS14 0047 19:15GMT
SSFO 0236 19:18GMT 11/05/81
---RETRIEVED MESSAGE---

WU INFOMASTER 1-0149240309003 11/05/81
TLX DARLING WIP
ZCZC 1012 PD WILLIAMSPOT PENNSYLVANIA
TLX 34783 BECHTEL B SFO
ATTN R H ELIAS

To J. Sutton
FLASH COPY

BT
SUBJECT PD 8031-P-104-CL
8031-P-107-A
REFERENCE DCN 111775

STATED FLOW CONDITIONS RESULT IN PIPE VELOCITY OF 1282 FT/SEC
FOR ITEMS 21.1 - 21.4 AND 4500 FT/SEC FOR ITEMS 22.1 - 22.4.
THE VALVES ARE NOT SUITABLE FOR THESE VELOCITIES.

FLOW CONDITIONS ARE ACCEPTABLE FOR ITEMS 16-1 - 16.4

ANCHOR/DARLING VALVE COMPANY
BILL COLLINS
TELEX 841438 NOVEMBER 5 1981 215 PM

COPY TO
R MAIETTA
R ESPLIN
R RINEHART

NNNN

1418 EST

/NO EDM/



ENCL(2), sh 5/7

TELETYPE MESSAGE FORM

SPECIAL INSTRUCTIONS:

STANDARD
 URGENT

BECHTEL RESTRICTED
 BECHTEL CONFIDENTIAL
 STRICTLY CONFIDENTIAL

MULTIPLE ADDRESSES ARE TO BE:

SHOWN NOT SHOWN

TIME STAMP

DATE AND TIME PREPARED **NOV 10 1981**

PR

CHG 8031 7 PE 2145 643343

- LELB
- LLOK
- LKOR
- LMAD
- LPAR
- LPRS
- LRIC
- LSAO

- MAUB(22463)
- MAUH(23604)
- MBUH(23668)
- MJED(400309)
- MJUB
- MKUW
- MRIY
- MRUW(23712)
- MSAU

- SANN
- SBOG
- SCMS
- SGAI
- SHOU
- SMED
- SMEL
- SMIN
- SNOR
- SSFO
- STKO
- SMRL
- STRL

NOTE: STANDARD PROCEDURE IS ALL ACTION & CC ADDRESSES WILL BE SHOWN EXCEPT IN CASE OF BIDDERS UNLESS INDICATED DIFFERENTLY IN SPECIAL INSTRUCTIONS
LIST ALL ADDRESSES BEFORE TEXT

**ANCHOR/DARLING VALVE
701 FIRST ST.
WILLIAMSPORT, PA 17701**

ATTN: B. COLLINS

**SUBJ: JOB NO. 8031, LIMERICK
P.O. P-104CC
P-107A**

In reply please reference:

Doc. Control No. **113051**

- REF: 1) BPC TWX DTD 10/20/81 (111775)
 2) BPC TWX DTD 10/30/81 (112427)
 3) TELECON, M. SCHLETZ/R. MAIETTA

**THIS IS ISSUED TO CONFIRM THE REF(3) TELECON.
THE INFORMATION REQUESTED BY REF(1) AND (2)
SHOULD BE CLARIFIED AS FOLLOWS:**

**THE VALVES NOTED IN THE REFERENCES ARE
USED IN THE HPCI, RCIC AND RNCU SYSTEMS;
AND WILL BE USED FOR CONTAINMENT ISOLATION
IN THE CASE OF A PIPE RUPTURE IMMEDIATELY
DOWNSTREAM OF THE VALVES(HELB). THE
EXPECTED FLOW IS IN EXCESS OF THAT
PREVIOUSLY SPECIFIED AS NOTED BELOW:**

WRITTEN RESPONSE REQ.
THRU PDCC

NO _____
 YES _____ DUE **11/16**

RESPONSE TO CHRUN.

NO _____
 _____ COMPLETE
 _____ PARTIAL

ORIGINATOR **R.H. ELIAS
PROJECT ENGINEER**

SIGNATURE **Msdger/RHE**

LOCATION **221/2**

PHONE **2092**

PAGE OF **1 2**

RECNET

ENLL(2), sh 6/7
TELETYPE MESSAGE FORM
CONTINUATION SHEET

113051

P-104CC (HPCI)

- 1) ITEM 21.1-21.4 (HV-1FOO2, 1FOO3) - AT T=0 SEC. PIPE BREAKS WITH RESULTANT FLOW EQUAL TO 1470 LBM/SEC. AT T=0.135 SEC FLOW RATE REDUCES TO 328 LBM/SEC, AND REMAINS CONSTANT UNTIL VALVE CLOSES. RCIC
- 2) ITEM 22.1-22.4 (HV-1FOO7, 1FOO8) - AT T=0 SEC. PIPE BREAKS WITH RESULTANT FLOW EQUAL TO 380 LBM/SEC. AT T=0.181 SEC FLOW RATE IS 168 LBM/SEC. AT T=0.302 SEC FLOW RATE IS 41.5 LBM/SEC. AND REMAINS CONSTANT UNTIL VALVE CLOSES.

BOTH CASES HAVE STEAM WITH SPECIFIC VOLUME EQUAL TO 0.4343 FT³/LB. AT START OF TRANSIENT.

QUESTION: WILL THE VALVES CLOSE AGAINST THE FLOW CONDITIONS NOTED ABOVE.

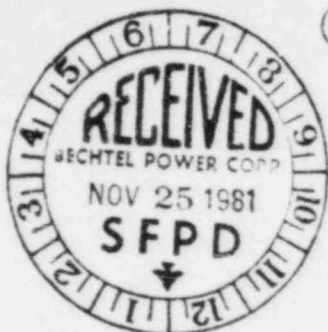
SHOULD FURTHER INFO BE REQUIRED PLEASE ADVISE. MAY WE HAVE YOUR RESPONSE BY 11-16-81.

MWS/EDP (PP)

[Handwritten initials and date]
11/9

bcc: O.G. BROWN, M. IYER, E. PATEL, N. TYLER
K. WALTERS

ORIGINATOR	SIGNATURE	LOCATION	PHONE	PAGE OF
				22



ENCL (2), sh 7/7

IS14 0035 19:00GMT
SSFO 0198 19:03GMT 11/25/81
---RETRIEVED MESSAGE---

WU INFOMASTER 1-015952A329 11/25/81
TLX DARLING WIP
ZCZC 1061 PD WILLIAMSPORT PENNSYLVANIA
TLX 34783 BECHTEL B SFO
ATTN R H ELIAS

To J. SUTTON
FLASH COPY

BT
SUBJECT LIMERICK PD 9031-P-104CC
A/DV E-6179-8,9
REFERENCE DCM 111775 AND 113051
VALVES 21.1 - 21.4 AND 22.1 - 22.4 ARE DESIGNED TO CLOSE AGAINST
PIPE REPTURE FLOW CONDITIONS STATED ON DCM'S

ANCHOR/DARLING VALVE COMPART
G G FLEXER
TELEX 841438 NOVEMBER 25 1981 200 PM

COPY TO
R T MEEK R E RINEHART
R J ESPLIN J B MORIARTY
R H MAIETTA R L STANNERT
E-6179

NNNN

1404 EST

/NO EDM/

Enclosure 3

Static deflection test of HPCI containment isolation valve:
Required Loads, acceptance criteria, and test data.

S.O. R1573 Item No. 9 ENCL (3), sh 1/3
Serial No. E 6179-8-4

10" EOO Y G1.6c

1. Static Load

12700 Rmm
1-31-83
ANI R-
RWIM

Horizontal Load		Vertical Load		Distance h.	
Required	Actual	Required	Actual	Required	Actual
10970	12700	9721	10,000	42.5"	39.1"
Performed by <u>J. Russell</u>				Date <u>1-31-83</u>	

39.1" Rmm

BECHTEL
615
1-31-83

2. End Load N/A

Axial Load		Bending		Torsion		Shear	
Req.	Actual	Req.	Actual	Req.	Actual	Req.	Actual
N/A		-		-		-	
Performed by _____				Date _____			

3. Internal Pressure

1-31-83
ANI R-
RWIM

Required	Actual
1337	1350

BECHTEL
615

Performed by J. Russell 1-31-83 Date 1-31-83

4. Performance Requirements 368 volts

Required Cycles 2 Max. Closing Time 12 sec
Max. Open Time 12 sec

BECHTEL
615
1-31-83

1-31-83
ANI R-
RWIM

Cycle No.	Close Time	Open Time	Cycle No.	Close Time	Open Time
<u>1</u>	<u>11 sec.</u>	<u>10 sec</u>			
<u>2</u>	<u>11 sec.</u>	<u>10 sec</u>			

Performed by J. Russell Date 1-31-83

5. Seat Test

EPS-105-2

2-1-83
RWIM

Pressure		Duration		Leakage	
Required	Actual	Required	Actual	Allowable	Actual
1471	1471	4 min	4	20cc/hr	3.6
-		-		-	
Performed by <u>J. Russell</u>				Date: <u>1-31-83</u>	

095
Ruled
2/1/85

2-1-83

Page 32 31A

ANCHOR/DARLING VALVE COMPANY

BY RM DATE 11-23-82 SUBJECT Static Seismic Testing SHEET NO. 1 OF 2

Δ Rev A 1/31/83 RM

P.O.: 8031-P-104-CCValve Size: 10" 600 V GlobeItem: 21.4A/DV Item: EG179-8-410-EBA-GB-MD-SS-2F003Valve centerline to yoke c.g. = 37.95 in.Valve centerline to operator c.g. = 53.46 in.Yoke weight = 321 lbs. (incl. stem)Operator weight = 1765 lbs.

$$(h)_{\text{calc.}} = \frac{321(37.95) + 1765(53.46)}{2086} = \underline{51.1} \text{ in.}$$

$$(\text{horiz. load})_{\text{calc}} = \underline{2086} \text{ lbs.} \times \underline{4.666} = \underline{9721} \text{ lbs.}$$

$$\Delta h_{\text{actual}} = \underline{39.1} \text{ in.} * = \text{distance from valve centerline to operator-yoke flange, where horizontal load will be applied.}$$

$$\Delta \therefore \text{horiz. load} = \underline{9721} \text{ lbs.} \left(\frac{51.1}{39.1} \right) = \underline{12700} \text{ lbs.} *$$

$$\text{vertical load} = \underline{2086} \text{ lbs.} \times \underline{4.666} = \underline{9721} \text{ lbs.} *$$

S.O. E 6179 Item No. 8

Date 11-23-82

Serial No. 4

Δ Rev A 1/31/83

Project Engineer R M Smith

1. Static Loads

Seismic Accelerations: 4.66 vertical
4.66 horizontal
- horizontal

Valve Weight: - lbs.

Static Load (min.): 9721 lbs vertical
12700 lbs horizontal

Δ

Δ

Distance h (min.): 39.1 in.

Yoke Leg Orientation ✓ As shown in Figure 1
Rotated 90°

2. End Loads

Required End Loads (min.): - Axial Tension lbs.
- Bending in-lbs.
- Torsion in-lbs.
- Shear lbs.

3. Internal Pressure

Internal Pressure (min.): 1337 psig

Test Fluid: water

4. Performance Requirements

Voltage: 368 Ac

Number of Close Cycles Required: 2

Maximum Closure Time: 12 sec.

Maximum Open Time: 12 sec.

5. Seat Leakage Requirements

Maximum Allowable Leakage: 20 cc/hr Test Pressure: 1471 psi

Test Duration (min.): 4 minutes

Remarks: _____

EPS-105-1

ENCL (4)



MATERIAL REQUISITION

MATERIAL: Nuclear Service, Carbon Steel Gate, Globe and Check Valves, 600# Rating and Higher, 2 1/2" and Larger.

BECHTEL AUDIT REQUIRED YES NO

SHOP INSPECTION IS IS NOT REQUIRED

COST CODE: TO 5420

JOB SITE DELIVERY DATE: UNIT 1:

10CFR21 is applicable

UNIT 2:

M/R STATUS

REV NO	DATE	REVISIONS	ORIGINATOR (NAME)	APPROVALS	T/NO.
0	4-27-71	ISSUED FOR RIDS	Z. YOUSIF	[Signature]	
1	5-6-71	REVISED AS MARKED	Z. YOUSIF	[Signature]	
2	8-14-72	ISSUED FOR PURCHASE	Z. YOUSIF	[Signature]	
3	9-16-72	REVISED AS MARKED	Z. YOUSIF	[Signature]	
4	9-20-72	REVISED ITEMS 11.1 & 11.2	Z. YOUSIF	[Signature]	
5	10-2-72	REVISED ITEMS 3.9 & 3.10	Z. YOUSIF	[Signature]	
6	1-2-74	REVISED AS MARKED	[Signature]	[Signature]	
7	7-15-75	REVISED AS SHOWN ON SHEET 2	M. Schlotz	[Signature]	
8	12-3-75	REVISED AS SHOWN ON SHEET 2	M. Schlotz	[Signature]	
9	4-14-76	REVISED AS SHOWN ON SHEET 2	M. Schlotz	[Signature]	
10	1-24-77	REVISED AS SHOWN ON SHEET 2A	K. P. [Signature]	[Signature]	
11	3-24-77	REVISED AS SHOWN ON SHEET 2A	M. Schlotz	[Signature]	
12	1-5-78	REVISED AS SHOWN ON SHEET 2A	M. Schlotz	[Signature]	
13	6-29-78	REVISED AS SHOWN ON SHEET 2A	M. Schlotz	[Signature]	
14	4/16/79	REVISED AS SHOWN ON SHEET 2A	M. Schlotz	[Signature]	

* ALL NUCLEAR VALVES ARE TO BE CONSIDERED AS Q-LISTED ITEMS

Job Requisition No. 8031-P-104 Rev. 23



MATERIAL REQUISITION

M/R STATUS

REV NO	DATE	REVISIONS	ORIGINATOR (NAME)	APPROVALS	T/NO.
15	9-27-79	REVISED AS SHOWN ON SHEET 2A	M. Schlets	[Handwritten initials]	
16	2-11-80	REVISED AS SHOWN ON SHEET 2A	R. Vant...	[Handwritten initials]	
17	4/20/81	REVISED AS SHOWN ON SHEET 2A	R. Vant...	[Handwritten initials]	
18	5/25/82	Revised as shown on sheet 2A	JT Sargent	[Handwritten initials]	
19	8/19/82	Revised as shown on sheet 2A	J. Sargent	[Handwritten initials]	
20	9/17/82	Revised as shown on sheet 2A	J. Sargent	[Handwritten initials]	
21	11-16-82	Revised as shown on sheet 2A	J. Sargent	[Handwritten initials]	
22	2/17/82	Revised as shown on sheet 2A	J. Sargent	[Handwritten initials]	
3	5/3/83	REVISED SHEETS 1, 2A, 3A, 1.1, and 1D AS NOTED.	R. ALVAREZ	[Handwritten initials]	



PURCHASE ORDER NO.

REQUISITION NO.

	REV.
8031-P-104	6

Page 1A of 24 Pages

ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
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Summary of Changes to Revision 1 Incorporated in Revision 2 of M/R 8031-P-104

- Items deleted: 1.5-1.8; 2.1, 2.2, 3.1-3.4, 3.7, 3.8, 3.11, 3.12, 4.9-4.14, 5.1-5.6, 6.1, 6.2, 7.3, 7.4, 8.1, 8.2, 10.1, 10.2.
- Items added: 3.13, 3.14, 4.15-4.22, 6.5-6.10, 9.3, 9.4, 11.1, 11.2, 12.1-12.6, 13.1-13.6.
- Items with revised quantities: 4.1, 4.2.
- Items with description revised: 3.5, 3.6, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 6.3, 6.4, 7.1, 7.2, 9.1, 9.2.
- Design Specification 8031-P-104 introduced.
- Items to be placed on hold: 6.5, 6.6, 13.1, 13.2.

Summary of Changes to Rev. 2 Incorporated in Rev. 3 of M/R 8031-P-104

- Items with description revised: 4.19 thru 4.22.
- Valve Data Sheets revised: Sheets 1 thru 5, 7 thru 9 & 12.

Summary of Changes to Rev. 5 Incorporated in Rev. 6 of M/R 8031-P-104

- Items deleted: 3.5, 3.6, 4.3 thru 4.9, 4.16 thru 4.22, 6.3, 6.4, 6.9, 6.10, 9.3, 9.4, 12.1 thru 12.6, 13.1 thru 13.6
- Items added: 1.9, 1.10, 3.15 thru 3.26, 5.7 thru 5.12, 8.3 thru 8.6, 14.1, 14.2, 15.1, 15.2, 16.1, 16.2, 17.1, 17.2, 18.1, 18.2, 19.1, 19.2, 20.1, 20.2, 6.11 thru 6.14
- Items with revised descriptions: 1.1 thru 1.4, 3.9, 3.10, 6.5 thru 6.8.
- Items with revised quantities: 3.9, 3.10, 4.1, 4.2.



PURCHASE ORDER NO.

REQUISITION NO.

	REV
8031-P-104	10

Page 1B of 24 Pages

ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
----------	----------	-------------	--------------------	------------	-----------

5. Revised Valve Data Sheets No. 1 thru 5, 7 thru 17.
6. Deleted Valve Data Sheet No. 6.
7. Revised Design Specification 8031-P-104 as marked.

Summary of changes incorporated in Rev. 7 of M/R 8031-P-104

1. Revised Design Specification as marked.
2. Revised Valve Data Sheets 8, 10, 11, 16, 17, 3, 12, 4 and added Sheets 18 AND 19.
3. Items deleted: 1.9, 1.10 and 6.11-6.14.
4. Items added: 21.1-21.4, 22.1-22.4, and 4.23-4.26., 4.27, 4.28, 5.13 AND 5.14.
5. CORRECTED MARK No. OF ITEM 18.2
6. ADDED SHEET 3B - "SPECIAL NOTES".

SUMMARY OF CHANGES INCORPORATED IN REV. 8 OF M/R 8031-P-104.

1. ADDED SPECIAL NOTE #6 TO PAGE 3B.

Summary of changes incorporated by Rev. 9 of M/R 8031-P-104,

1. Revised design specification as marked- and added new certification.
2. Added special notes 7, 8, 9, 10, 11 + 12; Deleted 6c(3)e.
3. Revised Valve Data Sheets 2 and 14.
4. Deleted items 5.13 and 5.14

Summary of changes incorporated by Rev. 10 of M/R 8031-P-104

1. Revised Design Specification as marked.
2. Revised Special Note 4.
3. Deleted items 15.1 & 15.2
4. Revised the following items: 3.13, 3.14, 4.0, 4.1, 4.2, 4.23, 4.24, 4.26, 4.27, 4.28, 11.1, 11.2, 18.1, 18.2, 19.1 & 19.2.



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Summary of changes incorporated by Rev. 11 of M/R 8031-P-104

1. Revised Special Note 4 on page 3B.
2. Added Special Notes 13 thru 18 on pages 3E thru 3I.
3. Revised the Design Specification 8031-P-104 as shown on sheet i thereof.
4. CORRECTED THE DESCRIPTION OF ITEMS 3.19, 3.20, 3.23, 3.24, 4.1, 4.2 + 6.8.

Summary of changes incorporated by Rev. 12

1. REVISED SPECIAL NOTE 7 AND 10
2. REVISED VALVE DATA SHEETS 17 & 18

Summary of changes incorporated by Rev. 13

1. Added new items 23.1, 24.1, 25.1, 26.1, 26.2.
2. Added Valve Data Sheet No. 20.
3. Revised Valve Data Sheet No. 17

Summary of changes incorporated by Rev. 14

1. REVISED DESCRIPTION OF ITEMS 23.1, 24.1
2. REVISED VALVE DATA SHEET 20
3. REVISED PARA. 15.3b

Summary of changes incorporated by Rev. 15

1. Added Items 23.2, 3.27 and 3.28
2. Revised Valve Data Sheets 16, 17, 19, 20 & 3
3. Added note to items 3.19, 3.20

Summary of changes incorporated by Rev. 16

1. Added items 27.1 and 27.2
2. Added page 24 and Valve Data Sheet 21
3. Added Special Notes 19.1, 19.2 and 19.3

Summary of changes incorporated by Rev. 17

1. Added item 28.1

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The following changes were made by Rev. 18

- 1. Increased quantity on Item 8.3
- 2. Added Items 29.1, 12.7, 8.7
- 3. Added Valve Data Sheet #22

The following changes were made by Rev. 19

- 1. Added Attachments 3 & 4
- 2. Added Special Note 20
- 3. Added Special Notes 14.3C & 15.3C
- 4. Added Attachment 5

The following changes were made by Rev. 20

Retagged items 4.26 and 29.1

The following changes were made by Rev. 21

- 1. Deleted item 29.1
- 2. Revised Attachments 3 & 4

The following changes were made by Rev. 22

- 1. Added Special Note 21
- 2. Added Item 30.1

The change made by Revision 23


- 1. Revised Attachment 1

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SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.
1	9	3C	9			VALVE DATA							
2	9	3D	9			SHEETS							
3A	9	3E	9			1	6						
4	7					2	9						
5	1					3	7						
6	6					4	7						
7	7					5	6						
8	7					6	DELETED						
9	6					7	6						
10	6					8	7						
11	6					9	6						
12	6					10	7	SEE SHEET 2A					
13	7					11	7						
14	9					12	7						
15	7					13	6						
16	6					14	9						
17	6					15	6						
18	6					16	7						
19	6					17	7						
20	7					18	7						
21	7					19	7						
22	7												
1A	6												
1B	9												
3B	8												

NO.	DATE	REVISIONS	BY	CHK'D	APP'D	NO.	DATE	REVISIONS	BY	CHK'D	APP'D
4	9-20-72	REVISED SHT 18, DATA SHTS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	331	28		9	1-1-74	REVISED SHTS 1, 1B, 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	MWS		
3	9-16-72	REVISED SHTS 13, 1A & DATA SHTS 1 THRU 5, 7 THRU 9 & 12	331	28		8	2-3-74	REVISED SHTS 1, 1B, 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	CHW		
2	8-4-72	REVISED SHEETS 1-19 & DATA SHT 1-9 ADDED SHTS 1A & 20 AND DATA SHTS 10-12 & DESIGN SPEC.	331	28		7	9-15-75	REVISED SHEETS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	CHW		
1	5-6-71	REVISED SHEETS MARKED ABOVE. ADDED DATA SHEETS	331	28		6	1-7-74	REVISED SHTS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	CHW		
0	1-22-71	Issued for Bids	331	28		5	10-2-72	REVISED PAGE 9	CHW		
A	10-30-70	Issued for Approval	331	28							

 POWER AND INDUSTRIAL DIVISION	FACING SHEET LIMERICK GENERATING STATION, UNITS 1 & 2 PHILADELPHIA ELECTRIC COMPANY	JOB No 8031	REV.
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SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.	SHEET	LATEST REV.
1	23	19	10			VALVE DATA				ATTNMENT 3			
1A	6	20	10			SHEETS				SHT.			
1B	10	21	17			1	6			1	0		
2	9	22	7			?	9			2	21		
2A	23	23	15			3	15						
3A	23	3F	19			4	7						
3B	11	3G	11			5	6			ATTNMENT 4			
3C	9	3H	19			6	DELETED			SHT.			
3D	12	3I	22			7	6			1	0		
3E	11	1C	17			8	7			2	23		
4	7	1.1	23			9	6						
5	1	1D	23			10	7						
6	6	16A	18			11	7			ATTNMENT 5			
7	7	24	22			12	7			SHT			
8	7					13	6			1	22		
9	10					14	9			2	22		
10	15					15	6			3	22		
11	15					16	15			4	22		
12	6					17	20			5	22		
13	20					18	12			6	22		
14	9					19	16						
15	17					20	15						
16	18					21	16						
17	18					22	21						
18	18												

10	1-29-77	REVISED SHTS 1, 1B, 2A, 3A, 3B, 9, 11, 13, 18, 19, 20, 21 & DESIGN	JFA			17	4/20/82	REV. SHTS 1, 1.1, 1C, 2A, 15, 21 AND 24	RJL				
11	3-31-77	REV D PGS 1, 2A, 3A, 3B, 3C, 3E, 10, 11, 15 & DESIGN SPEC. ADDED PGS 1C, 3F, 3G, 3H & 3I				18	5/5/82	REV SHTS 1, 1.1, 16, 24, 3A added 1D, 16A, 17, 21, 22	MNC				
12	1-5-78	REVISED SHTS 2A, 3D, 1C, 3A REV SHTS 17 & 18 INCORP. FOR P-378	MNS			19	8/19/82	added data 3+4+5 Rev. SHTS 3F, 3H Rev. 11, 1D, 2A, 3A, 3I, 17, 22	JUL				
13	6-7-78	REVISED SHTS 1, 2A, 3A, 23 AND VALVE DATA SHTS 17 ADDED SHT 20	MNS			20	9/17/82	Rev. valve data SHTS 17 & 22 P1, 1.1, 1D, 2A, 13, 24	JUL				
14	4/16/78	REVISED SHTS 1, 1C, 2A, 3A, 23. VALVE SHT 20	MNC			21	11/4/82	Rev SHTS 1, 1.1, 1D, 2A, 3A, 24 Rev. SHTS 1, 1.1, 10, 2A, 13, 24	JUL				
15	2-21-77	REVISED SHTS 1, 1.1, 2A, 3A, 17, 23 VALVE DATA SHEET 1, 1.1, 18, 20, 21	MNS			22	12/17/82	Rev SHTS 1, 1.1, 10, 2A, 3A, 24, 3A added SHTS 17 & 23	JUL				
16	2-11-80	REV. SHTS 1, 1.1, 2A, 3A, 3F, 3H, 3I, 24 AND DATA SHTS 19, 21	RJL			23	7/3/83	REVISED SHEETS 1, 2A, 3A, 1.1, AND 1D AS NOTED	RBA				
NO.	DATE	REVISIONS	BY	CHK'D	APP'D	NO.	DATE	REVISIONS	BY	CHK'D	APP'D		



POWER DIVISION

FACING SHEET
LIMERICK GENERATING STATION, UNITS 1 & 2
PHILADELPHIA ELECTRIC COMPANY

REQUISITION NO. 8031-P-104

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ATTACHMENTS

1. Design Specification 8031-P-104, Rev. 9, including all contents shown on page (ii) thereof.
2. Valve Data Sheets
 - No. 1, Rev. 6
 - No. 2, Rev. 9
 - No. 3, Rev. 15
 - No. 4, Rev. 7
 - No. 5, Rev. 6
 - No. 6 Deleted
 - No. 7, Rev. 6
 - No. 8, Rev. 7
 - No. 9, Rev. 6
 - No. 10, Rev. 7
 - No. 11, Rev. 7
 - No. 12, Rev. 7
 - No. 13, Rev. 6
 - No. 14, Rev. 9
 - No. 15, Rev. 6
 - No. 16, Rev. 15
 - No. 17, Rev. 20
 - No. 18, Rev. 12
 - No. 19, Rev. 16
 - No. 20, Rev. 15
 - No. 21, Rev. 16
 - No. 22, Rev. 21
3. Valve Operability Test Requirements Sht 1, Rev. 0; Sheet 2, Rev. 21
4. Max "G" force table Sht. 1, Rev. 0; Sht. 2, Rev. 23
5. Witness and Hold Points Shts. 1-6, Rev. 22

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SPECIAL NOTES:

1. The technical requirements listed in this Purchase Order revision are retroactive and apply to all valves to be manufactured under this Purchase Order unless otherwise noted below.
2. All valves on Velan's P. O. 8031-P-104BC are manufactured to ASME Section III 1971 edition, Summer '73 Addenda.
3. All valves on Atwood & Morrill's P. O. 8031-P-104A are manufactured to ASME Section III, 1971 edition, Winter '72 addenda.
4. This note supplements paragraph 3.2 of Specification 8031-P-350. Precipitation hardened materials conforming to ASTM A-564 Grade 630 or A564-XM25 are acceptable alternates. A564 Grade 630 is to be age hardened at 1075^oF, + 15^oF, minimum and A564-XM25 is to be age hardened at 1000^oF, + 15^oF, minimum. This note is retroactive to all valves manufactured to previous revision of the P.O.
5. All valve documentation shall be sent to the field for review and approval unless otherwise shown on Form 8031-QA. This note shall become effective 30 days after issuance of Rev. 7 to the M/R.
6. The motor operated valves supplied by Atwood & Morrill for Items 9.1 & 9.2 of P.O. 8031-P-104A are to meet the requirements of Specification 8031-G-11, Rev. 12 with the following exceptions:
 - a. Limitorque will provide the certification that the motor operators supplied for Items 9.1 & 9.2 are of similar design and construction to those tested and qualified in Franklin Institute Research Lab Report F-C3441. This will satisfy the requirements of Spec. 8031-G-11, Rev. 12, Para. G11.3.4 & G11.8.2.
 - b. Limitorque shall provide a typical motor curve and routine test report for each 30 minute duty rated motor. Typical curves to be actual test not engineering calculated curve, from a lot being furnished to Bechtel. *THIS WILL SATISFY THE REQ'TS OF SPEC. 8031-G-11, REV. 12, PARA. G11.3.4, C+D.*
 - c. Testing of the motor operator will be done in two sections. Limitorque will test the motor



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operator simulating the torque required to close the valve at zero differential pressure. Atwood & Morrill will test operational aspects of the motor operator integrated on the check valve. Certified test reports shall be submitted covering the following:

- (1) Limitorque will demonstrate the operators provide six inches of travel at twelve inches per minute at 70% rated voltage at the motor operator terminals for six cycles (open, close, open). Limitorque will simulate a valve load of 85 ft-lbs. during these six cycles at the 70% rated voltage.
- (2) Atwood & Morrill will conduct (3) operational test cycles of motor operator and check valve to insure valve is closed at zero differential pressure.
- (3) Limitorque will conduct the following tests with a simulated load of 85 ft-lbs. and provide test results for the certified test reports.
 - a. Test voltage and frequency,
 - b. Motor running current drawn during test operation of simulated load of 85 ft.-lbs. in closing direction for motor operators.
 - c. Deleted
 - d. Record settings and performance verification of torque switches and position switches. The position switches shall be set in accordance with Figures 1 or 2 of Spec. 8031-G-11, Rev. 12.
 - e. Included with the test data required by (b) and (c) above is a listing of the test instruments used, identified by manufacturers catalog number, and the instrument range setting for each test.



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		(4) The above will satisfy the requirements of Spec. 8031-G-11, Rev. 12 Para. G11.8.4a, c & d. The requirements of Para. G11.8.4b are not applicable since these are not torque seated valves.			
		d. Atwood & Morrill shall provide in lieu of the design interface procedure (reference Para. G11.10 of Specification 8031-G-11) the following:			
		(1) Certification that Limitorque has provided the required documents for each valve as required in Sheets A5-3 & A5-4 of Design Spec. 8031-P-104, Rev. 3 (Ref. 8031-DR Forms attached to Spec. 8031-G-11, Rev. 12).			
		(2) Certification that Limitorque test data and typical curves meet data of Form 182 and motor operator Valve Data Sheet 9 of M/R 8031-P-104.			
		(3) Certification that Limitorque has met the requirements of Spec. 8031-G-11, Rev. 12 and these clarifications.			
		(4) Customer witnessing and inspection, per A&M's approved production test procedures of valve and motor operator during final testing at A&M.			
		7. All valves on Anchor/Darling's P.O. 8031-P-104CC shall conform to ASME B&PV Code, Section III, 1974 Edition, thru and including Winter 1974 Addenda and Code Cases 1516-2, 1567, 1622 and 1682.			
		8. Atwood & Morrill (P-104A) and Anchor/Darling (P-104C) shall work in accordance with Revision 2 to Specification 8031-G-13. Velan (P-104B) shall work in accordance with Revision 3 to Specification 8031-G-13.			
		9. Code Case 1519 is hereby approved for use on the Atwood & Morrill P.O. P-104A.			
		10. The following supplements Spec. 8031-P-350, para. 4.7.3. Haynes Stellite #21 & Poly Cast No. 21 are acceptable hardsurfacing materials for items on Atwood & Morrill's P.O. P-104A.			



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11. This paragraph is to clarify the requirements of the following Purchase Orders:
- a. Atwood & Morrill (P.O. P-104A) shall work in accordance with Specification 8031-P-350, Revision 4, with Addenda 1 & 2 to Rev.4.
 - b. Velan (P.O. P-104B) shall work in accordance with Specification 8031-P-350, Revision 6, with Addition 1 to Rev.6.
 - c. Anchor/Darling (P.O. P-104CC) shall work in accordance with Specification 8031-P-350, Revision 6.
12. The following supplements Spec. 8031-P-350, Revision 6, para. 8.1. The second paragraph shall only apply to Nuclear Class 2, "Cast" valves, 2½" thru 4" nominal pipe size.
13. QA Program, for Functionally Related Non-Pressure Retaining Valve Parts for Atwood & Morrill's P.O. 8031-P-104A
- The valves of items 9.1, 9.2, 11.1, 11.2, 14.1 & 14.2 were essentially completed or completed and shipped prior to January 5, 1977 and must meet the P.O. requirements in effect at time of completion. There are no additional Quality Assurance requirements for the functionally related non-pressure retaining valve parts.
14. QA Program for functionally Related Non-Pressure Retaining Valve Parts for Velan's P.O. 8031-P-104B
- 14.1 The following are the requirements for the non-pressure retaining parts of the valves on order and yet to be fabricated as of January 5, 1977.
 - 14.1a- Velan procedure VEL-QCI-477, Check List Assembly and Final Inspection (as approved by Bechtel) shall be used for these valves.



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14.1.b - Velan procedure VEL-QC-155, Quality Control of Non-Pressure Boundary Parts (as approved by Bechtel) shall be used for these parts.

14.2 The following are the requirements for the non-pressure retaining parts of the valves added to the P.O. after January 5, 1977:

14.2.a - The stems for gate and globe valves shall meet the requirements for the pressure retaining parts of the valve. This shall include implementation of the appropriate Quality Assurance Program, performance of NDE at a level comparable to that performed on the pressure retaining parts, and submission of the required material test reports.

14.2.b - All of the requirements listed above in paragraph 14.1.

14.3 Applicability:

14.3.a - The requirements of paragraph 14.1. are applicable to the following items: 1.1, 1.2, 1.3, 1.4, 3.9, 3.10, 3.13, ~~3.14~~, 3.15, 3.16, 3.17, 3.18, 3.19, 3.20, 3.21, 3.22, 3.23, 3.24, 3.25, 3.26, 4.1, 4.2, 4.23, 4.24, 4.26, 4.27, ~~4.25~~, 4.28, 7.1, 7.2, 8.3, 8.4, 8.5, 8.6, 17.1, 17.2, 18.1, 18.2, 19.1, 19.2, 20.1 & 20.2.

14.3.b - The requirements of paragraph 14.2 are applicable to the following items: ~~3.27, 3.28~~

14.3.c - Paragraphs 14.1, 14.1a, 14.1.b, 14.2, 14.2.a are applicable to all valves purchased on P104 B after January 5, 1977



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15.0 QA Program for Functionally Related Non-Pressure Retaining Valve Parts for Anchor/Darling's P.O. 8031-P-104CC

15.1 The following are the requirements for the functionally related non-pressure retaining parts of the valves on order and yet to be fabricated as of January 5, 1977:

15.1.a - Certified material test reports shall be made available for the gate and globe valve stems, yokes and for the check valve hangers (includes disc hanger, hinge, hanger block + hinge support) to permit verification of material conformance to the drawing requirements.

15.1.b - The following parts shall be marked to provide evidence of conformance of the materials to the drawing requirements.

Gate & Globe Valves

- (1) Bolting at yoke to operator
- (2) Bolting at yoke to bonnet or bolting or clamping device at yoke to body.

Check Valves

- (1) Hanger Pin
- (2) Disc Nut
- (3) Internal Bolting

15.1.c - The functionally related non-pressure retaining parts shall be purchased from A/DV Co.'s approved Vendor for non-pressure retaining parts.



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15.2 The following are the requirements for the functionally related non-pressure retaining parts of the valves added to the P.O. after January 5, 1977:

15.2a - The stems for the gate and globe valves shall meet the requirements for the pressure retaining parts of the valve. This shall include implementation of the appropriate Quality Assurance Program, performance of NDE at a level comparable to that performed on the pressure retaining parts and submission of the required material test reports.

15.2b - All of the requirements listed above in paragraph 15.1.

15.3 Applicability:

15.3a - The requirements of paragraph 15.1 are applicable to the following items: 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 6.7, 6.8, 16.1, 16.2, 21.1, 21.2, 21.3, 21.4, 22.1, 22.2, 22.3 & 22.4.

15.3b - The requirements of paragraph 15.2 are applicable to the following items: 23.1, 24.1, 25.1, 26.1, 26.2, 23.2

15.3c Paragraphs 15.1a, 15.1b, 15.1c, 15.2, 15.2a, are applicable to all valves purchased on this P.O. after January 5, 1977

16.0 The following supplements and clarifies paragraph 9.0 of Specification 8031-P-350: Seat leakage test for actuated globe valves may be performed at 110 percent of the differential pressure as listed on the Valve Data Sheet (pressure applied under the disc).

17.0 The following supplements Specification 8031-P-350, paragraph 4.7.3. Stellite #156 is an acceptable hard surfacing material.



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NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
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18.0 The following supplements Specification 8031-P-350, paragraph 5.3.3(a). The use of A-106 Gr. B pipe for the interconnecting piping between the solenoid valve and the air operator is acceptable. This note is applicable to items 11.1, 11.2, 14.1 & 14.2 on Atwood & Morrill's P.O. 8031-P-104A.

19.0 Special Wiring Requirements for air operated actuators and solenoids.

19.1 No wire splices, whether crimp type or wire nuts, are acceptable. All electrical devices shall have leads of sufficient length to extend to terminal blocks.

19.2 Terminal blocks shall be Buchanan 2B100 series, with white marking strips.

19.3 Other details shall conform to the requirements of Specification 8031-P-354, para. 6.3 as applicable.

19.4 Requirements of Special Note 19 apply only to valves purchased after January 1, 1980.

20. Value operability tests will be performed (per attachments 3+4) on the following valves:
 P.104BC items 1.4, 3.10, 3.26, 4.2, 4.28
 P104CC items 5.8, 5.10, 6.8, 21.4, 22.4

21. Items 22.1 - 22.4 are supplied with strengthened yokes and ring clamps (item 30.1)



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
		<u>MATERIAL: NUCLEAR VALVES</u>		\$	\$
A	1 Lot	Drawings and data as required by form(s) G-321-C. The documentation requirements set forth herein shall be satisfied and provided with each shipment as specified. Failure to do so will render the shipment incomplete and payment will be adjusted accordingly.			Included in Itemized Prices Below
B	1 Lot	Seller shall furnish to the Expediter, shown on Page 1 of the Purchase Order, not later than _____, a complete schedule, forecasting engineering; material and/or sub-assembly acquisition; fabrication and/or labor; final assembly; testing, if any, and shipping date(s). In addition, Seller shall furnish a progress report to the Expediter every two weeks, in sufficient detail to allow a realistic evaluation of all phases toward Purchase Order completion.			
C	1 Lot	Parts lists required shall contain the name and order number of every part for the equipment and its auxiliaries including drawings in sufficient detail to locate and identify each part. In addition, where parts are manufactured by other than the Seller, the name of the original manufacturer and his part number shall be matched with the Sellers number on the part lists.			
D		<u>VALVE IDENTIFICATION</u> Valves are identified by a number consisting of: (1) nominal size, (2) materials class, (3) type, (5) operator type and number (if any), and (4) exception letters signifying unique features or requirements. For example: $\frac{6''}{(1)} - \frac{HBD}{(2)} - \frac{GT}{(3)} - \frac{A}{(4)} - \frac{MO-18-23}{(5)}$			
		The letters in components 2, 3, and 4 have the following meanings: A. <u>Material Class</u> (2) First letter (Primary Pressure Rating - unless otherwise noted all ratings are in accordance with ANSI B16.5)			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
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A - specific pressure @	G - 300#
specific temperature	H - 150#
B - 2500#	J - 125# ANSI B16.1
C - 1500#	K - 175# WOG, UL, Inc.
D - 900#	L - 250# ANSI B16.1
E - 600#	X - Gravity rating

Other pressure ratings:

M - 200# (Mfr's rating)	R - 75# (Mfr's rating)
N - 150# WOG	S - 50# WOG
P - 100# (Mfr's rating)	T - 25# AWWA (or Mfr's rating)

Second letter (Materials)

A - Alloy steel	H - Cast Iron
B - Carbon steel	L - Carbon steel - impact tested
C - Austenitic steel	M - Cast iron - high silicon
D - Copper, brass, or bronze	
F - Carbon steel, - copper bearing	
G - Carbon steel - lined	

Third letter (Applicable Codes)

A - Nuclear Class 1	F - Nat'l Fire Protection Code
B - Nuclear Class 2	G - Nat'l Plumbing Code
C - Nuclear Class 3	H - ASME Boiler & Pressure Vessel Code, Sec. I, Power Boilers
D - Power Piping Code, ANSI B31.1.0	J - AWWA

B. Valve Type (3)

Ball	BL	Globe	GB
Butterfly	BF	Globe Stop Check	GCK
Check	CK	Plug	PL
Diaphragm	DIA	Stop Check	SCK
Gate	GT	Testable Check	TCK
		Wafer Check	WCK
		Wafer Butterfly	WBF



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
		C. <u>Exceptions (4)</u>			
A		Angle Valves			
B		Valve furnished with extension stem per Bechtel Dwg. SK-M-147 suitable for field mounting			
C		Check valve with manual test lever			
D		3-way plug valve			
E		Spring loaded, piston actuated			
F		Valve located inside drywell			
G		Valve equipped with hand actuator mounted at side			
H		Special stem packing for chlorine service			
J		Butterfly valve - expansion joint unit			
K		Valve for slurry service			
L		Corrosion resistant trim			
O		Special stem packing for oil service			
R		With brass or bronze trim			
S		With stainless steel trim			
T		Valves with chains			
U		Valves with extended stem			
ZS		Position indicator			
X		Use of MSS-SP-66 is permitted for design of Class 2 and 3 Nuclear Service valves when necessary to meet overpressure conditions expected to occur (see item description).			
N		Manual Valve located in Seismic Class I system.			

FURNISH THE FOLLOWING VALVES AND ACCESSORIES,
F.O.B. JOBSITE:

GATE VALVES - MOTOR OPERATED

- 1.0 CLASS DBA-GT, 900# ASME Sec III rating -
Nuclear Class 1
- 1.1 For Unit No. 1 -
- 1 Mark: 3" - DBA-GT-F-MO-41-1F016

Ends: Sch. **160 BW**

Exception 'F': Valve located inside drywell.
For thermal transient data, refer to Table I,
Appendix 'B' of Spec. 8031-P-350
Valve Data Sheet No. 3.



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
1.2		For Unit No. 2 -			
	1	Mark: 3" - DBA-GT-F-MO-41-2F016 Ends: Sch. 160 BW Exception 'F': See item 1.1 For thermal transient data, See item 1.1 Valve Data Sheet No. 3.			
1.3		For Unit No. 1 -			
	1	Mark: 3" - DBA-GT-MO-41-1F019 Ends: Sch. 160 BW For thermal transient data, see item 1.1 Valve Data Sheet No. 4.			
1.4		For Unit No. 2 -			
	1	Mark: 3" - DBA-GT-MO-41-2F019 Ends: Sch. 160 BW For thermal transient data, see item 1.1 Valve Data Sheet No. 4.			
1.5		Deleted			
1.6		Deleted			
1.7		Deleted			
1.8		Deleted			
1.9		Deleted			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
1.10		Deleted			
<u>GATE VALVES - MOTOR OPERATED</u>					
2.0		<u>CLASS EBA-GT, 600# ANSI - Nuclear Class 1</u>			
2.1		Deleted			
2.2		Deleted			
<u>GATE VALVES - MOTOR OPERATED</u>					
3.0		<u>CLASS DBB-GT, 900# - NUCLEAR CLASS 2</u>			
3.1		Deleted			
3.2		Deleted			
3.3		Deleted			
3.4		Deleted			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
3.5		Deleted		\$	\$
3.6		Deleted			
3.7		Deleted			
3.8		Deleted			
3.9		For Unit No. 1 -			
	2	Mark: 6" - DBB-GT-X-MO-49-1F013, 1F012 Ends: SCH 120 BW Exception "X": Refer to Appendix 3, Para. 7.2 of Design Specification 8031-P-104, Maximum Pressure and Temperature are listed on the Valve Data Sheets. Valve Data Sheets No. 5, 8			
3.10	2	For Unit No. 2 - Mark: 6" - DBB-GT-X-MO-49-2F013, 2F012 Ends: Sch. 120 BW Exception 'X': Same as for Item 3.9 Valve Data Sheet No. 5, 8			
3.11		Deleted			
3.12		Deleted			
3.13		For Unit No. 1 -			
	1	Mark: 3" - DBB-GT-MO-46-1F082 Ends: Sch. 160 BW Valve Data Sheet No. 12 1 Spare Valve			
3.14		For Unit No. 2 -			
	1	Mark: 3" - DBB-GT-MO-46-2F082 Ends: Sch. 160 BW Valve Data Sheet No. 12 1 Spare Valve			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
3.15		For Unit No. 1 -		\$	\$
	2	Mark: 16"-DBB-GT-X-MO-41-109A, B Ends: SCH 120 BW Exception 'X': Refer to Appendix 3, para. 7.2 of Design Specification 8031-P-104 Maximum pressure and temperature are 2132 psig and 459°F Valve Data Sheet No.: 9			
3.16		For Unit No. 2 -			
	2	Mark: 16"-DBB-GT-X-MO-41-209A, B Ends: SCH 120 BW Exception 'X': Same as item 3.15 Valve Data Sheet No.: 9			
3.17		For Unit No. 1 -			
	1	Mark: 4"-DBB-GT-MO-55-1F071 Ends: SCH 120 BW Valve Data Sheet: 3			
3.18		For Unit No. 2 -			
	1	Mark: 4"-DBB-GT-MO-55-2F071 Ends: SCH 120 BW Valve Data Sheet: 3			
3.19		For Unit No. 1 -			
	1	Mark: 10"-DBB-GT-MO-55-1F011 Ends: SCH 120 BW Valve Data Sheet: 3 Note: This valve shipped to Peach Bottom for Mod. 381			
3.20		For Unit No. 2 -			
	1	Mark: 10"-DBB-GT-MO-55-2F011 Ends: SCH 120 BW Valve Data Sheet: 3 Note: This valve shipped to Peach Bottom for Mod 381			
3.21		For Unit No. 1 -			
	1	Mark: 12"-DBB-GT-MO-55-1F006 Ends: SCH 100 BW Valve Data Sheet No.: 2			



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ITEM NO.	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
3.22	For Unit No. 2 -		\$	\$
1	Mark: 12"-DBB-GT-MO-55-2F006 Ends: SCH 100 BW Valve Data Sheet No. 2			
3.23	For Unit No. 1 -			
1	Mark: 14"-DBB-GT-MO-55-1F007 Ends: SCH 100 BW Valve Data Sheet No. 2			
3.24	For Unit No. 2 -			
1	Mark: 14"-DBB-GT-MO-55-2F007 Ends: SCH 100 BW Valve Data Sheet No. 2			
3.25	For Unit No. 1 -			
1	Mark: 12"-DBB-GT-MO-55-1F001 Ends: SCH 80 BW Valve Data Sheet No. 1			
3.26	For Unit No. 2 -			
1	Mark: 12"-DBB-GT-MO-55-2F001 Ends: SCH 80 BW Valve Data Sheet No. 1			
3.27	For Unit No. 1			
1	Mark: 10"DBB-GT-MO-55-1F011 Ends: Sch. 120B.W. Valve Data Sheet No. 19			
3.28	For Unit No. 2			
1	Mark: 10"DBB-GT-MO-55-2F011 Ends: Sch 120B.W. Valve Data Sheet No. 19			
4.0	<u>GATE VALVES - MOTOR OPERATED</u> <u>CLASS DBB-GT & EBB-GT, 900# - Nuclear Class 2</u>			
4.1	For Unit No. 1 -			
2	Mark: 12" - DBB-GT-MO-52-1F004A, B Ends: Sch. 80 BW Valve Data Sheet No. 8			
4.2	For Unit No. 2 -			
2	Mark: 12" - DBB-GT-MO-52-2F004A, B Ends: Sch. 80 BW Valve Data Sheet No. 8			
4.3	Deleted			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
4.4		Deleted		\$	\$
4.5		Deleted			
4.6		Deleted			
4.7		Deleted			
4.8		Deleted			
4.9		Deleted			
4.10		Deleted			
1		Deleted			
4.12		Deleted			
4.13		Deleted			
4.14		Deleted			
4.15		Deleted			
4.16		Deleted			
4.17		Deleted			
4.18		Deleted			
4.19		Deleted			
4.20		Deleted			



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QTY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
4.21	Deleted			
4.22	Deleted			
4.23	For Unit No. 1			
2	Mark: 6"-DBB-GT - MO-01-108,109 Ends: Sch. 80 BW Valve Data Sheet No. 16			
4.24	For Unit No. 2			
2	Mark: 6"-DBB-GT - MO-01-208,209 Ends: Sch. 80 BW Valve Data Sheet No. 16			
4.25	For Unit No. 1			
1	Mark: 8"-DBB-GT - MO-01-111 Ends: Sch. 80 BW Valve Data Sheet No. 17			
4.26	For Unit No. 1			
1	Mark: 8"-DBB-GT - MO-55-1F105 Ends: Sch. 120 BW Valve Data Sheet No. 22			
4.27	For Unit No. 1			
1	Mark: 4" - EBB-GT-X-MO-01-150 Ends: Sch. 80 BW Exception "X": Refer to Appendix 3, para. 7.2 of Design Spec. 8031-P-104 Maximum pressure and temperature are 1337 ^{psig} and 582 ^{°F} . Valve Data Sheet No. 18			
4.28	For Unit No. 2			
1	Mark: 4" - EBB-GT-X-MO-01-250 Ends: Sch. 80 BW Valve Data Sheet No. 18 EXCEPT. "X": SAME AS ITEM 4.27			
5.0	<u>GLOBE VALVES - MOTOR OPERATED -</u> <u>CLASS DBB-GB, 900# ANSI - Nuclear Class 2</u>			
5.1	Deleted			
5.2	Deleted			
5.3	Deleted			
5.4	Deleted			
5.5	Deleted			
5.6	Deleted			

Note: This was formerly
Mark: 8"-DBB-GT-MO-01-211



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
5.7		For Unit No. 1 -			
	1	Mark: 6"-DBB-GB-MO-50-1F045 Ends: SCH 80 BW Valve Data Sheet No. 5			
5.8	1	For Unit No. 2 - Mark: 6"-DBB-GB-MO-50-2F045 Ends: SCH 80 BW Valve Data Sheet No. 5			
5.9		For Unit No. 1 -			
	1	Mark: 10"-DBB-GB-MO-55-1F008 Ends: SCH 120 BW Valve Data Sheet No. 2			
5.10		For Unit No. 2 -			
	1	Mark: 10"-DBB-GB-MO-55-2F008 Ends: SCH 120 BW Valve Data Sheet No. 2			
5.11		For Unit No. 1 -			
	1	Mark: 4"-DBB-GB-MO-49-1F022 Ends: Sch. 120 BW Valve Data Sheet No. 1			
5.12		For Unit No. 2 -			
	1	Mark: 4"-DBB-GB-MO-49-2F022 Ends: Sch 120 BW Valve Data Sheet No. 1			
5.13		Deleted			
5.14		Deleted			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
6.0		<u>CLASS EBB-GB, 600# ANSI - MOTOR OPERATED - Nuclear Class 2</u>			
6.1		Deleted			
6.2		Deleted			
6.3		Deleted			
6.4		Deleted			
6.5		Deleted			
6.6		Deleted			
6.7		For Unit No. 1			
	2	Mark: 10"-EBB-GB-X-MO-51-1F052A, B Ends: Sch. 80 BW Exception 'X': See page G. Valve Data Sheet No. 12			
6.8		For Unit No. 2 -			
	2	Mark: 10"-EBB-GB-X-MO-51-2F052A, B Ends: Sch. 80 BW Exception 'X': See page G. VALVE DATA SHEET NO. 12			
6.9		Deleted			
6.10		Deleted			
6.11		Deleted			
6.12		Deleted			
6.13		Deleted			
6.14		Deleted			
		<u>CHECK VALVES</u>			
7.0		<u>CLASS DBA-CK, 900# - Nuclear Class I</u>			
7.1		For Unit No. 1 -			
	1	Mark: 3"-DBA-CK-F Ends: Sch. 80 BW Exception 'F': See Item 1.1			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
		For thermal transient data, refer to Table VIII, Appendix 'B' of Spec. 8031-P-350 Valve Data Sheet No. 10			
7.2		For Unit No. 2 -			
	1	Mark: 3"-DBA-CK-F			
		Ends: Sch. 80 BW			
		Exception 'F': See Item 1.1			
		For thermal transient data, see Item 7.1			
		Valve Data Sheet No. 10			
7.3		Deleted			
7.4		Deleted			
8.0		<u>CLASS DBB-CK, 900# ANSI - Nuclear Class 2</u>			
8.1		Deleted			
8.2		Deleted			
8.3		For Unit No. 1 -			
	4	Mark: 4"-DBB-CK-49-1F023; 4"-DBB-CK-55-1F046			
		Ends: CK-49-1F023 - SCH. 120 BW			
		CK-55-1F046 - SCH. 80 BW			
8.4		For Unit No. 2 -			
	2	Mark: 4"-DBB-CK-49-2F023; 4"-DBB-CK-55-2F046			
		Ends: CK-49-2F023 - SCH. 120 BW			
		CK-55-2F046 - SCH. 80 BW			
8.5		For Unit No. 1 -			
	1	Mark: 10"-DBB-CK			
		Ends: SCH 120 BW			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
8.6	1	For Unit No. 2 - Mark: 10"-DBB-CK Ends: Sch. 120 BW			
8.7	1	Mark: 8"-DBB-CK Ends: Sch. 120 BW			

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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
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STOPCHECK VALVES - MOTOR OPERATED9.0 CLASS DBB-S.CK, 900# - Nuclear Class 2

9.1 For Unit No. 1 -

2 Mark: 24"-DBB-S.CK-X-MO-41-1F032 A&B

Ends: Sch. 120 **BW**

Exception 'X': Refer to 7.2, Appendix 3 of

Design Specification No. 8031-P-104.

Maximum pressure and temperature are

2132 psig and 459°F.

Valve Data Sheet No. 9

For Unit No. 2 -

2 Mark: 24"-DBB-S.CK-X-MO-41-2F032 A&B

Ends: Sch. 120 **BW**

Exception 'X': Same as Item 9.1

Valve Data Sheet No. 9

9.3 Deleted

9.4 Deleted

GATE VALVES - MANUALLY OPERATED10.0 CLASS DBA-GT, 900# - Nuclear Class 1

10.1 Deleted

10.2 Deleted

POWER ASSIST CHECK VALVES - AIR OPERATED0 CLASS DBA-CK, 900# rating - Nuclear Class 1

1.1 For Unit No. 1 -

1 Mark: 3"-DBA-CK-AO-46-1F121



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
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Ends: Sch. 80 BW
 For thermal transient data, refer to Table VIII, Appendix 'B' of Spec. 8031-P-350
 Valve Data Sheet No. 11
 1 Spare Valve

11.2 For Unit No. 2 -

1 Mark: 3"-DBA-CK-AO-46-2F121

Ends: Sch. 80 BW
 For thermal transient data, refer to Item 11.1
 Valve Data Sheet No. 11
 1 Spare Valve

CHECK VALVES

12.0 CLASS EBB-CK, 600# rating - Nuclear Class 2

12.1 Deleted
 12.2 Deleted
 12.3 Deleted
 12.4 Deleted
 12.5 Deleted
 12.6 Deleted
 12.7 1 Mark: 12"-EBB-CK
 Ends: Sch 80 BW

GATE VALVES - AIR OPERATED

13.0 CLASS EBB-GT, 600# rating - Nuclear Class 2

13.1 Deleted

13.2 Deleted

13.3 Deleted

13.4 Deleted

13.5 Deleted

13.6 Deleted



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
<u>STOP CHECK VALVES</u>					
14.0		<u>CLASS DBB-SCK, 900# AIR OPERATED - Nuclear Class 2</u>			
14.1		For Unit No. 1 -			
	1	Mark: 4"-DBB-SCK-X-AO-44-1F039 Ends: SCH 120 BW Exception 'X': Refer to Appendix 3, Para. 7.2 of Design Specification 8031-P-104. Maximum pressure and temperature are 2132 psig and 459°F. Valve Data Sheet No. 13			
14.2		For Unit No. 2 -			
	1	Mark: 4"-DBB-SCK-X-AO-44-2F039 Ends: SCH 120 BW Exception 'X': Same as item 14.1 Valve Data Sheet No. 13			
<u>GLOBE VALVES</u>					
15.0		<u>CLASS DBC-GB, 900# ANSI - AIR OPERATED - Nuclear Class 3</u>			
15.1		DELETED			
15.2		DELETED			
16.0		<u>CLASS DBC-GB, 900# ANSI - MOTOR OPERATED - Nuclear Class 3</u>			
16.1		For Unit No. 1 -			
	1	Mark: 4"-DBC-GB-MO-44-1F031 Ends: SCH 80 BW Valve Data Sheet No. 14			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
16.2		For Unit No. 2 -			
	1	Mark: 4"-DBC-GB-MO-44-2F031 Ends: SCH 80 BW Valve Data Sheet No. 14			
<u>GATE VALVES</u>					
17.0		<u>CLASS DBC-GT, 900# ANSI - MOTOR OPERATED - Nuclear Class 3</u>			
17.1		For Unit No. 1 -			
	2	Mark: 4"-DBC-GT-MO-44-1F034 & 1F035 Ends: SCH 80 BW Valve Data Sheet No. 14			
17.2		For Unit No. 2 -			
	2	Mark: 4"-DBC-GT-MO-44-2F034 & 2F035 Ends: SCH 80 BW Valve Data Sheet No. 14			
18.0		<u>CLASS EBC-GT, 600# ANSI - AIR OPERATED - Nuclear Class 3</u>			
18.1		For Unit No. 1 -			
	1	Mark: 4"-EBC-GT-AO-69-145 Ends: SCH 80 BW Valve Data Sheet No. 15 1 Spare Valve			
18.2		For Unit No. 2 -			
	1	Mark: 4"-EBC-GT-AO-69-245 Ends: SCH 80 BW Valve Data Sheet No. 15 1 Spare Valve			
19.0		<u>CLASS EBC-GT, 600# ANSI - MOTOR OPERATED - Nuclear Class 3</u>			
19.1		For Unit No. 1 -			
	1	Mark: 6"-EBC-GT-MO-69-146 Ends: SCH 80 BW Valve Data Sheet No. 16 1 Spare Valve			



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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
19.2		For Unit No. 2 -		\$	\$
	1	Mark: 6"-EBC-GT-MO-69-246 Ends: SCH 80 BW Valve Data Sheet No. 16 1 Spare Valve			
20.0		<u>CLASS EBC-GT, 600# ANSI - MANUAL VALVE - Nuclear Class 3</u>			
20.1		For Unit No. 1			
	1	Mark: 6"-EBC-GT Ends: SCH 80 BW			
20.2		For Unit No. 2 -			
	1	Mark: 6"-EBC-GT Ends: SCH 80 BW			
		<u>ISOLATION VALVES - MOTOR OPERATED</u>			
21.0		<u>Class EBA-GB, 600# ASME Rating Carbon Steel Nuclear Class 1</u>			
21.1		For Unit No. 1			
	1	Mark: 10"-EBA-GB-F-MO-55-1F002 Ends: Sch. 80 BW Exception "F" - Valve located inside drywell see para. 3.6 of Appendix 3 of Design Spec. for environmental conditions. For thermal transient data, refer to Table I, Appendix 'B' of Spec. 8031-P-350. Drain required - see para. 16.0 of Appendix 3 of the Design Specification 8031-P-104 Valve Data Sheet No. 17			
21.2		For Unit No. 2			
	1	Mark: 10"-EBA-GB-F-MO-55-2F002 Ends: Sch. 80 BW Exception "F" - See Item 21.1. For thermal transient data - see Item 21.1 Drain required - See Item 21.1 Valve Data Sheet No. 17			
					NOTE: SEE ITEM 20.1 FOR REPLACEMENT OPERATOR FOR THIS VALVE
1.3		For Unit No. 1			
	1	Mark: 10"-EBA-GB-MO-55-1F003 Ends: Sch. 80 BW			



PURCHASE ORDER NO.

REQUISITION NO.

8031-P-104	REV 7

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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
		For thermal transient data - see Item 21.1 Drain required - See Item 21.1 Valve Data Sheet No. 17		\$	\$
21.4		For Unit No. 2			
	1	Mark: 10"-EBA-GB-MO-55-2F003 Ends: Sch. 80 BW For thermal transient data - see Item 21.1 Drain required - see Item 21.1 Valve Data Sheet No. 17			
22.0		<u>ISOLATION VALVES - MOTOR OPERATED</u> <u>CLASS DBA-GB, 900# ASME RATING, CARBON STEEL</u> <u>NUCLEAR CLASS 1</u>			
22.1		For Unit No. 1			
	1	Mark: 3"-DBA-GB-F-MO-49-1F007 Ends: Sch. 160 BW Exception 'F' - See Item 21.1 For thermal transient data, see Item 21.1 Valve Data Sheet No. 18 (<i>Drain required - see item 21.1</i>)			
22.2		For Unit No. 2			
	1	Mark: 3"-DBA-GB-F-MO-49-2F007 Ends: Sch. 160 BW Exception 'F' - See Item 21.1-For thermal transient data see Item 21.1 Drain required - see Item 21.1 Valve Data Sheet No. 18			
22.3		For Unit No. 1			
	1	Mark: 3"-DBA-GB-MO-49-1F008 Ends: Sch. 160 BW For thermal transient data - See Item 21.1 Drain required - See Item 21.1 Valve Data Sheet No. 18			
22.4		For Unit No. 2			
	1	Mark: 3"-DBA-GB-MO-49-2F008 Ends: Sch. 160 BW For Thermal transient data - See Item 21.1 Drain required - see Item 21.1 Valve Data Sheet No. 18			



PURCHASE ORDER NO.

REQUISITION NO.

8031-P-104	RFV 15

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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
		<u>GLOBE VALVES</u>			
23.0		<u>CLASS DBA-GB, 900# RATING - MANUAL</u> <u>NUCLEAR CLASS 1</u>			
23.1		For Unit No. 1 & 2			
	4	Mark: 4" DBA-GB-F-N-41-1017 & 2017 Ends: Sch. 80 B.W. 4" DBA-GB-N-41-1016 & 2016 Ends: Sch. 120 B.W. Valve Data Sheet No. 20			
		Exception "F": Valve located inside drywell, for thermal transient data refer to Table III, Appendix "B" of Spec. 8031-P-350. Exception "N": Valve located in Seismic I system, see para 2.3.3 of Spec. 8031-P-350			
23.2		For Unit No. 1 and 2			
	2	Mark: 3" DBA-GB-F-N-41-1026 2026 Ends: Sch 160B.W. Valve Data Sheet No. 20 Exception "F" - Valve located in drywell, thermal transient data Exception "N" - see Item 23.1			per table I, App B of P-330
24.0		<u>CLASS DBB-GB, 900# RATING - MANUAL</u> <u>NUCLEAR CLASS 2</u>			
24.1		For Unit No. 1 & 2			
	2	Mark: 4" DBB-GB Ends: Sch. 120 B.W.			
25.0		<u>CLASS DBC-GB, 900# RATING - MANUAL</u> <u>NUCLEAR CLASS 3</u>			
25.1		For Unit No. 1 & 2			
	2	Mark: 3" DBC-GB Ends: Sch. 160 B.W.			
26.0		<u>CLASS EBC-GB, 600# RATING - MANUAL</u> <u>NUCLEAR CLASS 3</u>			
26.1		For Unit No. 1 & 2			
	2	Mark: 5" EBC-GB Ends: Sch. 80 B.W.			
26.2		For Unit No. 1 & 2			
	2	Mark: 4" EBC-GB Ends: Sch. 80 B.W.			



PURCHASE ORDER NO.

REQUISITION NO.

8031-P-104

REV.

22

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ITEM NO.	QUANTITY	DESCRIPTION	CODE OR EQUIP. NO.	UNIT PRICE	EXTENSION
<u>GATE VALVES</u>					
27.0		<u>CLASS DBC-GT, 900# RATING, MOTOR OPERATED, NUCLEAR CLASS 3</u>			
27.1		For Unit No. 1			
	2	Mark: 3"-DBC-GT-MO-41-142 and -143 Ends: Sch. 160 B.W. Valve Data Sheet No.21			
27.2		For Unit No.2			
	2	Mark: 3"-DBC-GT-MO-41-242 and -243 Ends: Sch. 160 B.W. Valve Data Sheet No. 21			
28.0		<u>REPLACEMENT MOTOR OPERATOR</u>			
28.1	1	Limitorque SMB-4-150 Motor Operator for Anchor/Darling valve EG179-8-2 furnished on Item 21.2 of this requisition.			
		Note: All cost for this replacement is to be charged to backcharge No. 66/214			
29.0		<u>Gate Values - Motor Operated</u> <u>Class DBB-GT 900# ASME</u> <u>Nuclear Class 2</u>			
29.1		Deleted			
30.0		<u>Replacement Yokes</u>			
30.1	✓ 4	Replacement yokes and ring clamps for items 22.1-22.4			

REV. DESCRIPTION	ENG	DR	CHK	SUPV	MATL	APPROVALS	DATE
							MO-55-1F002
							MO-55-2F002
							MO-55-1F001
							MO-55-2F001
							MO-49-1F022
							MO-49-2F022
							VALVE NO.
							SERVICE
							TYPE
							LINE OR EQUIPMENT REF.
							MOTOR RATED POWER
							SIZE
							COMMODITY
							DESIGN/MAX. PRESS. ^{PSIG}
							DESIGN/MAX. TEMP. ^{°F}
							FLOW MAX
							VALVE RATING
							TYPE ENDS/RATING
							BODY MATERIAL
							TRIM MATERIAL
							SEAT FACINGS
							PACKING
							TYPE BONNET
							TYPE OF SEATS
							TYPE OF DISC
							BYPASS SIZE & TYPE
							HANDWHEEL PULL-BREAKAWAY
							ACT. OP. DIFF. PRESS. (Alloy)
							PORT DIAMETER
							PRESS. DROP (PSI)
							VELOCITY (FPS)
							(2) OPERATOR CLASS
							MOTOR OPER (TYPE/SIZE/SPD)
							OPER. SPEED FT/MIN/HP
							TIME TO OPEN MAX
							TIME TO CLOSE MAX
							FULL LOAD CURRENT
							STALLED ROTOR CURRENT
							OPERATOR INSULATION CLASS
							COST - EACH VALVE
							BYPASS
							FURN & INSTALL LIMIT SWS.
							TESTS - MAGNAFLUX
							TESTS - X-RAY
							NO. REQUIRED UNIT1 / UNIT2
							TOTAL COST
							MANUFACTURER
							MODEL OR FIG. NO.
							VENDOR
							P/O (8 ITEM) NO.
							FOREIGN PRINT NO.
							WELD END DWG. REFERENCE
							P & I DIAGRAM REF.
							LOCATION DWG. REF.
							(1) SEISMIC ITEM: (YES)(NO)
							REMARKS

2 REVISED AS MARKED
 1 REVISED AS MARKED
 6 REVISED AS MARKED

VALVE DATA SHEET
MOTOR OPERATED



PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION UNITS 1 & 2

JOB No
Attachment to
M/R No.
8031-P-104
SHEET 1 OF 22

REV.
6

DATE	MO-55-1F007			MO-55-1F008			MO-55-1F006		
	MO-55-2F007			MO-55-2F008			MO-55-2F006		
VALVE NO.	HPCI PUMP DISCH.			HPCI PUMP TEST			HPCI PUMP DISCH.		
SERVICE TYPE	GATE			GLOBE			GATE		
LINE OR EQUIPMENT REF.	EBB-129,229			EBB-134,234			EBB-129,229		
MOTOR RATED POWER	240 V D.C.			240 V D.C.			240 V D.C.		
SIZE	14" x 12" x 14"			10"			12"		
COMMODITY	CONDENSATE			CONDENSATE			CONDENSATE		
DESIGN/MAX. PRESS.	1396/1625			1396/1625			1396/1625		
DESIGN/MAX. TEMP.	170/170			170/170			170/170		
FLOW	5600 GPM			5600 GPM			5600 GPM		
VALVE RATING	900# ANSI			900# ANSI			900# ANSI		
TYPE ENDS/RATING	B.W. Sch. 100			B.W. Sch. 120			B.W. Sch. 100		
BODY MATERIAL	ASME SA-216 GR.			W.C.B. OR SA-105			GR. II		
TRIM MATERIAL	STELLITE			STELLITE			STELLITE		
SEAT FACINGS	CRANE 187-I			CRANE 187-I			CRANE 187-I		
PACKING	PRESSURE SEAL			PRESSURE SEAL			PRESSURE SEAL		
TYPE BONNET	INTEGRAL OR			RENEWABLE			FLEXIBLE		
TYPE OF SEATS	FLEXIBLE			PLUG			FLEXIBLE		
TYPE OF DISC	BYPASS SIZE & TYPE								
HANDWHEEL PULL-BREAKAWAY	ACT. OP. DIFF. PRESS. (Max)			1625 PSI			1000 PSI		
PORT DIAMETER									
PRESS. DROP (PSI)									
VELOCITY (FPS)									
(2) OPERATOR CLASS	I (IEEE STD. 3-3)								
MOTOR OPER (TYPE/SIZE/SPD)									
OPER. SPEED FT/MIN/HP									
TIME TO OPEN	20 SEC			20 SEC.			20 SEC		
TIME TO CLOSE	20 SEC			20 SEC.			20 SEC		
FULL LOAD CURRENT									
STALLED ROTOR CURRENT									
OPERATOR INSULAT ON CLASS	H			H			H		
COST - EACH VALVE									
BYPASS									
FURN & INSTALL LIMIT SWS.									
TESTS - MAGNAFLUX									
TESTS - X-RAY									
NO. REQUIRED	UNIT 1 / UNIT 2			1 / 1			1 / 1		
TOTAL COST									
MANUFACTURER									
MODEL OR FIG. NO.									
VENDOR									
P/O (8 ITEM) NO.	P-104/3,23,324			P-104/5,9,5,10			P-104/3,21,3,22		
FOREIGN PRINT NO.									
WELD END DWG. REFERENCE	SPEC 8031-P-300			SHEETS 75 & 72					
P & I DIAGRAM REF.	M-55			M-55			M-55		
LOCATION DWG. REF.									
(1) SEISMIC ITEM: (YES) (NO)	YES			YES			YES		
REMARKS	(1) REFER TO 2.3.3 OF SPEC. 8031-P-350 FOR SEISMIC REQ'TS.								
	(2) REFER TO SPEC 8031-G-11								

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 6 REVISED AS MARKED
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VALVE DATA SHEET
MOTOR OPERATED



PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION UNITS 1 & 2

JOB No	Attachment to M/R No. 8031-P-104	REV. 9
SHEET	2	OF 22

15 REVISED AS MARKED
 7 REVISED AS MARKED
 6 REVISED AS MARKED
 4-14-58
 M-323-E

DATE	APPROVALS	SUPV	MATL	CHK	OR	ENG	DESCRIPTION
7-15-75							
1-1-78							
VALVE NO.	MO-55-1FO11 MO-55-2FO11	MO-55-1FO71 MO-55-2FO71	MO-41-1FO16 MO-41-2FO16				
SERVICE TYPE	HPCI PUMP TEST TO COND. TANK GATE	HPCI PUMP TEST LINETO SUPP. POOL GATE	MAIN STEAM LINE DRAIN (INSIDE DR/WL) GATE				
LINE OR EQUIPMENT REF.	EBB-134,234	EBB-134,234	DBAL-105,205				
MOTOR RATING (POWER)	460V, 3Ø, 60HZ	240 VDC	460V, 3Ø, 60HZ				
SIZE	10X8X10"	4"	3"				
COMMODITY	CONDENSATE	CONDENSATE	MAIN STM/CONDENSATE				
DESIGN/MAX. PRESS. PSIG	1396/1625	1396/1625	1250/1337				
DESIGN/MAX. TEMP. °F	170/170	170/170	575/582				
FLOW	MAX 5600 GPM	5600 GPM	50 GPM				
VALVE RATING	900 # ANSI	900 # ANSI	900 # ASME				
TYPE ENDS/RATING	B.W. Sch 120	B.W. Sch 120	B.W. Sch 80				
BODY MATERIAL	ASME SA-216 Gr. WCB	OR SA-105 Gr. II					
TRIM MATERIAL							
SEAT FACINGS	STELLITE						
PACKING	CRANE 187-I						
TYPE BONNET	PRESSURE SEAL						
TYPE OF SEATS	INTEGRAL OR RENEWABLE						
TYPE OF DISC	FLEXIBLE WEDGE		SOLID WEDGE				
BYPASS SIZE & TYPE							
HANDWHEEL PULL-BREAKAWAY ACT. OP. ... L DIFF. PRESS. (Max)	1000 PSI	50 PSI	1250 PSI				
PORT DIAMETER							
PRESS. DROP (PSI)							
VELOCITY (FPS)							
(2) OPERATOR CLASS		I (IEEE STD. 323)					
MOTOR OPER (TYPE/SIZE/SPD)							
OPER. SPEED FT/MIN/MP	STANDARD	STANDARD	STANDARD				
TIME TO OPEN							
TIME TO CLOSE							
FULL LOAD CURRENT							
STALLED ROTOR CURRENT							
OPERATOR INSULATION CLASS	H	H	H				
COST - EACH VALVE							
BYPASS							
FURN & INSTALL LIMIT SWS.							
TESTS - MAG-AFLUX							
TESTS - X-RAY							
NO. REQUIRED Unit 1 / Unit 2	1 / 1	1 / 1	1 / 1				
TOTAL COST							
MANUFACTURER							
MODEL OR FIG. NO.							
VENDOR							
P/O (8 ITEM) NO.	P-104/B.P. 320	P-104/3.17, 3.18	P-104/1.1, 1.2				
FOREIGN PRINT NO.							
WELD END DWG. REFERENCE	8031-P-300 sheets 75 & 72						
P & I DIAGRAM REF.	M-55	M-55	M-41				
LOCATION DWG. REF.							
(1) SEISMIC ITEM: (YES) (NO)	YES	YES	YES				
REMARKS	(1) REFER TO 2.3 OF SPEC. 8031-P-350 FOR SEISMIC REQ'TS (2) REFER TO SPEC. 8031-G-11						




VALVE DATA SHEET
 MOTOR OPERATED
 Limerick Generating Station
 Units 1 & 2
 Philadelphia Electric Company

JOB No 8031
 Attachment to Re-
 quisition No. 8031
 P-104
 SHEET 3 OF 22
 REV. 15

15-75
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 DATE
 APPROVALS
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 4-14-56
 POWER DIVISION
 ENGINEERING

VALVE NO.	MO-41-1F019	MO-49-1F007	MO-49-1F008
VALVE NO.	MO-41-2F019	MO-49-2F007	MO-49-2F008
SERVICE	MAINSTEAM LINE DRAIN	RCIC TURB STEAM SUPPLY (INSIDE DRAIN)	RCIC TURB STEAM SUPPLY
TYPE	GATE	GATE	GATE
LINE OR EQUIPMENT REF.	DBA-105,205	DBA1-107,207	DBA1-107,207
MOTOR RATING (POWER)	460V, 3 ϕ , 60HZ	460V, 3 ϕ , 60HZ	240V, DC
SIZE	3"	3"	3"
COMMODITY	MAIN STM / CONDENSATE	MAIN STEAM	MAIN STEAM
DESIGN/MAX. PRESS. (PSIG)	1250 / 1337	1250 / 1337	1250 / 1337
DESIGN/MAX. TEMP. (OF)	575 / 582	575 / 582	575 / 582
FLOW	50 GPM	38,000 lbs/hr	38,000 lbs/hr
VALVE RATING	900# ASME III	900# ANSI	900# ANSI
TYPE ENDS/RATING	B.W. SCH 160	B.W. SCH 80	B.W. SCH 80
BODY MATERIAL	ASME SA-216 GR. WCB	GR SA-105 GR II	
TRIM MATERIAL			
SEAT FACINGS	STELLITE		
PACKING	CRANE 187-2		
TYPE BONNET	PRESSURE SEAL		
TYPE OF SEATS	INTEGRAL OR RENEWABLE		
TYPE OF DISC	SOLID WEDGE		
BYPASS SIZE & TYPE			
HANDWHEEL PULL-BREAKAWAY ACT. QP-DIFF. PRESS. (max)	1250 PSI	1250 PSI	1250 PSI
PORT DIAMETER			
PRESS. DROP (PSI)			
VELOCITY (FPS)			
(2) OPERATOR CLASS	I (IEEE STD 323)		
MOTOR OPER (TYPE/SIZE/SPD)			
OPER. SPEED FT/MIN/W	STANDARD	STANDARD	STANDARD
TIME TO OPEN			
TIME TO CLOSE			
FULL LOAD CURRENT			
STALLED ROTOR CURRENT			
OPERATOR INSULATION CLASS	H		
COST - EACH VALVE			
BYPASS			
FURN & INSTALL LIMIT SWS.			
TESTS - MAGNAFLUX			
TESTS - X-RAY			
NO. REQUIRED Unit 1 / Unit 2	1 / 1	1 / 1	1 / 1
TOTAL COST			
MANUFACTURER			
MODEL OR FIG. NO.			
VENDOR			
P/O (8 ITEM) NO.	P-104/13,14	P-104/13,16	P-104/17,18
FOREIGN PRINT NO.			
WELD END DWG. REFERENCE	8031-P-300 sheets 75 & 72		
P & I DIAGRAM REF.	M-41	M-49	M-49
LOCATION DWG. REF.			
(1) SEISMIC ITEM: (YES) (NO)	YES	YES	YES
REMARKS	(1) REFER TO 2.3.3 OF SPEC. 8031-P-350 FOR SEISMIC REQ'TS (2) REFER TO SPEC 8031-G-11		



POWER DIVISION
ENGINEERING

VALVE DATA SHEET
MOTOR OPERATED

Limerick Generating Station
Units 1 & 2
Philadelphia Electric Company

JOB No 8031

Attachment to Re-
quisition No. 8031
P-104


SHEET 4 OF 22

REV.

7


1-10-74
 8-14-72
 1-7-74
 DATE
 APPROVALS
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 DESCRIPTION
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VALVE NO.	MO-50-1FO45 MO-50-2FO45	MO-49-1FO12 MO-49-2FO12	MO-49-1FO13 MO-49-2FO13
SERVICE TYPE	RCIC TURB STEAM SUPPLY GLOBE	RCIC PUMP DISCHARGE GATE	RCIC PUMP DISCHARGE GATE
LINE OR EQUIPMENT REF.	EBB-109,209	DBB1-101,201	DBB-101,201
MOTOR RATING (POWER)	240V DC	240V DC	240V DC
SIZE	6"	6"	6"
COMMODITY	MAIN STEAM	CONDENSATE	CONDENSATE
DESIGN/MAX. PRESS.	1115/1337	1750/2100	1177/12132
DESIGN/MAX. TEMP.	558/582	459/459	459/459
FLOW	33,000 lb/hr	616 GPM	600 GPM
VALVE RATING	900# ANSI	900# ANSI	SEE ITEM DESCRIPTION
TYPE ENDS/RATING	B.W. SCH 160	B.W. SCH 120	B.W. SCH 120
BODY MATERIAL	ASME SA-216 GR. WCB	SA-105 GR. II	
TRIM MATERIAL			
SEAT FACINGS	STELLITE		
PACKING	CRANE 187-I		
TYPE BONNET	PRESSURE SEAL	PRESSURE SEAL	
TYPE OF SEATS	INTEGRAL OR	RENEWABLE	
TYPE OF DISC	PLUG	FLEXIBLE WEDGE	
BYPASS SIZE & TYPE			
HANDWHEEL PULL-BREAKAWAY			
ACT. OP. DIFF. PRESS (max)	1337 PSI	1500 PSI	1500 PSI
PORT DIAMETER			
PRESS. DROP (PSI)			
VELOCITY (FPS)			
(2) OPERATOR CLASS	T (IEEE STD 323)		1 (IEEE STD 323)
MOTOR OPER (TYPE/SIZE/SPD)			
OPER. SPEED FT/MIN/HP			
TIME TO OPEN MAX	15 SEC	15 SEC	15 SEC
TIME TO CLOSE MAX	15 SEC	15 SEC	15 SEC
FULL LOAD CURRENT			
STALLED ROTOR CURRENT			
OPERATOR INSULATION CLASS	H		H
COST - EACH VALVE			
BYPASS			
FURN & INSTALL LIMIT SWS.			
TESTS - MAGNAFLUX			
TESTS - X-RAY			
NO. REQUIRED Unit 1/Unit 2	1 / 1	1 / 1	1 / 1
TOTAL COST			
MANUFACTURER			
MODEL OR FIG. NO.			
VENDOR			
P/O (8 ITEM) NO.	P-104/5.3, 5.8	P-104/3.7, B.5	P-104/3.9, 3.10
FOREIGN PRINT NO.			
WELD END DWG. REFERENCE	8031-P-300 SHEETS 75 & 72		
P & I DIAGRAM REF.	M-50	M-49	M-49
LOCATION DWG. REF.			
(1) SEISMIC ITEM: (YES) (NO)	YES	YES	YES
REMARKS	(1) REFER TO 2.3.3 OF SPEC. 8031-P-350 FOR SEISMIC REQTS. (2) REFER TO SPEC 8031-G-11		

 POWER DIVISION ENGINEERING	VALVE DATA SHEET MOTOR OPERATED Limerick Generating Station Units 1 & 2 Philadelphia Electric Company	JOB No 8031 Attachment to Re- quisition No. 8031 P-104 SHEET 5 OF 22	REV. 6
	4-14-58		


DATE	VALVE NO.		
	8-14-72	MO-41-1F020	MO-44-1F031
1-7-74	MO-41-2F020	MO-44-2F031	MO-44-2F034
7-16-72	SERVICE		
	MAIN STEAM	FLOW ORIFICE	REACTOR WATER
	DRAIN/BYPASS	BY PASS	CLEAN UP TO COND'R
	GLOBE	GATE	GATE
	LINE OR EQUIPMENT REF.		
	EBB-105, 205	EBB-	EBB-7
	MOTOR RATING (POWER)		
	460V, 3 ϕ , 60HZ	460V, 3 ϕ , 60HZ	460V, 3 ϕ , 60HZ
	SIZE		
	3"	4"	4"
	COMMODITY		
	MAIN STEAM	REACTOR WATER	REACTOR WATER
	DESIGN/MAX. PRESS. PSIG		
	1115/1337	1320/1577	1320/1597
	DESIGN/MAX. TEMP. °F		
	582/582	150/140	150/140
	FLOW #/HR		
	60000#/HR	364 GPM	270 GPM
	VALVE RATING		
	SEE ITEM DESCRIPTION	600#ANSI	600#ANSI
	TYPE ENDS/RATING		
	B.W. SCH 160	B.W. SCH. 80	B.W. SCH 80
	BODY MATERIAL		
	ASME SA-216 GR. W.C.B	ASME SA-105 GR. II	ASME SA-105 GR. II
	TRIM MATERIAL		
	SEAT FACINGS		
	STELLITE	STELLITE	STELLITE
	PACKING		
	CRANE 187-I	CRANE 187-I	CRANE 187-I
	TYPE BONNET		
	PRESSURE SEAL	BOLTED	BOLTED
	TYPE OF SEATS		
	INTEGRAL OR RENEWABLE	FLEXIBLE WEDGE	FLEXIBLE WEDGE
	TYPE OF DISC		
	PLUG	FLEXIBLE WEDGE	FLEXIBLE WEDGE
	BYPASS SIZE & TYPE		
	HANDWHEEL PULL-BREAKAWAY		
	ACT. OP. DIFF. PRESS. (max)		
	1337 PSI	1220 PSI	1220 PSI
	PORT DIAMETER		
	PRESS. DROP (PSI)		
	VELOCITY (FPS)		
	(2) OPERATOR CLASS		
	I (IEEE STD 323)		
	MOTOR OPER (TYPE/SIZE/SPD)		
	OPER. SPEED FT/MIN/HP		
	STANDARD	STANDARD	STANDARD
	TIME TO OPEN		
	TIME TO CLOSE		
	FULL LOAD CURRENT		
	STALLED ROTOR CURRENT		
	OPERATOR INSULATION CLASS		
	H		
	COST - EACH VALVE		
	BYPASS		
	FURN & INSTALL LIMIT SWS.		
	TESTS - MAGNAFLUX		
	TESTS - X-RAY		
	NO. REQUIRED Unit 1/Unit 2		
	1/1	1/1	1/1
	TOTAL COST		
	MANUFACTURER		
	MODEL OR FIG. NO.		
	VENDOR		
	P/O (8 ITEM) NO.		
	P-104/6.5, 6.6	P-104/4.9, 4.10	P-104/4.17, 4.18
	FOREIGN PRINT NO.		
	WELD END DWG. REFERENCE		
	8031-P-300 SHEETS 75 & 72		
	P & I DIAGRAM REF.		
	M-41	M-44	M-44
	LOCATION DWG. REF.		
	(1) SEISMIC ITEM: (YES) (NO)		
	YES	NO	NO
	REMARKS		
	(1) REFER TO 2.3.3 OF SPEC 8031-P-350		
	(2) REFER TO SPEC 8031-G-11		

2 REVISED AS MARKED
 6 REVISED AS MARKED
 3 REVISED AS MARKED

 POWER DIVISION ENGINEERING	VALVE DATA SHEET MOTOR OPERATED LIMERICK GENERATING STATION UNITS 1 & 2 PHILADELPHIA ELECTRIC COMPANY		JOB No 8031 Attachment to Re- quisition No. 8031 P-104 SHEET 7 OF 22	REV. 6
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DATE	APPROVALS	MATL	SUPV	CHK	DR	ENG	DESCRIPTION
7-15-75							
1-7-74							
7-15-72							
VALVE NO.	MO-44-1F035 MO-44-2F035	MO+52-1F004 A B MO-52-2F004 A B	MO-49-1F012 MO-49-2F012				
SERVICE TYPE	CLEANUP FILTER TO SURGE & COLL'N TKS.	CORE SPRAY PUMP DISCHARGE TO REACTOR	RCIC PUMP DISCHARGE				
LINE OR EQUIPMENT REF.	GATE	GATE	GATE				
MOTOR RATING (POWER)	EBB - 460V, 3Φ, 60Hz	EBB-132, 232 460V, 3Φ, 60Hz	EBB-135, 235 240V 60S.				
SIZE	4"	12"	16"				
COMMODITY	REACTOR WATER	DEMIN. WATER	DEMIN WATER				
DESIGN/MAX. PRESS.	1320/1577	1135/1340	1300/1500				
DESIGN/MAX. TEMP.	150/140	575/582	176/170				
FLOW	270 GPM	7900 GPM	600 GPM				
VALVE RATING	500# ANSI	SEE ITEM DESCRIPTION					
TYPE ENDS/RATING	B.W. SCH 80	B.W. SCH 80	B.W. SCH 120				
BODY MATERIAL	ASME SA-216 GR WC	ASME SA-216 GR WC	ASME SA-105 GR II				
TRIM MATERIAL							
SEAT FACINGS	STELLITE						
PACKING	CRANE 187-7 or EQUAL						
TYPE BONNET	PRESSURE SEAL						
TYPE OF SEATS	INTEGRAL RENEWABLE						
TYPE OF DISC	FLEXIBLE WEDGE						
BYPASS SIZE & TYPE							
HANDWHEEL PULL-BREAKAWAY							
ACT. OP DIFF. PRESS. (max)	1320 PSI	730 PSI	1500 PSI				
PORT DIAMETER							
PRESS. DROP (PSI)							
VELOCITY (FPS)							
OPERATOR CLASS		I (IEEE STD. 323)					
MOTOR OPER (TYPE/SIZE/SPD)							
OPER. SPEED FT/MIN/HP	STANDARD						
TIME TO OPEN MAX.		12 SEC.	15 SEC				
TIME TO CLOSE MAX.		12 SEC.	15 SEC				
FULL LOAD CURRENT							
STALLED ROTOR CURRENT							
OPERATOR INSULATION CLASS		H	H				
COST - EACH VALVE							
BYPASS							
FURN & INSTALL LIMIT SWS.							
TESTS - MAGNAFLUX							
TESTS - X-RAY							
NO. REQUIRED Unit 1 / Unit 2	1 / 1	2 / 2	1 / 1				
TOTAL COST							
MANUFACTURER							
MODEL OR FIG. NO.							
VENDOR							
P/O (8 ITEM) NO.	P-104/4.13, 4.14	P-104/4.1, 4.2	P-104/3.9, 3.10				
FOREIGN PRINT NO.							
WELD END DWG. REFERENCE	8031-P-300	SHEETS 75 & 72					
P & I DIAGRAM REF.	M-44	11-52	M-49				
LOCATION DWG. REF.							
(1) SEISMIC ITEM: (YES) (NO)	NO	YES	YES				
REMARKS	(1) REFER TO 2.3.3 OF SPEC 8031-P-350 (2) REFER TO SPEC 8031-G-11						

7 REVISED AS MARKED
 6 REVISED AS MARKED
 3 REVISED AS MARKED

 POWER DIVISION ENGINEERING	VALVE DATA SHEET MOTOR OPERATED Limerick Generating Station Units 1 & 2 Philadelphia Electric Company	JOB No 8031 Attachment to Re- quisition No. 8031- P-104	REV. P-104
	SHEET 8 OF 22		

DATE	APPROVALS	MATL	SUPV	CHK	OR	ENG	DESCRIPTION
8-14-72							
7-7-74							
7-15-74							
VALVE NO.	MO-51-1F023 MO-51-2F023	MO-41-1F032A,B MO-41-2F032A,B	MO-41-109A,B MO-41-209A,B				
SERVICE TYPE	REACTOR HEAD SPRAY	FEED WATER INTO BOILER	STARTUP RECIRC. GATE				
LINE OR EQUIPMENT REF.	ECB1-111,211	DBB-103,203,104,204	DBB-103,203,104,204				
MOTOR RATING (POWER)	240V DC	460V, 3Φ, 60HZ	460V, 3Φ, 60HZ				
SIZE	6"	24"	16"				
COMMODITY	WATER OR STEAM	FEEDWATER	FEEDWATER				
DESIGN/MAX. PRESS.	115 / 133	1777 / 2132	1777 / 2132				
DESIGN/MAX. TEMP.	582 / 582	459 / 459	459 / 459				
FLOW	NORMAL	17,566 GPM	11,570 GPM				
VALVE RATING	600# ANSI	SEE ITEM DESCRIPTION					
TYPE ENDS/RATING	B.W. SCH. 80	B.W. SCH. 120	B.W. SCH. 120				
BODY MATERIAL	ASME SA-216 GR WCB	BR SA-105 GR T					
TRIM MATERIAL							
SEAT FACINGS	STELLITE						
PACKING	CRANE 187-J						
TYPE BONNET	OR CAP	BOLTED	PRESSURE SEAL				
TYPE OF SEATS		INTEGRAL OR RENEWABLE					
TYPE OF DISC		PAUG	SWING OR TILTING				
BYPASS SIZE & TYPE							
HANDWHEEL PULL-BREAKAWAY							
ACT. OP. DIFF. PRESS. (max)	1115 PSI	0	700 PSI				
PORT DIAMETER							
PRESS. DROP (PSI)							
VELOCITY (FPS)							
(2) OPERATOR CLASS		I (IEEE STD. 323)					
MOTOR OPER (TYPE/SIZE/SPD)							
OPER. SPEED FT/MIN/MP	STANDARD	STANDARD	STANDARD				
TIME TO OPEN							
TIME TO CLOSE							
FULL LOAD CURRENT							
STALLED ROTOR CURRENT							
OPERATOR INSULATION CLASS		H	H				
COST - EACH VALVE							
BYPASS							
FURN & INSTALL LIMIT SWS.							
TESTS - MAGNAFLUX							
TESTS - X-RAY							
NO. REQUIRED	Unit 1 / Unit 2	1 / 1	2 / 2	2 / 2			
TOTAL COST							
MANUFACTURER							
MODEL OR FIG. NO.							
VENDOR							
P/O (8 ITEM) NO.	P-104 / 6.1, 6.2	P-104 / 9.1, 9.2	P-104 / 3.15, 3.16				
FOREIGN PRINT NO.							
WELD END DWG. REFERENCE	8031-P-300	SHEETS 75 & 72					
P & I DIAGRAM REF.	M-51	M-41	M-41				
LOCATION DWG. REF.							
(1) SEISMIC ITEM: (YES) (NO)	YES	YES	YES				
REMARKS	(1) REFER TO 2.3.3 OF SPEC. 8031-P-950 - (2) REFER TO SPEC 8031-G-11						

2 REVISED AS MARKED
 6 REVISED AS MARKED
 3 REVISED AS MARKED

 BECHTEL POWER DIVISION ENGINEERING	VALVE DATA SHEET MOTOR OPERATED		JOB No 8031	REV.
	Limerick Generating Station Units 1 & 2 Philadelphia Electric Company		Attachment to Requisition No. 8031 P-104 SHEET 9 OF 22	6

7-15-15	DATE	3" - DRA - CK - F
1-1-14	APPROVALS	VALVE NO. 1F086/2F086
1-1-12	APPROVALS	SERVICE CKD WATER TO REACTOR
	APPROVALS	TYPE CHECK
	APPROVALS	LINE OR EQUIPMENT REF. DBA-109 (209)
	APPROVALS	SIZE 3"
	APPROVALS	COMMODITY CONDENSATE WATER
	APPROVALS	DESIGN/MAX. PRESS. PSIG 1750 / 1750
	APPROVALS	DESIGN/MAX. TEMP. OF 150 / 150
	APPROVALS	FLOW 15 GPM
	APPROVALS	VALVE RATING 900# (ASME SEC. III)
	APPROVALS	TYPE ENDS/RATING B.W. / SCH. 80
	APPROVALS	BODY MATERIAL ASME SA-216 GR. WC8 OR SA-105 GR. II
	APPROVALS	TRIM MATERIAL
	APPROVALS	SEAT FACINGS STELLITED
	APPROVALS	PACKING CRANE 187-I OR EQUAL
	APPROVALS	TYPE BONNET PRESSURE SEAL
	APPROVALS	TYPE OF SEATS INTEGRAL OR RENEWABLE
	APPROVALS	TYPE OF DISC SWING
	APPROVALS	BYPASS SIZE & TYPE
	APPROVALS	HANDWHEEL PULL-BREAKAWAY
	APPROVALS	B AT FULL DIFF. PRESS.
	APPROVALS	PORT DIAMETER
	APPROVALS	PRESS. DROP (PSI)
	APPROVALS	VELOCITY (FPS)
	APPROVALS	VALVE WEIGHT LBS
	APPROVALS	MOTOR OPER (TYPE/SIZE/SFD)
	APPROVALS	OPER. SPEED FT/MIN/HP
	APPROVALS	TIME TO OPEN
	APPROVALS	TIME TO CLOSE
	APPROVALS	FULL LOAD CURRENT (440V, 3Ø, 80C)
	APPROVALS	STALLED ROTOR CURRENT
	APPROVALS	MOTOR OPERATOR WEIGHT
	APPROVALS	COST - EACH VALVE
	APPROVALS	BYPASS
	APPROVALS	FURN & INSTALL LIMIT SWS.
	APPROVALS	TESTS - MAGNAFLUX
	APPROVALS	TESTS - X-RAY
	APPROVALS	NO. REQUIRED UNIT 1 / UNIT 2 1 / 1
	APPROVALS	TOTAL COST
	APPROVALS	MANUFACTURER
	APPROVALS	MODEL OR FIG. NO.
	APPROVALS	VENDOR
	APPROVALS	P/O (8 ITEM) NO. P-104 M.1.7.2
	APPROVALS	FOREIGN PRINT NO.
	APPROVALS	WELD END DWG. REFERENCE 8031-P-300 SHEETS 72+75
	APPROVALS	P & I DIAGRAM REF. M-46
	APPROVALS	LOCATION DWG. REF.
	APPROVALS	REMARKS

7 REVISED AS INDICATED
 6 REVISED AS MARKED
 0 ISSUED FOR PURCHASE



VALVE DATA SHEET
CHECK VALVE

LIMERICK GENERATING STATION UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

JOB No	Attachment to M/R No. 8031-P-104	REV. 7
SHEET 10 OF 22		

DATE	APPROVALS	MATL	SUPPLY	CHK	DR	ENG	DESCRIPTION
1-7-74							
VALVE NO.	AO-46-1F121 AO-46-2F121	AO-01-109 AO-01-209	AO-01-108 AO-01-208				
SERVICE TYPE	CRD WATER TO REACTOR POWER ASSIST CHECK	MAIN STEAM TO HETWELL SPARGERS GATE	MAIN STEAM TO RFP TURBINE GATE				
LINE OR EQUIPMENT REF.	DBA-109 (209)	EBB-106 (206)	EBB-104 (204)				
POWER RATING (SOLENOID)	115V, 1Φ, 60HZ	115V, 1Φ, 60HZ	115V, 1Φ, 60HZ				
SIZE	3"	6"	6"				
COMMODITY	CONDENSATE WATER	MAIN STEAM	MAIN STEAM				
DESIGN/MAX. PRESS. PSIG	1750 / 1750	1115 / 1337	1115 / 1337				
DESIGN/MAX. TEMP. °F	150 / 150	582 / 582	582 / 582				
FLOW	15 GPM		280000 LBS/HR				
VALVE RATING	900# (ASME)	SEE ITEM DESCRIPTION	SEE ITEM DESCRIPTION				
TYPE ENDS/RATING	B.W. / SCH. 80	B.W. / SCH. 80	F.W. / SCH. 80				
BODY MATERIAL	ASME SA-216 GR.	WCB OR SA-105	GR. 21				
TRIM MATERIAL							
SEAT FACINGS	STELLITED						
PACKING	CRANE 187-I OR EQUAL						
TYPE BONNET	PRESSURE SEAL						
TYPE OF SEATS	INTEGRAL OR RENEWABLE						
TYPE OF DISC	SWING	FLEXIBLE WEDGE					
BYPASS SIZE & TYPE							
HANDWHEEL PULL-BREAKAWAY							
ACT. OP. DIFF. PRESS. MAX	0	1352 PSI	1352 PSI				
PORT DIAMETER							
PRESS. DROP (PSI)							
VELOCITY (FPS)							
VALVE WEIGHT LBS							
AIR SUPPLY PRESS. PSIG	80 MIN. / 100 MAX						
OPER. SPEED FT/MIN/HP	STANDARD	STANDARD	STANDARD				
TIME TO OPEN							
TIME TO CLOSE							
FAILURE MODE	FAIL CLOSE	FAIL OPEN	FAIL OPEN				
(2) SOLENOID OPERATING FORM	I	I	I				
OPERATOR WEIGHT							
COST - EACH VALVE							
BYPASS							
FURN & INSTALL LIMIT SWS.							
TESTS - MAGNAFLUX							
TESTS - X-RAY							
NO. REQUIRED UNIT 1 / UNIT 2	1 / 1	1 / 1	1 / 1				
TOTAL COST							
MANUFACTURER							
MODEL OR FIG. NO.							
VENDOR							
P/O (& ITEM) NO.	P-104 / 11.1, 11.2	P-104 / 13.3 & 13.4					
FOREIGN PRINT NO.							
WELD END DWG. REFERENCE							
P & I DIAGRAM REF.	M-46	M-01	M-01				
LOCATION DWG. REF.							
(1) SEISMIC ITEM: (YES)(NO)	YES	YES	YES				
REMARKS	(1) REFER TO 2.3.3 OF SPEC 8031-P-350 (2) REFER TO 5.3.3(b) OF SPEC 8031-P-350						

TO REVISED AS MARKED
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 ISSUED FOR T.A.C.



VALVE DATA SHEET
 Air OPERATED
LIMERICK GENERATING STATION UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

JOB No
 Attachment to
 M/R No.
 8031-P-104
 SHEET 11 OF 22

REV.
 7

DATE	APPROVALS	MATL	SUPPLY	CHKD	DR	ENG	DESCRIPTION
7-15-74							REVISED AS MARKED ISSUED FOR P-104
VALVE NO.	MO-51-1F052 A&B MO-51-2F052 A&B	MO-46-1F082 MO-46-2F082	MO-44-1F039 MO-44-2F039				
SERVICE TYPE	STEAM FROM HPCI TO RHR HT EXCH'R GLOBE	CRD WATER TO REACTOR GATE	RWC WATER IN/3 RGIC SYSTEM STOPCHECK				
LINE OR EQUIPMENT REF.	EPB-121 (221)	DBB-106 (206)	DBB-105 (205)				
MOTOR RATED POWER	460V, 3Φ, 60HZ	460V, 3Φ, 60HZ	460V, 3Φ, 60HZ				
SIZE	10"	3"	4"				
COMMODITY	STEAM	CONDENSATE WATER	DEMIN. WATER				
DESIGN/MAX. PRESS.	PSIG 1115 / 1337	1750 / 1750	SEE ITEM DESCRIPTION				
DESIGN/MAX. TEMP.	°F 582 / 582	150 / 150	- DITTO -				
FLOW	134 800 #/HR (3)	15 GPM	480 GPM				
VALVE RATING	SEE ITEM DESCRIPTION	900 # ANSI	SEE ITEM DESCRIPTION				
TYPE ENDS/RATING	B.W. 1SCH 80	B.W. 1SCH 160	B.W. 1SCH 120				
BODY MATERIAL	ASME SA-216 GR.	W.C.B. OR SA-105 GR. II					
TRIM MATERIAL							
SEAT FACINGS	STELLITE	STELLITE	STELLITE				
PACKING	CRANE 187-T OR EQUAL	PRESSURE SEAL	PRESSURE SEAL				
TYPE BONNET	INTEGRAL OR PLUG	RENEWABLE	SOLID WEDGE				
TYPE OF SEATS			SWING OR TILTING				
TYPE OF DISC							
BYPASS SIZE & TYPE							
HANDWHEEL PULL-BREAKAWAY							
ACT. OP. DIFF. PRESS.	MAY 1337 PSI	1750 PSI	0				
PORT DIAMETER							
PRESS. DROP (PSI)							
VELOCITY (FPS)							
(2) OPERATOR CLASS	I (IEEE STD. 323)	I (IEEE STD. 323)	I (IEEE STD. 323)				
MOTOR OPER (TYPE/SIZE/SPD)							
OPER. SPEED FT/MIN/HP	STANDARD	STANDARD	STANDARD				
TIME TO OPEN							
TIME TO CLOSE							
FULL LOAD CURRENT (440V, 3Φ, 60C)							
STALLED ROTOR CURRENT							
OPERATION INSULATION CLASS	H	H	H				
COST - EACH VALVE							
BYPASS							
FURN & INSTALL LIMIT SWS.							
TESTS - MAGNAFLUX							
TESTS - X-RAY							
NO. REQUIRED	UNIT 1 / UNIT 2 2 / 2	1 / 1	1 / 1				
TOTAL COST							
MANUFACTURER							
MODEL OR FIG. NO.							
VENDOR							
P/O (& ITEM) NO.	P-104 / 6.7, 6.8	P-104 / 3.13, 3.14	P-104 / 9.3, 9.4				
FOREIGN PRINT NO.							
WELD END DWG. REFERENCE	5031-P-300	SHEETS 75 & 72					
P & I DIAGRAM REF.	M-51	M-46	M-44				
LOCATION DWG. REF.							
(1) SEISMIC ITEM (YES) (NO)	YES	YES	YES				
REMARKS	(1) REFER TO 2.3.3 OF SPEC 8031-P-350 (2) REFER TO SPEC 8031-G-11 (3) ALSO MUST PASS 90,000#/HR AT 100 PSIG						



VALVE DATA SHEET
 MOTOR OPERATED
 Philadelphia Electric Company
 Limerick Generating Station 1 & 2

JOB No
 Attachment to
 M/R No.
 8031-P-104
 SHEET 12 OF 22

REV.
 7

DATE	APPROVALS	MATL	SUPV	CHK	DR	ENG	REV. DESCRIPTION
1-7-74							
2-14-72							
VALVE NO.	AO-01-111	AO-44-1F039	AO-69-147				
SERVICE TYPE	MAIN STEAM TO STAM SEAL EVAPORATOR GATE	RWC WATER INTO RWC SYSTEM STOPCHECK	NON-COND OUTLET FROM AFTER CONDENSER GLOBE				
LINE OR EQUIPMENT REF.	EBB-101(201)	DBB-105(205)	DBG-101(201)				
PR. RATING (SOLENOID)	115V, 1 ϕ , 60HZ	115V, 1 ϕ , 60HZ	115V, 1 ϕ , 60HZ				
SIZE	8"	4"	3"				
COMMODITY	MAIN STEAM	DEMIN WATER	OFF-GAS				
DESIGN/MAX. PRESS. PSIG	1115/1337	1777/2132	1550/1850				
DESIGN/MAX. TEMP. OF	582/582	459/459	110/110				
FLOW	MAY (LATER)	480 GPM	150 SCFM				
VALVE RATING	SEE ITEM DESCRIPTION		900# ANSI				
TYPE ENDS/RATING	B.W / SCH 80	B.W / SCH 120	B.W / SCH 160				
BODY MATERIAL	ASME SA-216 GR	WCB OR SA-105	GR. II				
TRIM MATERIAL							
SEAT FACINGS	STELLITE						
PACKING	CRANE 187-J OR EQUAL						
TYPE BONNET	PRESSURE SEAL						
TYPE OF SEATS	INTEGRAL OR	RENEWABLE					
TYPE OF DISC	FLEXIBLE WEDGE	SWING OR TILTING	CONE				
BYPASS SIZE & TYPE							
HANDWHEEL PULL-BREAKAWAY							
ACT. C.F. DIFF. PRESS. MAX	1352 PSI	0	21 PSI				
PORT DIAMETER							
PRESS. DROP (PSI)		MIN POSSIBLE	MIN POSSIBLE				
VELOCITY (FPS)							
VALVE WEIGHT LBS							
AIR SUPPLY PRESS. PSIG	80 MIN / 100 MAX						
OPER. SPEED FT/MIN/HP	STANDARD						
TIME TO OPEN							
TIME TO CLOSE							
FAILURE MODE	FAIL OPEN		FAIL CLOSE				
(2) DLENCO OPERATING FORM	I	I	I				
OPERATOR WEIGHT							
COST - EACH VALVE							
BYPASS							
FURN & INSTALL LIMIT SWS.							
TESTS - MAGNAFLUX							
TESTS - X-RAY							
NO. REQUIRED UNIT 1 / UNIT 2	1 / 1	1 / 1	1 / 1				
TOTAL COST							
MANUFACTURER							
MODEL OR FIG. NO.							
VENDOR							
P/O (8 ITEM) NO.	P-104/13.5, 13.6	P-104/14.1 + 14.2	P-104/15.1, 15.2				
FOREIGN PRINT NO.							
WELD END DWG. REFERENCE	SPEC 8031-P-300 SHEETS 72 + 75						
P & I DIAGRAM REF.	M-01	M-44	M-69				
LOCATION DWG. REF.							
(1) SEISMIC ITEM: (YES) (NO)	YES	YES	NO				
REMARKS	(1) REFER TO 2.3.3 OF SPEC 8031-P-350 (2) REFER TO 5.3.3 (b) OF SPEC 8031-P-350						



VALVE DATA SHEET
AIR OPERATED

Philadelphia Electric Company
Limerick Generating Station 1 & 2

JOB No
Attachment to
M/R No.
8031-P-104

REV.
6

SHEET 13 OF 22

M-323-E
4-14-58

6 REVISED AS MARKED
13-100 FOR PURCHASE

DATE	APPROVALS	MATL	SUPPLY	CHK	DR	ENG	DESCRIPTION
4-14-76							
7-7-74							
VALVE NO	MO-41-105 MO-41-205	MO-44-1F031 MO-44-2F031	MO-44-1F034 MO-44-1F035 MO-44-2F034 MO-44-2F035				
SERVICE TYPE	MAIN STEAM LINE DRAIN GATE	RWC FROM ECC-108 (208) THRU VLV F034+35 GLOBE	RWC FROM ECC-108 (208) THRU VLV F034+35 GATE				
LINE OR EQUIPMENT REF.	DBA-105 (205)	EBC-108 (208)	EBC-108 (208)				
MOTOR RATED POWER	460V, 3P, 60HZ	460V, 3P, 60HZ	460V, 3P, 60HZ				
SIZE	3"	4"	4"				
COMMODITY	CONDENSATE/MAIN STM.	REACTOR WATER	REACTOR WATER				
DESIGN/MAX. PRESS.	1250/1337	1300/1542	1290/1542				
DESIGN/MAX. TEMP.	575/582	150/150	150/150				
FLOW	50 GPM	270 GPM	270 GPM				
VALVE RATING	900# ASME	900# ANSI	900# ANSI				
TYPE ENDS/RATING	B.W / SCH 160	BW / SCH 80	BW / SCH 80				
BODY MATERIAL	ASME SA-216 GR	NCB OR SA-105	GR II				
TRIM MATERIAL							
SEAT FACINGS	STELLITE						
PACKING	GRAVE B7-I						
TYPE BONNET	PRESSURE SEAL						
TYPE OF SEATS	INTEGRAL OR RENEWABLE						
TYPE OF DISC	SOLID WEDGE	CONE	FLEXIBLE WEDGE				
BYPASS SIZE & TYPE							
HANDWHEEL PULL-BREAKAWAY							
ACT. OPER. DIFF. PRESS. PSI	1250	1189	1189				
PORT DIAMETER							
PRESS. DROP (PSI)							
VELOCITY (FPS)							
VALVE WEIGHT LBS							
MOTOR OPER (TYPE/SIZE/SPD)							
OPER. SPEED FT/MIN/HP	STANDARD						
MOTOR CLASS	XX CLASS I (IEEE STD 323)	NON CLASS I					
MOTOR INSULATION CLASS	H	H	H				
FULL LOAD CURRENT (460V, 3P, 60C)							
STALLED ROTOR CURRENT							
MOTOR OPERATOR WEIGHT							
COST - EACH VALVE							
BYPASS							
FURN & INSTALL LIMIT SWS.							
TESTS - MAGNAFLUX							
TESTS - X-RAY							
NO. REQUIRED UNIT 1 / UNIT 2	1/1	1/1	2/2				
TOTAL COST							
MANUFACTURER							
MODEL OR FIG. NO.							
VENDOR							
P/O (B ITEM) NO.	P-104/1.9 & 1.10	P-104/16.1, 16.2	P-104/17.1 & 17.2				
FOREIGN PRINT NO.							
WELD END DWG. REFERENCE	8031-P-300 SHEETS 72475						
P & I DIAGRAM REF.	M-41	M-44	M-44				
LOCATION DWG. REF.							
* SEISMIC ITEM (YES) (NO)	YES	YES ***	YES ***				
REMARKS	* REFER TO 2.3.3 OF SPEC 8031-P-350 ** REFER TO SPEC 8031-4-11 *** SEE PARA. 19.0 OF DESIGN SPEC P-104						

7 REVISED AS MARKED
 6 ISSUED FOR CONSTRUCTION



VALVE DATA SHEET
 MOTOR OPERATED
 LIMERICK GENERATING STATION UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

JOB NO 8031
 ATTACHMENT TO
 M/R No.
 8031-P-104
 SHEET 14 OF 22

REV 9

DATE	AD-69-145		
	AD-69-245		
APPROVALS	VALVE NO.		
	SERVICE TYPE	BLOCK VALVE BETWEEN 1ST & 2ND HOLDUP PIPES GATE	
MATERIAL	LINE OR EQUIPMENT REF.	EBC 107 (207)	
	SOLENOID POWER RATING	115V 1Ø 60HZ	
SUPPLY	SIZE	4"	
	COMMODITY	OFF-GAS	
OR	DESIGN/MAX. PRESS.	1110/1330	
	DESIGN/MAX. TEMP.	110/110	
ENG'	FLOW	75 SCFM	
	VALVE RATING	600# ANSI	
DESCRIPTION	TYPE ENDS/RATING	SLH 80/8W	
	BODY MATERIAL	ASME SA 216 WCB OR SA-105 GR16	
REV.	TRIM MATERIAL		
	SEAT FACINGS	STELLITE	
	PACKING	CRANE 187-I OR EQUAL	
	TYPE BONNET	BOLTED	
	TYPE OF SEATS	INTEGRAL OR RENEWABLE	
	TYPE OF DISC	FLEXIBLE WEDGE	
	BYPASS SIZE & TYPE		
	HANDWHEEL PULL-BREAKAWAY		
	ACT. OPER. DIFF. PRESS.	21 PSI	
	PORT DIAMETER		
	PRESS. DROP (PSI)	MIN. POSSIBLE	
	VELOCITY (FPS)		
	VALVE WEIGHT LBS		
	AIR SUPPLY PRESS. PSIG	80 MIN/100 MAX	
	OPER. SPEED FT/MIN/HP		
	TIME TO OPEN		
	TIME TO CLOSE		
	FULL LOAD CURRENT (440V, 3Ø, 60C)		
	SOLENOID OPERATING FORM	I	
	FAILURE MODE	FAIL CLOSE	
	COST - EACH VALVE		
	BYPASS		
	FURN & INSTALL LIMIT SWS.		
	TESTS - MAGNAFLUX		
	TESTS - X-RAY		
	NO. REQUIRED UNIT 1 / UNIT 2	1 / 1	
	TOTAL COST		
	MANUFACTURER		
	MODEL OR FIG. NO.		
	VENDOR		
	P/O (8 ITEM) NO.	P-104/18.1, 18.2	
	FOREIGN PRINT NO.		
	WELD END DWG. REFERENCE	SPEC 8031-P-300 SHEETS 72 & 75	
	P & I DIAGRAM REF.	M-69	
	LOCATION DWG. REF.		
	* SEISMIC ITEM (YES) (NO)	NO	
	REMARKS	* REFER TO 2.3.3 OF SPEC 8031-P-350	



VALVE DATA SHEET
AIR OPERATED
LIMERICK GENERATING STATION UNITS 1 & 2
PHILADELPHIA ELECTRIC COMPANY

JOB No 8031
ATTACHMENT TO
M/R No.
8031-P-104
SHEET 15 OF 22
REV 6

ISSUED FOR CONSTRUCTION

9-7-79	DATE	MO-69-140,146 MO-69-240,246	MO-01-109 MO-01-209	MO-01-108 MO-01-208
7-15-75	APPROVALS			
	MATL			
	EMPY			
	CASE			
	OR			
	ENG			
	DESCRIPTION			
	VALVE NO.			
	SERVICE	STARTUP VENT + BYPASS TO THRB, BLDG VENT	M.S. TO HOTWELL SPARGERS	M.S. TO RFP TURBINE
	TYPE	GATE	GATE	GATE
	LINE OR EQUIPMENT REF.	EBC-107 (207)	EBB-106 (206)	EBB-104 (204)
	MOTOR RATED POWER	460V 3Ø 60HZ	460V 3Ø 60HZ	
	SIZE	6"	6"	6"
	COMMODITY	OFF-GAS	MAIN STEAM	MAIN STEAM
	DESIGN/MAX. PRESS.	1110/1330	1115/1337	1115/1337
	DESIGN/MAX. TEMP.	110/110	582/582	582/582
	FLOW	2000 SCFM	288,000 #/HR	280,000 #/HR
	VALVE RATING	600# ASME	900# ASME	900# ASME
	TYPE ENDS/RATING	BW/SCH 80	BW/SCH 80	BW/SCH 80
	BODY MATERIAL	ASME SA-216W	CB OR SA-105	CL.TL
	TRIM MATERIAL			
	SEAT FACINGS	STELLITE		
	PACKING	CRANE 187-T		
	TYPE BONNET	FOLDED		
	TYPE OF SEATS	INTEGRAL OR RENEWABLE		
	TYPE OF DISC	FLEXIBLE WEDGE		
	BYPASS SIZE & TYPE			
	HANDWHEEL PULL-BREAKAWAY			
	ACT. OPER. DIFF. PRESS.	21 PSI	1352 PSI	1352 PSI
	PORT DIAMETER			
	PRESS. DROP (PSI)	MIN POSSIBLE		
	VELOCITY (FPS)			
	VALVE WEIGHT LBS			
	MOTOR OPER (TYPE/SIZE/SPD)			
	OPER. SPEED FT/MIN/HP	STANDARD	STANDARD	STANDARD
	MOTOR CLASS	NON-CLASS I	CLASS I (IEEE STD 323)	
	MOTOR INSULATION CLASS	H	H	H
	FULL LOAD CURRENT (440V, 3Ø, 60C)			
	STALLED MOTOR CURRENT			
	MOTOR OPERATOR WEIGHT			
	COST - EACH VALVE			
	BYPASS			
	FURN & INSTALL LIMIT SWS.			
	TESTS - MAGNAFLUX			
	TESTS - X-RAY			
	NO. REQUIRED UNIT 1 / UNIT 2	2 / 2	1 / 1	1 / 1
	TOTAL COST			
	MANUFACTURER			
	MODEL OR FIG. NO.			
	VENDOR			
	P/O (8 ITEM) NO.	P-104/19.1, P.2	P-104/4.23 & 4.24	
	FOREIGN PRINT NO.			
	WELD END DWG. REFERENCE	SPEC 8031-P-300 SHEETS	72 & 75	
	P & I DIAGRAM REF.	M-69	M-01	M-01
	LOCATION DWG. REF.			
	* SEISMIC ITEM (YES) (NO)	NO	YES	YES
	REMARKS	* REFER TO 2.3.3 OF SPEC 8031-P-350		

15 Revised as noted
 7 Check items 6.1 & 6.2 to 4.23 & 9.
 6 BESSER FOR CONSTRUCTION



VALVE DATA SHEET
 MOTOR OPERATED
 LIMERICK GENERATING STATION UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

JOB No 8031
 ATTACHMENT TO
 M/R No.
 8031-P-104
 SHEET 16 OF 22

REV. 15

REV. DESCRIPTION	EMG	DR	CVR	SUPV	MATL	APPROVALS	DATE			
							1-3-58	9-15-58	7-24-58	
							MO-01-111	MO-55-1F002 MO-55-2F002	MO-55-1F003 MO-55-2F003	
							VALVE NO.			
							SERVICE TYPE	H.S. TO STM SEAL EVAPORATOR GATE	HPCI TURBINE STEAM SUPPLY Y-PATTERN GLOBE	HPCI TURBINE STEAM SUPPLY
							LINE OR EQUIPMENT REF.	EBB-101 (201)	DBA-106, 206	DLA-109, 200
							MOTOR RATED POWER	460V, 30, 60HZ	460V, 30, 60HZ	460V, 30, 60HZ
							SIZE	8"	10"	10"
							COMMODITY	MAIN STEAM	MAIN STEAM	MAIN STEAM
							DESIGN/MAX. PRESS.	1115/1337	1250/1337	1250/1337
							DESIGN/MAX. TEMP.	582/582	575/582	575/582
							FLOW	60,000 #/HR	235,000 #/HR	22,000 #/HR
							VALVE RATING	900# ASME	600# ASME	600# ASME
							TYPE ENDS/RATING	BW/SCH 80	BW/SCH 80	BW/SCH 80
							BODY MATERIAL	SA 216 GR	WCB/SA-105	CRJI
							TRIM MATERIAL			
							SEAT FACINGS	STELLITE		
							PACKING	GRAPE 187-2 OR APPROVED EQUAL		
							TYPE BONNET	PRESSURE SEAL		
							TYPE OF SEATS	INTEGRAL OR RENEWABLE		
							TYPE OF DISC	FLEX. WEDGE		
							BYPASS SIZE & TYPE			
							HANDWHEEL PULL-BREAKAWAY			
							ACT. OPER. DIFF. PRESS. MAX	1352 PSI	1337 PSI	1337 PSI
							PORT DIAMETER			
							PRESS. DROP (PSI) MAX		1	1
							VELOCITY (FPS)			
							VALVE WEIGHT LBS			
							MOTOR OPER (TYPE/SIZE/SPD)	CLASS I (IEEE STD 323)		
							OPER. SPEED FT/MIN/MP	STANDARD		
							TIME TO CLOSE (MAX)		12 SEC.	12 SEC.
							MOTOR INSULATION CLASS	H	H	H
							FULL LOAD CURRENT (440V, 30, 60C)			
							STALLED ROTOR CURRENT			
							MOTOR OPERATOR WEIGHT			
							COST - EACH VALVE			
							BYPASS			
							FURN & INSTALL LIMIT SWS.			
							TESTS - MAGNAFLUX			
							TESTS - X-RAY			
							NO. REQUIRED UNITS/UNIT 2	1/1	1/1	1/1
							TOTAL COST			
							MANUFACTURER			
							MODEL OR FIG. NO.			
							VENDOR			
							P/O (8 ITEM) NO.	P-104/4.25	P-104/21.1, 21.2	P-104/21.3, 21.4
							FOREIGN PRINT NO.			
							WELD END DWG. REFERENCE	SPEC 8031-P-350 SHEETS 72 & 73		
							P & I DIAGRAM REF.	M-01	M-55	M-55
							LOCATION DWG. REF.			
							*SEISMIC ITEM (YES)/(NO)	YES	YES	YES
							REMARKS	*REFER TO 2.3.3 OF SPEC 8031-P-350		

2 REVISED AS MARKED
 20 Deleted from 4.26 (NOW ON 13)
 13 REVISED AS MARKED



VALVE DATA SHEET
 MOTOR OPERATED
 LIMERICK GENERATING STATION UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

JOB NO 8031
 ATTACHMENT TO
 M/R No.
 8031-P-104
 SHEET 17 OF 22

REV. 20

1-3-78 DATE
 7-15-75 DATE
 M/S
 M/S
 4-14-58
 2 REVISED AS MARKED
 7 ADDED THIS SHEET
 REV. DESCRIPTION
 M/S
 M/S
 M/S

VALVE NO.	MO-49-1F007 MO-49-2F007	MO-49-1F008 MO-49-2F008	MO-01-150 MO-01-250
SERVICE TYPE	RCIC TURBINE STEAM SUPPLY	RCIC TURBINE STEAM SUPPLY	STEAM TO AIR EJECTORS
LINE OR EQUIPMENT REF.	Y-PATTERN GLOBE VALVE	DBA 107, 207	GATE
MOTOR RATING	DBA -107, 207	DBA 107, 207	EBB -101
SIZE	460V, 3φ, 60HZ 3"	460V, 3φ, 60HZ 3"	460V, 3φ, 60HZ 4"
COMMODITY	STEAM	STEAM	STEAM
DESIGN/MAX. PRESS. PSIG.	1250 / 1337	1250 / 1337	1115 / 1337
DESIGN/MAX. TEMP. °F	575 / 582	575 / 582	582 / 582
FLOW LBS/HR MAX	33,000	33,000	23,000
VALVE RATING	900# ASME	900# ASME	SEE ITEM DESCRIPTION
TYPE ENDS/RATING	BW / SCH 160	BW / SCH 160	BW / SCH 80
BODY MATERIAL	SA 216 GR WCB	SA 105	
TRIM MATERIAL			
SEAT FACINGS	STELLITE		
PACKING	CRANE 187-I		
TYPE BONNET	PRESSURE SEAL		
TYPE OF SEATS	INTEGRAL / RENEWABLE		
TYPE OF DISC			FLEX, WEDGE
BYPASS SIZE & TYPE			
HAND WHEEL PULL-BREAKAWAY			
ACT. OP. DIFF. PRESS. MAX	1337 PSI	1337 PSI	1337 PSI
PORT DIAMETER			
PRESS. DROP (PSI) MAX	1	1	
VELOCITY (FPS)			
VALVE WEIGHT LBS			
MOTOR OPER (TYPE/SIZE/SPD)	(2) CLASS I (IEEE STD 323)		
OPER. SPEED FT/MIN/HP			STANDARD
OPER CLASS INSULATION	H	H	H
TIME TO CLOSE MAXIMUM	7.2 SEC.	7.2 SEC.	
FULL LOAD CURRENT (460V, 3φ, 60C)			
STALLED ROTOR CURRENT			
MOTOR OPERATOR WEIGHT			
COST - EACH VALVE			
BYPASS			
FURN & INSTALL LIMIT SYS.			
TESTS - MAGNAFLUX			
TESTS - X-RAY			
NO. REQUIRED UNIT 1 / UNIT 2	1 / 1	1 / 1	1 / 1
TOTAL COST			
MANUFACTURER			
MODEL OR FIG. NO.			
VENDOR			
P/O (8 ITEM) NO.	P-104 / 22.1, 22.2	P-104 / 22.3, 22.4	P-104 / 4.27, 4.28
FOREIGN PRINT NO.			
WELD END DWG. REFERENCE	8031-P-300,	SHEETS 72 & 75	
P & I DIAGRAM REF.	M-49	M-49	M-01
LOCATION DWG. REF.			
(1) SEISMIC ITEM; (YES) (NO)	YES	YES	YES
REMARKS	(1) REFER TO 2.3.3 OF SPEC 8031-P-350		
	(2) REFER TO 8031-G-11		

DICHTEL CORPORATION

 POWER DIVISION
 ENGINEERING



VALVE DATA SHEET
 MOTOR OPERATED

 LIMERICK GENERATING STATION UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

DRAWING NO **8031**
 ATTACHMENT TO
 M/R NO
8031-P-104
 SHEET 18 OF 22

DIV.
12

9-14-79
7-15-75
MWS
MWS
IS REVISID AS MARKED
7 ADDER THIS SHEET
REV. DESCRIPTION

VALVE NO.	MO-55-1FO12 MO-55-2FO12	MO-55-1FO11 MO-55-2FO11
SERVICE TYPE	HPCI MIN FLOW RECIRCULATION GLOBE	HPCI PUMP TEST TO COND TANK GATE
LINE OR EQUIPMENT REF.	EBB-130 (230)	EBB-134 (234)
MOTOR RATED POWER	240V D.C.	240V D.C.
SIZE	4"	10"
COMMODITY	WATER	CONDENSATE
DESIGN/MAX. PRESS.	1396 / 1625	1396 / 1625
DESIGN/MAX. TEMP.	170 / 170	170 / 170
FLOW	750 G.P.M.	5600 G.P.M.
VALVE RATING	900# ASME	900# ASME
TYPE ENDS/RATING	BW SCH 80	B.W. SCH 120
BODY MATERIAL		SA 216 WCB / SA-105
TRIM MATERIAL		
SEAT FACINGS	STEELITE	STELLITE
PACKING	CRANE 187-I	CRANE 187-I
TYPE BONNET	PRESSURE SEAL	PRESS. SEAL
TYPE OF SEATS	INTEGRAL	INTEGRAL / RENEWABLE
TYPE OF DISC		
BYPASS SIZE & TYPE		
HANDWHEEL PULL-BREAKAWAY		
ACT. OP. DIFF. PRESS.	1625 PSI	1000 PSI
PORT DIAMETER		
PRESS. DROP (PSI)		
VELOCITY (FPS)		
VALVE WEIGHT LBS		
MOTOR OPER (TYPE/SIZE/SPD)		CLASS 1 (IEEE 323)
OPER. SPEED FT/MIN/HP	STANDARD	STANDARD
OPER CLASS INSULATION	H	H 
TIME TO CLOSE		
FULL LOAD CURRENT (440V, 3P, 60C)		
STALLED ROTOR CURRENT		
MOTOR OPERATOR WEIGHT		
COST - EACH VALVE		
BYPASS		
FURN & INSTALL LIMIT SVS.		
TESTS - MAGNAFLUX		
TESTS - X-RAY		
NO. REQUIRED UNIT 1 / UNIT 2	1 / 1	1 / 1
TOTAL COST		
MANUFACTURER		
MODEL OR FIG. NO.		
VENDOR		
P/O (8 ITEM) NO.	P-104 / 5.13, 5.14	P-104 / 3.27, 3.28 
FOREIGN PRINT NO.		
WELD END DNG. REFERENCE	8031-P-300, SHEETS 72 & 75	
P & I DIAGRAM REF.	M-55	M-55
LOCATION DNG. REF.		
(1) SEISMIC ITEM	YES	YES
REMARKS	(1) REFER TO 2.3.3 OF SPEC. 8031-P-350	



VALVE DATA SHEET
MOTOR OPERATED
LIMERICK GENERATING STATION UNITS 1 & 2
PHILADELPHIA ELECTRIC COMPANY

ATTACHMENT TO
M/R NO.
8031-P-104
SHEET 19 OF 22
REV. 16

DATE	APPROVALS	MATERIAL	SUPERVISOR	CHECKED	DRAWN	ENGINEER	DESCRIPTION	VALVE NO.			
								DBA-GB-F-N-41-1017 & 2017	DBA-GB-N-41-1016 & 2016	DBA-GB-F-N-41-1026 & 2026	
9-14-74								REACTOR WATER CLEAN-UP SYSTEM	REACTOR WATER CLEAN-UP SYSTEM	MAIN STEAM DRAIN HDR	
4-13-79								GLOBE	GLOBE	GLOBE	
4-12-79								DBA-112, 212	DBB-112, 212	DBA-105, 205	
								DBA	DBA	DBA	
								4"	4"	3"	
								WATER	WATER	STEAM/CONDENSATE	
								1400 / 1540	1777 / 2132	1250 / 1337	
								582 / 582	459 / 459	582 / 582	
								480 GPM	480 GPM	506 GPM	
								900 #	996 #	900 #	
								SCH 80 B.W.	SCH 120 B.W.	SCH 160 B.W.	
								SA 216 GR WCB OR	SA-105		
								STELLITE			
								J.C. 187-I			
								PRESSURE SEAL			
								INTEGRAL OR RENEWABLE			
								PLUG OR CONE			
								OPER DIFF. PRESS (MAX)	1540 PSI	1540 PSI	1250 PSI
								MAX. SEC. TO OPEN/CLOSE	NA	NA	NA
								LOCATION @ AMB. TEMP	SEE DESIGN SPEC	8031-P-104	
								IN CONTAINMENT - YES/NO	YES	NO	YES
								SAFETY RELATED - YES/NO	YES	YES	YES
								SEISMIC CAT. 1 - YES/NO	YES	YES	YES
								THROTTLING SERVICE - YES/NO	NO	NO	NO
								TORQUE BACK SEATING - YES/NO	NA	NA	NA
								TORQUE OUTPUT MAX (MAX)	NA	NA	NA
								REMOTE POSITION INDICATOR	NONE	NONE	NONE
								FAIL SAFE MODE: Open/Clsd/Lkd	NA	NA	NA
								OPERATOR			
								MANUFACTURER *			
								MODEL *			
								WEIGHT (LBS) *			
								VALVE			
								WEIGHT (LBS) *			
								Cv VALUE *			
								MANUFACTURER *			
								MODEL OR FIG. NO. *			
								VENDOR *			
								P/O (8 ITEM) NO.	P-104 / 23.1	P-104 / 23.1	P-104 / 23.2
								FOREIGN PRINT NO. *			
								WELD END DWG. REFERENCE	8031-P-300 SHEETS 72 & 75		
								P & I DIAGRAM REF.	M-41	M-41	M-41
								LOCATION DWG. REF.			
								NO. REQ. UNIT 1 / UNIT 2	1 / 1	1 / 1	1 / 1
								REMARKS *	TO BE COMPLETED BY THE VENDOR		

12 REVISED AS MARKED
 14 REVISED AS MARKED
 13 ISSUED FOR CONSTRUCTION



TPO

VALVE DATA SHEET
 LIMERICK GENERATING STATION
 UNITS 1 & 2


JOB 8031

ATTACHMENT TO
 M/R 8031-P-104

REV.

15

DATE	APPROVALS	MATL	SUPV	CHK	DR	ENG	DESCRIPTION
							16
							Mo-41-142, 143
							Mo-41-242, 243
							VALVE NO.
							SERVICE
							VALVE TYPE
							LINE OR EQUIPMENT REF.
							VALVE CLASS
							SIZE
							COMMODITY
							DESIGN/MAX. PRESS.
							DESIGN/MAX. TEMP.
							FLOW
							VALVE RATING
							TYPE ENDS/RATING
							BODY MATERIAL
							TRIM MATERIAL
							PACKING
							TYPE BONNET
							TYPE OF SEATS
							TYPE OF DISC
							ACTUATOR
							OPER. DIFF. PRESS (MAX)
							MAX. SEC. TO OPEN/CLOSE
							LOCATION @ AMB. TEMP
							IN CONTAINMENT - YES/NO
							SAFETY RELATED - YES/NO
							SEISMIC CAT 1 - YES/NO
							THROTTLING SERVICE - YES/NO
							TORQUE BACK SEATING - YES/NO
							TORQUE OUTPUT MAX (MAX)
							REMOTE POSITION INDICATOR
							FAIL SAFE MODE: Open/Clsd/Lkd
							ELECTRIC MOTOR: Hz OR DC
							NORMAL VOLTAGE
							MINIMUM VOLTAGE
							MAXIMUM VOLTAGE
							AIR MOTOR
							NORMAL SUPPLY PRESS.
							MINIMUM SUPPLY PRESS.
							CLASS I (IEEE)
							MANUFACTURER
							MODEL OR FIG. NO.
							VENDOR
							P/O (& ITEM) NO.
							FOREIGN PRINT NO
							WELD END DWG. REFERENCE
							P & I DIAGRAM REF.
							LOCATION DWG. REF.
							No Req'd: Unit 1/Unit 2
							ACTIVE YES/NO
							REMARKS
							* SPEC P-354

 TPO	VALVE DATA SHEET MOTOR OPERATED		JOB NO. 8031	REV.
	LIMERICK GENERATING STATION UNITS 1 & 2 PHILADELPHIA ELECTRIC COMPANY		Attachment to M/R No. 8031-P-104	16
			SHEET 21 OF 22	

M-323-E
3-19-74

REV.	DESCRIPTION	DATE	MO-55-2F105	MO-55-1F105
20	revised as marked	9-15-81		
19	changed item 29.1 to 2F105 added item 4.26	6-2-82		
21	Deleted item 29.1 (All in exception paragraph 20)	6-7-82		
			Item 29.1 Deleted	
			PUMP DISCHARGE VALVE	Pump Discharge Valve
			TO FW LINE	to FW line
			Gate	Gate
			DBB-103	DBB-103
			DBB	DBB
			8"	8"
			WATER	Water
			1777/2132	1777/2132
			459/459	459/459
			3600 gpm (MAX) / 3600 gpm (MIN)	3600 gpm
			900 # ASME	900 # ASME
			BW/120	BW/120
			SA 216 GR WCB / SA 105	SA 216 GR
			Stellite	Stellite
			CINCO 187-I or approved equal	
			Pressure Seal	
			integral or renewable	
			Fly-wedge	
			1625 PSIG	
			20	
			SEE DESIGN SPEC.	
			NO	
			YES	
			YES	
			NO	
			NO	
			LIMIT SWITCH	
			DC	
			240V	
			270V	
			192V	
			YES	
			YES	
			H	
			P-104/29.1	4.26
			5PC P-300 Sheets 72+75	
			11-55	
			Helb YES/NO	
			** YES	
			* Refer to paragraph 20 of design specification 8031-P-104	
			** Refer to par. 3.4 Des. Spec. 8031-P-104 appendix 3	



TPO

VALVE DATA SHEET
MOTOR OPERATED

Himerick Generating Station Units 1+2
Philadelphia Electric Co.

JOB NO. 803/
Attachment To
M/R No.
8031-P-104
SHEET 22 OF 22

REV.
21

Reg. Guide 1.48

Valve Operability Test Requirements

- 20.1 Certain of the "active" valves, specified herein, shall be tested for operability during a postulated seismic disturbance, the test being conducted in conformance with the following general conditions.
- 20.1 The valve shall be placed in a suitable test stand with pipe lengths attached to each end of the valve by the same method as in actual installation, i. e. welded for weld end valves, flanged for flanged end valves. The pipe lengths attached shall be at least 12" long or a length equal to the pipe nominal diameter, whichever is longer. The attached pipe lengths shall be rigidly attached to the test stand, preferably by welding. The valve actuator and all other appurtenances shall be mounted on the valve as in a normal plant installation. The valve shall be oriented in the test stand such that the external loads applied impose the most adverse conditions for valve actuation.
- 20.2 The valve shall be internally pressurized to the maximum operating pressure as specified in the Valve Data Sheets, (Attachment to the procurement documents), and concurrently a static resultant load (the specified "g" force times the weight of the topworks) shall be applied to the center of mass of the topworks, in the direction of the weakest axis of the yoke, simulating the maximum acceleration load. The "g" value to be used to establish the maximum acceleration load is listed in the table and is the "maximum" "g" "force" sustainable by the valve as derived by the analysis made specifically to determine this force. For the opening cycle on a gate valve, the pressure shall be applied in a manner which establishes the maximum specified differential pressure across the disc. For globe valves and all other valve cycling the valve body shall be internally pressurized to the specified value.
- 20.3 The valve shall then be actuated, using minimum actuator supply as defined in the Valve Data Sheet. The valve shall be operated through two full cycles, a cycle being defined as closed-to-open-to-closed, or vice versa. The valve shall move to the safety related position within the time specified in the Valve Data Sheets. In addition, if any evidence of irregular stem movement or abnormal operation is observed, Bechtel engineering shall be contacted for guidance.

- 20.4 In the event that the valve fails to meet the operability test at "Maximum 'g'", the test for that valve shall be increased in scope to establish a value of "Max 'g'" which the valve can withstand.
- 20.5 Subsequent to the completion of the valve functional test, the seat leak test, as outlined in the valve Technical Specification hydrostatic test section, shall be repeated.
- 20.6 The format for documenting this Operability Test is left optional with the Seller, but the information recorded shall include at least the following:
1. Test result: satisfactory or unsatisfactory.
 2. Valve identification: P.O. No., Item No. Tag. No.
 3. Internal test pressure-psig
 4. Lateral applied load: Pounds (max "g" value times the weight of the valve topworks)
 5. Air supply pressure (air operators) - 80 psig
 6. Applied Motor voltage (Minimum Voltage to be 80% of rated voltage 460V = 368V)
 7. Cycle time under load
 8. Post-test seat leak rate
 9. List of test equipment used including serial numbers and calibration date.
- 21.0 Test data shall be submitted to and approved by the Buyer prior to acceptance of valve for shipment.
- 22.0 Subsequent to satisfactory completion of the test and Buyer's approval of the test data, the Seller shall remove the stub-end pipes, re-machine the valve weld ends and otherwise restore the valve to original condition and shall validate his original warranty.
- 23.0 The supplier shall submit to the Buyer for approval, procedures to be used for the functional testing noted above. The procedures shall include all pertinent requirements and sample copies of documentation to be supplied.

Note: These requirements are to be considered general. Test procedures with exceptions will be approved on a case by case basis.

Max-"G" Force Table Attachment 4 to
 MIR 8031-P-104
 Page 1

O.	Item #	Max G	Velaw Report #
D104BC	1.4	8.8	SR6594
	3.10	11.8	SR6589
	3.26	6.5	SR6590
	4.2	6.5	SR6590
	4.28	7.2	SR6579

Max "G" Force table

P.D.	ITEM #	Max "G"	Report #		COMMENTS
P104CC					
	5.10	13.31	81.204		
	5.8	11.36	81.203		
	6.8	7.72	81.206		
	21.4	4.66	81.207		
	22.4	4.56	81.208	△ 23	

ATTACHMENT 5 TO MATERIAL REQUISITION
QUALITY SURVEILLANCE REQUIREMENTS

1.0 SCOPE

This Attachment details the responsibilities with regard to the quality surveillance of material/equipment covered by this MR and outlines the responsibilities and activities of Bechtel Supplier Quality Representative (SQR).

2.0 RESPONSIBILITY

The Supplier has the prime responsibility for implementation of the quality program, as well as for proper manufacture, inspection and testing of all material and work prior to its presentation to the Bechtel SQR. The performance (or waiver) of quality surveillance activities by the Owner, Bechtel, or their representatives, does not relieve the Supplier of any obligations to perform in accordance with all requirements of the procuring documents.

3.0 BECHTEL SQR ACTIVITIES

The Bechtel SQR is to be allowed free access to all areas where work involving this order is in progress. This includes access necessary to verify the implementation of all aspects of the quality program as well as access to sub-suppliers' facilities.

Quality surveillance by the Bechtel SQR of material/equipment produced under this MR shall include, but not be limited to the Witness and Hold Points listed in attached Tables 1 and 2. Additional Witness and Hold Points may be established by the Bechtel SQR if manufacturing or related activities warrant.

4.0 WITNESS POINTS

Witness Points are critical steps in manufacturing and testing where the Supplier is obligated to notify the Bechtel SQR at least five (5) days in advance of the start of operation/test so that it may be witnessed. The Supplier may proceed with the work past a witness point if the Bechtel SQR is not available at the appointed time.

5.0 HOLD POINTS

Hold Points are critical steps in manufacturing and testing where the Supplier is obligated to notify the Bechtel representative at least five (5) days in advance of the start of operation/test so that it may be witnessed. Final release prior to shipment is also a hold point. The Supplier may not proceed with the work past a hold point except by written waiver/agreement by the Bechtel SQR.

6.0 INITIAL QUALITY SURVEILLANCE VISIT

6.1 The Supplier shall furnish to the Bechtel SQR the names and addresses of sub-suppliers with description of the work to be subcontracted, when it falls under either of the following categories:

- 1) Custom fabricated equipment involving fabrication, operation, examination or testing, that will ship directly to the jobsite, from the sub-supplier's plant. (This does not include standard off-the-shelf equipment.)
- 2) Custom fabricated equipment that will ship to the prime supplier for further assembly and inspection, but where the fabrication, operation, examination or testing specified to be witnessed are performed at the sub-supplier's facilities and will not be repeated in the prime supplier's shop. (This does not include standard off-the-shelf equipment.)

7.0 PROGRESSIVE QUALITY SURVEILLANCE VISITS

7.1 The Supplier shall provide evidence to the Bechtel SQR that all engineering documents requiring Bechtel review, as shown on G-321-E Form, are Status Code 1 prior to release for shipping. Any exceptions require Bechtel approval.

7.2 The Supplier's quality verification documentation package with the G-321-V Form as a cover sheet, shall be presented to the Bechtel SQR for review, signature and dating, prior to granting a release for shipping. Missing, incomplete, or incorrect documentation shall be treated as a non-conformance and may be cause for denying the Supplier permission to release the items for shipment.

7.3 The Supplier's quality verification documents that do not require submittal to Bechtel and/or the Owner shall be available to the Bechtel SQR for review and verification. These documents shall be retained by the Supplier as required by the applicable standard or code, but in no case shall this time be less than the end of the warranty period.

TABLE 1

The following Bechtel Supplier Quality Surveillance Witness and hold points are required:

Witness Points

<u>Valve Part or Assembly</u>	<u>Operation, Test, or Examination</u>
Pressure boundary parts, welds and hardfacing	In-process non-destructive examinations on a first operation basis for each examination required by the procurement documents and referenced ASME Code, Section III.
Welds	Fit up and welding on a first operation basis for each Bechtel approved procedure
Forgings, castings and welds	Heat treatments on a first operation basis for each Bechtel approved procedure
Pressure boundary parts and welds	Major weld repairs*

* A major weld repair is defined to be repair of defects which exceed the lesser of 3/8 inch or 10% of the section thickness.

Hold Points

<u>Valve part or Assembly</u>	<u>Operation, Test, or Examination</u>
Casting and welds	Review and signoff of all completed radiographs
Assembled valve	Hydrostatic test **
Assembled valve	Seat leak test **
Completed valve	All functional and operational tests Final inspection for materials of construction, dimensions, general workmanship, cleanliness, marking, tagging, and preparation for shipment
Supplier's quality verification documents	Review and signoff for completeness and accuracy

** Hold point first operation basis only; balance to be witness points.

TABLE 2A

Valve Operability Test Hold Points

Assembled Valve	Valve Operability Test Verify test pressure, applied test load, and cycling of valve, seat leak test
Supplier's quality verification documents	Review and signoff for completeness and accuracy

ENCL (5)

DESIGN SPECIFICATION

FOR
 Nuclear Service C.S. Gate, Globe + Check Valves
 500# ANSI Rating and Higher, 2 1/2" and Larger

FOR THE

LIMERICK GENERATING STATION

UNITS 1 & 2

PHILADELPHIA ELECTRIC COMPANY

Bechtel Power Corporation

San Francisco, California

CERTIFICATION:

I, the undersigned, certify that this Design Specification covers the requirements of the ASME Boiler and Pressure Vessel Code, Section III, Subsubparagraph N A 3250.

<u>Signature</u>	<u>Date</u>	<u>Revision</u>
<i>Mark Schletz</i>	5-20-82	7
<i>Mark Schletz</i>	2-2-82	8
<i>Mark Schletz</i>	4-28-83	9

Reviewed to ASME Section III-1971 Edition with Winter 72 and Summer 73 Addenda and ASME Section III-1974 Edition including the Winter 74 Addenda and Code Cases 1516-2, 1567, 1622, & 1682.



NO.	DATE	REVISIONS	APPROVALS
⑨	5/3/83	REVISED SHTS. 11, A3-6, & A15-1 AS NOTED.	RBA [Signature]
⑧	8/19/82	Revised as shown on sheet i	[Signature]
⑦	5/25/82	Revised as shown on sheet i	[Signature]

DESIGN SPECIFICATION
FOR
NUCLEAR SERVICE C.S. GATE, GLOBE & CHECK VALVES
600# ANSI RATING & HIGHER, 2½" & LARGER
FOR THE
LIMERICK GENERATING STATION
UNITS 1 & 2
PHILADELPHIA ELECTRIC COMPANY

Bechtel Power Corporation
San Francisco, California

CERTIFICATION:

I, Clyde H. Nichols, certify that the information listed in Appendix 1 herein, which is specifically required to be furnished in accordance with ASME Boiler and Pressure Vessel Code, Section III, Division 1, Paragraph NA-3250, is correct and complete.



<i>Clyde H. Nichols</i>	APRIL 16, 1976
Signature	Date
<i>Clyde H. Nichols</i>	1/18/77
<i>Clyde H. Nichols</i>	3/24/77

NO.	DATE	REVISIONS	APPROVALS
6	3-2-77	REVISED AS SHOWN ON SHEET I	[Signature]
5	1-21-77	REVISED AS SHOWN ON SHEET I	[Signature]
4	4-14-76	REVISED AS SHOWN ON SHEET I	[Signature]

* CONTINUATION SHEET TO FOLLOWING PAGE.

DESIGN SPECIFICATION
 FOR
 NUCLEAR SERVICE, CARBON STEEL GATE, GLOBE
 AND CHECK VALVES, 600# RATING AND HIGHER,
 2½" AND LARGER
 FOR THE
 LIMERICK GENERATING STATION
 UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

BECHTEL POWER CORPORATION
 SAN FRANCISCO, CALIFORNIA

CERTIFICATION:

I, **Robert S. Powell**, certify that this design specification covers the design requirements with respect to (1) function, (2) mechanical and operational loadings including vibration and shock, (3) environmental conditions, including radiation, and (4) the classification of the component as determined by its function and operating conditions, all as prescribed by Section III, Nuclear Power Plant Components, of the ASME Code.



Robert S. Powell 8.6.75
 Signature Date

NO.	DATE	REVISIONS	APPROVALS
△			
△			
③	7-15-75	REVISED AS SHOWN ON SHEET 2	

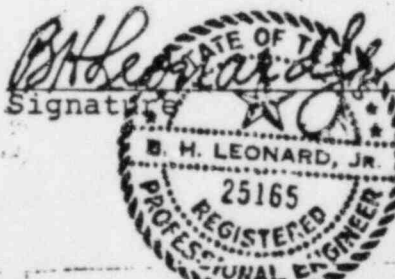
* CONTINUATION SHEET TO FOLLOWING PAGE.
 REVISIONS CONTINUED ON PRECEDING PAGE.

DESIGN SPECIFICATION
 FOR
 NUCLEAR SERVICE C.S. GATE, GLOBE & CHECK VALVES
 600# ANSI RATING & HIGHER, 2½" & LARGER
 FOR THE
 LIMERICK GENERATING STATION
 UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

Bechtel Corporation
 San Francisco, California

CERTIFICATION:

I, B.H. Leonard, Jr., certify that this design specification covers the design requirements with respect to (1) function, (2) mechanical and operational loadings including vibration and shock, (3) environmental conditions, including radiation, and (4) the classification of the component as determined by its function and operating conditions, all as prescribed by Section III, Nuclear Power Plant Components, of the ASME Code.



 Signature: *B.H. Leonard, Jr.* Date: *7/31/72*


△	1-7-74	REVISED AS MARKED	<i>[Signature]</i>	
△	9-20-72	ADDED PARA. 12.0 TO APPENDIX 3	<i>[Signature]</i>	<i>CND</i>
△	8-14-72	ISSUED FOR CONSTRUCTION	<i>[Signature]</i>	<i>CND</i>
NO.	DATE	REVISIONS	APPROVALS	

* REVISIONS CONTINUED ON PRECEDING PAGE











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i	9	A15-5	0	APPENDIX 8									
ii	9	A15-6	0	SHT.									
iii	0	A15-7	0	75 116									
A1-1	0	A15-8	0										
A1-2	0			APPENDIX 9									
A2-1	0			SHT.									
A3-1	7			72.1	14								
A3-2	7			72.2	3								
A3-3	5			72.3	14								
A3-4	6			72.4	12								
A4	3			72.5	7								
A5-1	5			72.6	14								
A5-2	5			72.7	14								
A5-3	5												
A5-4	5												
A5-5	5												
A3-5	4												
A5-6	8												
A3-1A	8												
A3-1B	7												
A3-6	9												
A15-1	9												
A15-2	0												
A15-3	0												
A15-4	0												

5	2-27-77	REVISED SHEETS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100				6	2-11-77	REVISED SHEETS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100					
4	4-14-76	REVISED SHEET A3-2 ADDED NEW CERTIFICATION				7	5/5/77	REVISED SHEETS A3-1, A3-2 added A3-6, A15-1, A15-2					
3	7-15-75	REVISED SHEETS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100				8	8/19/82	REVISED A3-1A, 1B, A5-6					
2	1-7-74	REVISED SHEETS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100				9	5/3/83	REVISED SHEETS 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, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100					
1	7-20-72	ADDED A3-4											
0	8-14-72	ISSUED FOR CONSTRUCTION											

NO.	DATE	REVISIONS	BY	CHK'D	APP'D	NO.	DATE	REVISIONS	BY	CHK'D	APP'D
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 POWER AND INDUSTRIAL DIVISION	FACING SHEET LIMERICK GENERATING STATION, UNITS 1 & 2 PHILADELPHIA ELECTRIC COMPANY Design Specification 8031-P-104	JOB No 8031	REV. 9
	Sheet i		

CONTENTS

- I. Preface, Rev. 0
- II. Specification for Nuclear Service Valves, 8031-P-350, Rev. 8 | 
- III. Appendices:
1. ASME Criteria Locator, Sheets A1-1, Rev. 0 & A1-2, Rev. 0
 2. ASME Procedural Requirements, Sheet A2-1, Rev. 0
 3. Supplementary Criteria and Information for Valves,
Sheets A3-1, Rev. 7, A3-2, Rev. 7, A3-3, Rev. 5
A3-4, Rev. 6, A3-5, Rev. 4, A3-1A, Rev. 8, A3-1B, Rev. 7
A3-6, Rev. 9 | 
 4. Form G-321-C Rev. 3, Drawings and Data Requirements
 5. Form 8031-QA, Sheets A5-1, A5-2, A5-3, A5-4, A5-5,
Rev. 5, Sheet A5-6, Rev. 8 Quality Assurance Documentation
Distribution Requirements | 
 6. Specification 8031-G-1, Rev. 11, General Project Require-
ments for Purchase Orders | 
 7. Specification 8031-G-13, Rev. 8, General Project
Requirements for Quality Assurance | 
 8. Weld End Transition for Valves, Sheet 75, Rev. 16 of
Specification 8031-P-300. | 
 9. Weld End Preparation, Sheet(s) 72-1, Rev. 14; 72.2, Rev. 3;
72.3, Rev. 14; 72.4, Rev. 2; 72.5 Rev. 7; 72.6 & 72.7,
Rev. 14 of Specification 8031-P-300. | 
 10. Bechtel Standard Form 79, Rev. 4/68
 11. Bechtel Standard Form 3295 (11-71) - Statement of
Conformance
 12. Specification 8031-G-11, Rev. 17, General Project
Requirements for Valve Motor Operators | 
 13. Specification 8031-G-4, Rev. 8, General Project
Requirements for Shop Painting for Mechanical and
Electrical Equipment | 
 14. Bechtel Form ED-27 (SDDR)
 15. Dynamic Qualification and Functional Testing
Requirements ASME III Valves | 

I. PREFACE

This Design Specification consists of design information as prescribed by Section III of the ASME Codes and of design information that is not specifically related to the Code. Of necessity, the two categories are interspersed.

For those primarily concerned with ASME criteria, such as enforcement authorities, reference should be made to Appendix No. 1, "ASME Criteria Locator", which identifies that information prescribed by the Code.

The particular valves to be furnished in accordance with this Design Specification and that design information which is subject to change are included in the associated Purchase Order, and, by reference, are part of this Design Specification.

APPENDIX 1ASME CRITERIA LOCATOR

I. GENERAL	Document/Para. No.
(a) Functions of the components or appurtenances including any dimensions upon which the functional performance depends.	App. 3
(b) Seismic tests or calculations	Spec. P-350, Para 2.3.3
(c) Environmental Conditions, including radiation	App. 3, Para 3.0
(d) Code classification	See M/R, Identification
(e) Definition of the component and piping boundaries	Appendix 3
(f) Procedure for review and certification of the Stress Reports	Appendix 2
(g) Procedure for handling various Data Reports particularly with respect to transmittal to enforcement authorities	Appendix 2
(h) Certification of the Design Specifications	Title Page
 II. MATERIALS	
(a) Hydrostatic testing	Spec.P-350, Para. 9.0
(b) Requirements with respect to cleanliness	Spec.P-350, Para. 11.0
(c) Requirements for heat treatment	Spec.P-350, Para. 7.0

APPENDIX 1

III. DESIGN AND OPERATING CONDITIONS	Document/Para. No.
(a) Design pressure and temperature	Valve Data Sheet and App. 3
(b) Thermal transients	Appendix B to Spec. P-350
IV. Marking, identification, crating and shipping requirements	Spec. P-350, Paras. 11.0 & 13.0

APPENDIX 2

ASME SECTION III

PROCEDURAL REQUIREMENTS

I. Stress Report

Review and Certification of Stress Report.

Two copies of the certified Stress Report required for Class 1 components by Paragraph NA-3352 of Section III shall be submitted to the Buyer, and one copy shall be made available to the authorized inspector.

II. Data Report

The Manufacturer shall send one copy of the Data Report directly to his authorized inspector and two copies to the Buyer's Project Superintendent. One of the latter copies will be sent to the enforcement authority at the job site.

APPENDIX 3

SUPPLEMENTARY CRITERIA AND
INFORMATION FOR VALVES

GENERAL REQUIREMENTS

1.0 Motor Operated Valves

- 1.1 All motor operated globe valves shall be considered "throttling service valves" and their operators shall be designed to maintain the valves at any intermediate position without drifting.
- 1.2 All motor operators must be sized to open and close the valve at the speeds indicated on the valve data sheets against the Actuator Operation Pressure Differential (ACT. OP. DIFF. PRESS. (MAX), as listed on the valve data sheets) across the valve.

2.0 Position Switches

All air operated valves and valves marked with the exception letters "ZS" shall be equipped with 2-DPDT position switches with inductive load interrupting rating of at least 10 amp at 125-V AC or 1/2 amp at 125-V DC to indicate "FULL OPEN" and "FULL CLOSED" positions. The switch enclosure shall be NEMA 4, watertight.

Deleted

3.0 Environmental Condition

The valves shall be designed for the environmental conditions listed below.

3.1 Unless otherwise stated, valves shall be assumed located indoors and outside the drywell.

3.2 Normal Environmental Conditions (40 Years):

3.2.1 Outside Primary Containment

Temperature: 65°F min. to 120°F Max.
Pressure: 1/4" w.g. to atmospheric
Relative humidity: 50% ave. to 90% max.
Radiation: 1.35×10^6 rads (total integrated dose for 40 years).

3.2.2 Inside Primary Containment

Temperature: 65°F min. to 120°F Max.
Pressure: Atmospheric to .75 psig.
Relative humidity: 20% min. to 100% max.
Radiation: 1.37×10^7 rads (total integrated dose for 40 years).

3.3 Accident Conditions (180 days)

3.3.1 Outside Primary Containment

Temperature: 120°F
Pressure: Atmospheric
Relative humidity: 100%
Radiation: 4.8×10^6 rads gamma
and 1.38×10^6 rads beta

3.3.2 Inside Primary Containment:

Temperature: 340°F
Pressure: 44.0 psig
Relative humidity: 100%
Radiation dose: 5.91×10^7 rads gamma,
 1.18×10^8 rads beta

3.4 HELB

Valves outside primary containment exposed to HELB conditions shall be exposed to the following additional conditions.

Temperature: 511°F
Pressure: 9.9 psig.

3.5 Individual valves may be exposed to different environmental conditions as noted.

APPENDIX 3

Deleted

4.0 General Descriptions

Nuclear carbon steel valves, 2½" and larger, 600# rating or higher.

Butt weld ends; pressure seal bonnet or cap; O.S.&Y. for gate and globe valves; flexible wedge disc on sizes 4" and larger; swing or tilting disc on all check valves.

5.0 Materials

Bodies, Bonnets and Discs - Cast Carbon Steel, ASME SA-216 Gr. WCB, Forged Carbon Steel, ASME SA-105 Gr. II, ASME SA-105.

NOTE: Materials are not required to be impact tested.

Stellited seating surfaces, other trim suitable for steam and water conditions within the limits of the pressure rating.

6.0 Weld End Transition and Preparation

Weld end transitions for valves shall be in accordance with "Type I" as shown in Specification 8031-P-300, Sheet 75. Ends shall be machined to match the Sch. pipe noted and configurations shown in Specification 8031-P-300, Sheet 72.

7.0 Design Pressure and Temperature7.1 All Items Except Those Marked with Exception Letter 'X'

Design pressure and temperature for motor and air operated valves are listed on the valve data sheets. For manually operated valves, design pressure and temperature for Class 1 valves, are listed on the valve data sheets and for Nuclear Classes 2 and 3 they shall not exceed the pressure-temperature ratings as listed in ASME Code, Section III, 1971 edition.

APPENDIX 37.2 Items Marked with Exception Letter 'X'

Use of MSS-SP-66 for design of these valves is permitted in accordance with NC-3512 or ND-3512. Under item description of these items, maximum operating pressure and temperature are listed. These conditions may exist in the piping where the valve is installed during 1% of the operating time or less and NC-3612.3 applies to the design of this piping.

8.0 Statement of Conformance for Q-Listed Items

The attached Form 3295 (11-71), listed as Appendix 11 on Sheet ii, shall be completed by the Buyer's inspector and signed by the Seller at time each shipment, or partial shipment of nuclear valves and their accessories, is ready to go forward from the Seller's facility. All nuclear valves are considered Q-Listed items.

9.0 Stop Check Valves

These valves shall be designed to normally function as check valves, but in addition are provided with means for positive shut off, using manual or mechanical actuators.

10.0 Corrosion Allowance

10.1 For Nuclear Class 1 valves, the valve body thickness shall include the following corrosion allowance as per Para NB-3541 of ASME Sec. III, 1971 edition.

Class 1 valves - 0.080" for all items in water service
0.120" for all items in steam service

10.2 For Nuclear Class 2 & 3 valves, the valve body thickness shall include the following corrosion allowance:

Class 2 & 3 valves - 0.080" for all manual valves.
0.080" for all motor and air operated valves in water service
0.120" for motor and air operated valves in steam service

11.0 DELETED

APPENDIX 312.0 POWER ASSIST CHECK VALVES, ITEMS 11.1 & 11.2

During normal operation, a spring loaded piston operator will be held open by air pressure. To insure that there is no accidental loss of air pressure, these operators will be connected to a critical air supply.

Upon a loss of water incident, the valve shall tightly shut as a normal check valve, and, in addition, the control room operator will assist in starting valve closure by sending a remote signal to open a fail-open solenoid valve releasing air pressure from the operator cylinder. All signal wiring will be furnished by others.

13.0 Storage Preparation13.1 Stem Packing

The wet stem packing shall be removed to prevent stem pitting. The new packing shall be identified and attached to the valve in a protective package.

13.2 Painting

The exterior surfaces of carbon steel valves, except for weld end preparations shall be primed with the vendor's standard shop primer.

13.3 Operators

The motor operators shall be painted per 8031-G-4, Para. G-4.3.2 OR G-4.3.3.

13.4 Storage

The valves shall be prepared and crated per paragraphs 11.2 and 13.2 of Specification 8031-P-350 to protect the valves during shipping and storage.

14.0 Deviation Requests

Deviation requests are to be submitted to Bechtel Project Engineering on Bechtel Form ED-27* for review and approval. A copy of the deviation request and the Bechtel Project Engineering reply are to be included in the documentation package for the affected item (or valve).

* AN ALTERNATE FORM PRESENTING EQUIVALENT INFORMATION MAY BE USED.

15.0 Drains

Underseat drains are no longer required for valves 12" and larger in size unless specifically required by Bechtel Project Engineering. Valves that already have drains installed are acceptable provided the approved outline drawing shows the drain.

16.0 Valves Requiring Drains - Items 21.1 - 21.4, 22.1 - 22.4

These valves are to be supplied with a 1" NPS drain on the upstream side of the valve. Drains are to be per para. 4.6 of Specification 8031-P-350.

17.0 Stop Check Valves, Items 14.1 & 14.2

These valves shall be designed to normally function as check valves. During normal operation, a spring loaded piston operator will be held open by air pressure. Upon accidental loss of operator air pressure, the valve shall stay open.

Upon a loss of water incident, the valve shall tightly shut, and in addition, a positive means of shut-off can be obtained by venting operator air pressure.

18.0 D.C. Valve Operators, Items 3.9, 3.10, 3.19-3.26, 5.7-5.10, 21.3, 21.4, 22.3, 22.4

Terminal blocks on these operators shall be suitable for connection to wire sizes up to #2 AWG for motor power leads.

19.0 Special Seismic IIA Valves, Items 16.1, 16.2, 17.1 & 17.2

Valves having operators or similar features of extended proportions shall be able to withstand an inertial load of 3.0g in any direction in addition to the normal operating loads; the extended parts of the valves shall have a frequency of vibration greater than 33 cps. Fulfillment of this requirement shall be demonstrated either by tests or calculations. In either event, copies of the test data or calculations shall be submitted for approval by the Buyer prior to shipment of the valves.

20.0 Maximum Inertial Load Analyses

This paragraph supersedes para. 2.3.3 of Spec. 8031-P-350 and supplements the requirements of Appendix 15. Valves identified in the valve descriptions shall be capable of operation during and after loading due to combined hydrodynamic and seismic forces. Vendor shall provide the maximum inertial load capabilities of the valve and its extended portions determined by either test or analysis, which in all cases must be greater than 4.5 g's in both horizontal and vertical axes in addition to the normal operating loads. The extended portions of the valves shall be designed to have a frequency of vibration greater than 100 cps whenever possible. However, in no case shall the first natural frequency be less than 33 cps. In either case, the first natural frequency shall be reported to the Buyer.



DESIGN SPECIFICATION 8031-P-104

This schedule of drawing and data requirements is to be fulfilled before rendering final invoices. See below for drawings required and dates due. Failure of Seller to comply with drawing and data requirements may result in order cancellation in the case of initial drawings, or final payment being withheld in the case of final drawings. Drawings are to be forwarded to:

BECHTEL CORPOPATION • Power & Industrial Division • P. O. Box 3965 • San Francisco, California 94119

Attention: W.C. McDermott

IN ADDITION, FORWARD WITH SHIPMENT, ONE SET OF ANY DRAWINGS NECESSARY FOR FIELD INSTALLATION. FORWARD COPY OF LETTER OF TRANSMITTAL TO: BECHTEL CORPORATION, PROCUREMENT DEPARTMENT, P. O. BOX 3965, SAN FRANCISCO, CALIFORNIA 94119, ATTENTION: EXPEDITOR NAMED ON PAGE 1 OF PURCHASE ORDER.

7-16-75
 1-7-74
 8-14-72
 3 Revised as Marked
 2 REVISED AS MARKED
 0 ISSUED FOR CONSTRUCTION
 B-321-C 8/13/68
 BECHTEL
 POWER AND INDUSTRIAL DIVISION

DATE
 APPROVALS
 MATL.
 SUPV.
 CHK.
 DR.
 ENG.
 DESCRIPTION

TYPE OF DRAWINGS AND OTHER REQUIREMENTS	APPROVAL BEFORE FAB (YES/NO)	KIND OF COPIES	NUMBER REQUIRED	
			INITIAL	FINAL
A OUTLINE DIMENSIONS AND FOUNDATION REQUIREMENTS	Yes	TRANSPARENCY PRINTS	1 1	1 1
B CROSS SECTION WITH PARTS LISTS WITH PRICES	Yes	TRANSPARENCY PRINTS	1 1	1 1
C SHOP DETAIL DRAWINGS		TRANSPARENCY PRINTS		
D CERTIFIED PERFORMANCE DATA AND TEST REPORTS	*	TRANSPARENCY PRINTS		
E WIRING DIAGRAMS	Yes	TRANSPARENCY PRINTS	1 1	1 1
F CONTROL LOGIC DIAGRAMS		TRANSPARENCY PRINTS		
G WELDING PROCEDURES	*	TRANSPARENCY PRINTS		
H CODE CERTIFICATES, INSPECTION AND TEST REPORTS	*	ORIGINAL COPIES		
J INSTRUCTIONS FOR ERECTION OR INSTALLATION, OPERATION AND MAINTENANCE	NO	MANUALS OF EACH TYPE		30
K LIST OF RECOMMENDED SPARE PARTS FOR ONE YEAR'S OPERATION, WITH PRICES	NO	LISTS		6
L COMPLETED BECHTEL CORPORATION DATA SHEETS	Yes	TRANSPARENCY		1
M MATERIAL CERTIFICATIONS	*			
N MANUFACTURERS QUALITY CONTROL, INSPECTION AND TEST PROCEDURES AND REPORTS	*			
O Weld End Preparation Details	Yes	Transparency Prints	1 1	1 1
P List of Valve & Operator Weight		Transparency Prints	1 1	1 1


*See Appendix A to Spec. 8031-P-350 for Q-A Documentation Required

*See Attached Q.A. Documentation Distribution Requirements

Seller's drawings will be reviewed and approved only as to arrangement and conformance to the specifications and related drawings, and approval shall not be construed to relieve or mitigate the Seller's responsibility for accuracy or adequacy and suitability of materials and/or equipment represented thereon.

Final drawings must be certified and must show, adjacent to title block, Buyer's equipment title and number, mfr's serial no. and purchase order number. Final drawings shall be submitted in accordance with paragraph G1.8 of Specification 8031-G-1 or paragraph G2.6 of Specification 8031-G-2.

Initial drawings required within 15 days of receipt of firm order. Final drawings required within 15 days of receipt of initial drawings, or within 30 days of receipt of firm order if no initial drawings are requested.

 <p>BECHTEL POWER AND INDUSTRIAL DIVISION</p>	DRAWINGS AND DATA REQUIREMENTS DESIGN SPECIFICATION 8031-P-104 PHILADELPHIA ELECTRIC COMPANY LIMERICK GENERATING STATION UNITS 1 & 2	JOB NO. 8031 Appendix 4 544. A4	REV. 3
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FOR QUALITY ASSURANCE USE

(A) Mr. W.C.A. Dangle
 Project Engineer
 Bechtel Power Corporation
 P.O. Box 3965
 San Francisco, Calif. 94119

(B) Bechtel Power Corporation
 Limerick Generating Station
 P.O. Box A, Sanatoga Branch
 Pottstown, PA. 19464
 Attention: T.H. Gwin
 Construction Manager



The required certified copies shall be furnished prior to shipment of material.

1-10-74
 1-7-74
 1-18-74
 APPROVALS
 DATE
 SUPP.
 DR
 REV. DESCRIPTION
 2 REVISED AS MARKED
 5 REVISED AS MARKED
 FORM 8031-QA
 POWER AND INDUSTRIAL DIVISION

DATA REQUIREMENTS	REFER TO SPECIFICATIONS PARAGRAPH	KIND OF COPIES	COPIES FOR APPROVAL TO (A) BEFORE FABRICATION	CERTIFIED COPIES	
				TO (A)	TO (B)
1 Qualified Welding and Hard Surfacing Procedures	See Appendix "A" to Specification 8031-P-350	REPRODUCIBLE	1		
		PRINTS	1		
2 List of Qualified Welders		REPRODUCIBLE	1		
		PRINTS	1		
3 QC Non-Destructive Examination and Test Procedures		REPRODUCIBLE	1		
		PRINTS	1		
4 Cleaning Procedures		REPRODUCIBLE	1		
		PRINTS	1		
5 Bending and Heat Treatment Procedures		REPRODUCIBLE	1		
		PRINTS	1		
6 Shipping Preparation Procedures		REPRODUCIBLE	1		
		PRINTS	1		
7 Welding Filler Metal Handling Procedure		REPRODUCIBLE	1		
		PRINTS	1		
8 Proposed QC/QA Program		REPRODUCIBLE	1		
		PRINTS	1		
9 Operational & Hydro Test Reports		REPRODUCIBLE			1
		PRINTS			1
10 Impact Test Results		REPRODUCIBLE			1
		PRINTS			1
11 Critical Dimension Checks	REPRODUCIBLE			1	
	PRINTS			1	
12 Radiographic Film	REPRODUCIBLE			1	
	PRINTS			1	
13 Magnetic Particle Test Results	REPRODUCIBLE			1	
	PRINTS			1	
14 Liquid Penetrant Test Results	REPRODUCIBLE			1	
	PRINTS			1	
15 Ultra Sonic Test Results	Prints			1	
16 Mill Test Reports	Prints			1	
17 Cleanliness Inspection Reports	Prints			1	
18 Repair Procedures	Reproducible	1			
	Prints	1			
19 Deviation Requests	Prints	1		1	
20 Code Data Report Form	Prints			1	

PHILADELPHIA ELECTRIC COMPANY
 LIMERICK GENERATING STATION UNITS 1 & 2

QUALITY ASSURANCE
 DOCUMENTATION DISTRIBUTION
 REQUIREMENTS

Job No. 8031

Design
 Specification
 8031-P-104
 Appendix 5
 Sheet AS-12

REV. 5

FOR QUALITY ASSURANCE USE

(A) Mr. W.C. McDavie
 Project Engineer
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 P.O. Box 3965
 San Francisco, Calif. 94119

(B) Bechtel Power Corporation
 Limerick Generating Station
 P.O. Box A, Sanatoga Branch
 Pottstown, PA. 19464
 Attention: T. L. Quinn Project
 Construction Manager

The required certified copies shall be furnished prior to shipment of material.

12-74
 APPROVALS
 SUPV.
 DR.
 REV. 2
 5
 REVISAS AS MARKED
 REVISAS AS MARKED
 FORM 8031-04

DATA REQUIREMENTS	REFER TO SPECIFICATIONS PARAGRAPH	KIND OF COPIES	COPIES FOR APPROVAL TO (A) BEFORE FABRICATION	CERTIFIED COPIES		
				TO (A)	TO (B)	
1 Certified Design Reports	Appendix "A" to Specification 8031-P-350	REPRODUCIBLE PRINTS		1		
2 Test Data or/and Calculations Demonstrating Suitability for Seismic Loading		REPRODUCIBLE PRINTS		1		
3		REPRODUCIBLE PRINTS				
4 Repair Reports		REPRODUCIBLE PRINTS			1	
5 ALL POST WELD Heat Treatment Charts		REPRODUCIBLE PRINTS			1	
6 Wall thickness Measurement Procedure			REPRODUCIBLE PRINTS	1 2		
7 Certification of Actual Test for Weld Filler Metal			REPRODUCIBLE PRINTS			
8 Radiograph Report			REPRODUCIBLE PRINTS			1
9 Certificate of Compliance			REPRODUCIBLE PRINTS			1
10 Bechtel Std. Form 3295 (11-71)		8:0 in App. 3	REPRODUCIBLE PRINTS			1*
11 Visual Examination Report			REPRODUCIBLE PRINTS			1
12		REPRODUCIBLE PRINTS				
13		REPRODUCIBLE PRINTS				
14		REPRODUCIBLE PRINTS				
15						
16						
17						
18						
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** Form 3295 (11-71) must accompany shipment.
 * For distribution, see footnote on Form 3295 (11-71)

POWER AND INDUSTRIAL DIVISION	PHILADELPHIA ELECTRIC COMPANY, LIMERICK GENERATING STATION UNITS 1 & 2 QUALITY ASSURANCE DOCUMENTATION DISTRIBUTION REQUIREMENTS	Job No. 8031 Design Specification 8031-P-104 Appendix 5 Sheet 45-2	REV. 5
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FOR QUALITY ASSURANCE USE


(A) Mr. W.C. McDaniel
 Project Engineer
 Bechtel Power Corporation
 P.O. Box 3965
 San Francisco, Calif. 94119

(B) Bechtel Power Corporation
 Limerick Generating Station
 P.O. Box A, Sanatoga Branch
 Pottstown, PA. 19464
 Attention: **T. McGWIN**
 Construction Manager

The required certified copies shall be furnished prior to shipment of material.

7-16-78 DATE
 APPROVALS
 SUPV.
 DR
 ENG.
 REV. DESCRIPTION
 5 REVISED AS MARKED
 3 REVISED AS MARKED
 2 REVISED FOR CONSISTENCY

CLASS I (IEEE) MOTOR OPERATORS	REFER TO SPECIFICATIONS PARAGRAPH	KIND OF COPIES	COPIES FOR APPROVAL TO (A) BEFORE FABRICATION	CERTIFIED COPIES	
				TO (A)	TO (B)
1 Certified Test Reports for	G-11.8.3	REPRODUCIBLE PRINTS			
2 Compliance to NEMA STD MG-1 as		REPRODUCIBLE PRINTS			
3 follows:		REPRODUCIBLE PRINTS			
4 a) MG1-12.42 Temperature Rise-a.c.		REPRODUCIBLE PRINTS	1		
5 b) MG1-12.63 Temperature Rise-d.c.		REPRODUCIBLE PRINTS	1		
6 c) MG1-12.02, 12.03 High Potential		REPRODUCIBLE PRINTS	1		
7 Tests		REPRODUCIBLE PRINTS			
8		REPRODUCIBLE PRINTS			1
9 Certified Test reports as follows:	G-11.8.4	REPRODUCIBLE PRINTS			
10 Valve operating performance at		REPRODUCIBLE PRINTS			1
11 a) 80% rated voltage		REPRODUCIBLE PRINTS			1
12 Seat leakage test for Torque		REPRODUCIBLE PRINTS			1
13 b) Seated Valves only.		REPRODUCIBLE PRINTS			1
14 Operational Test for opening		REPRODUCIBLE PRINTS			1
15 c) against maximum differential pressure.		REPRODUCIBLE PRINTS			1
16 Motor Data Sheets, Form 182	G-11.11	REPRODUCIBLE PRINTS	1		
17 Motor Temperature Rise vs.		REPRODUCIBLE PRINTS			
18 Time Curve	G-11.8.36	REPRODUCIBLE PRINTS	1		
19					
20					

 S.F. POWER DIVISION	PHILADELPHIA ELECTRIC COMPANY LIMERICK GENERATING STATION UNITS 1 & 2 QUALITY ASSURANCE DOCUMENTATION DISTRIBUTION REQUIREMENTS	Job No. 8031 DESIGN SPECIFICATION 8031-P-104 APPENDIX 5 SHEET A5-3	REV. 5
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FOR QUALITY ASSURANCE USE


(A) Mr. W.C. McDaniel
 Project Engineer
 Bechtel Power Corporation
 P.O. Box 3965
 San Francisco, Calif. 94119

(B) Bechtel Power Corporation
 Limerick Generating Station
 P.O. Box A, Sanatoga Branch
 Pottstown, PA. 19464
 Attention: T.M. Gwin Project
 Construction Manager

The required certified copies shall be furnished prior to shipment of material.

5 REVISED AS MARKED
 3 Revised as Marked
 2 ASSIGNED FOR CO'S. CHECK
 ENJ
 MA
 JUPV
 AP-PROV-ALS
 DATE

CLASS I (IEEE) MOTOR OPERATORS	DATA REQUIREMENTS	REFER TO SPECIFICATIONS PARAGRAPH	KIND OF COPIES	COPIES FOR APPROVAL TO (A) BE: FORE FABRICATION	CERTIFIED COPIES	
					TO (A)	TO (B)
1	d) Electrical Data during operation test (c) above and during a closing cycle as follows:	G-11.8.4	REPRODUCIBLE PRINTS			
2	1) Test instrument identification		REPRODUCIBLE PRINTS			1
3	2) Test voltage & Frequency		REPRODUCIBLE PRINTS			1
4	3) valve operation		REPRODUCIBLE PRINTS			1
5	Motor current drawn during		REPRODUCIBLE PRINTS			
6	4) of torque switches		REPRODUCIBLE PRINTS			1
7	Settings of torque & position		REPRODUCIBLE PRINTS			1
8	5) switches		REPRODUCIBLE PRINTS			1
9	6) Motor insulation test	G-11.8.3	REPRODUCIBLE PRINTS			1
10	Qualification test procedure, including Seismic	G-11.8.2 & G-11.4	REPRODUCIBLE PRINTS	1	1	
11	Qualification test results	G-11.8.2	REPRODUCIBLE PRINTS		1	1
12	Design Interface Procedure	G-11.10	REPRODUCIBLE PRINTS	1		
13	Valve Motor Operator Compatibility Form	G-11.8.3a	REPRODUCIBLE PRINTS	1		1
14	Tabulation of motor no-load, full-load, and locked rotor currents	G-11.8.3c	REPRODUCIBLE PRINTS	1		
15			REPRODUCIBLE PRINTS			
16			REPRODUCIBLE PRINTS			
17			REPRODUCIBLE PRINTS			
18			REPRODUCIBLE PRINTS			
19			REPRODUCIBLE PRINTS			
20			REPRODUCIBLE PRINTS			

FORM 8031-0A.  S.F. POWER DIVISION	PHILADELPHIA ELECTRIC COMPANY LIMERICK GENERATING STATION UNITS 1 & 2 QUALITY ASSURANCE DOCUMENTATION DISTRIBUTION REQUIREMENTS	Job No. 8031 DESIGN SPECIFICATION 8031-P-104 APPENDIX 5 SHEET A5-4	REV. 5
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FOR QUALITY ASSURANCE USE

(A) *W.C. McDaniel*
 Project Engineer
 Bechtel Power Corporation
 P.O. Box 3965
 San Francisco, Calif. 94119

(B) Bechtel Power Corporation
 Limerick Generating Station
 P.O. Box A, Sanatoga Branch
 Pottstown, PA. 19464
 Attention: *T.M. Gwalt* Project
 Construction Manager

The required certified copies shall be furnished prior to shipment of material.

1675
 APPROVALS
 MATL.
 SUPV.
 CHK.
 DR.
 ENG.
 5 REVISED AS MARKED
 3 Revised as Marked
 2 ISSUED FOR CONSTRUCTION
 REV. DESCRIPTION

NO.	DATA REQUIREMENTS	REFER TO SPECIFICATIONS PARAGRAPH	KIND OF COPIES	COPIES FOR APPROVAL TO (A) BEFORE FABRICATION	CERTIFIED COPIES	
					TO (A)	TO (B)
NON-CLASS I (IEEE) MOTOR OPERATORS						
1	Electrical Data during valve operational test as follows:	G-11.8.5	REPRODUCIBLE PRINTS			
2	1) Test voltage and frequency		REPRODUCIBLE PRINTS			1
3	2) Motor current drawn during valve operation		REPRODUCIBLE PRINTS			1
4	3) Motor current drawn at opening of torque switches		REPRODUCIBLE PRINTS			1
5	4) Settings of torque and position switches		REPRODUCIBLE PRINTS			1
6	Design Interface Procedure	G-11.10	REPRODUCIBLE PRINTS	1 1		
7	Motor Insulation Test	G-11.8.5b	REPRODUCIBLE PRINTS			1
8	Valve Motor Operator Compatibility Form	G-11.8.3a	REPRODUCIBLE PRINTS	1		1
9	Certified Test Reports for Compliance to NEMA STD MG-1	G-11.8.5b	REPRODUCIBLE PRINTS			
10	a) MGI-12.42 Temperature Rise-a.c. Motors		REPRODUCIBLE PRINTS	1		
11	b) MGI-12.61 Temperature Rise-d.c. Motors		REPRODUCIBLE PRINTS	1		
12	c) MGI-12.02 Hi Potential Test		REPRODUCIBLE PRINTS	1		
13	Tabulation of Motor no load, full load, and locked rotor currents	G-11.8.5c	REPRODUCIBLE PRINTS	1		
14	Motor Data Sheets, Form 182	G-11.11	REPRODUCIBLE PRINTS	1		
15	Motor Temperature Rise vs. Time Curve	G-11.8.5d	PRINTS	1		
16						
17						
18						
19						
20						



PHILADELPHIA ELECTRIC COMPANY
 LIMERICK GENERATING STATION UNITS 1 & 2

QUALITY ASSURANCE
 DOCUMENTATION DISTRIBUTION
 REQUIREMENTS

Job No. 8031
 DESIGN SPECIFICATION
 8031-P-104
 APPENDIX 5
 SHEET A5-1

REV.
 5

FORM 8031-QA

FOR QUALITY ASSURANCE USE

(A) Mr. W.C. McDaniel
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 Bechtel Power Corporation
 P.O. Box 3965
 San Francisco, Calif. 94119

(B) Bechtel Power Corporation
 Limerick Generating Station
 P.O. Box A, Sanatoga Branch
 Pottstown, PA. 19464
 Attention: T.M. GWIN
 Construction Manager

The required certified copies shall be furnished prior to shipment of material.

REV. DESCRIPTION	DATE	APPROVALS	MATERIAL	SUPERVISOR	DRAWING	ENGINEER	DATA REQUIREMENTS	REFER TO SPECIFICATIONS PARAGRAPH	KIND OF COPIES	COPIES FOR APPROVAL TO (A) BEFORE FABRICATION		CERTIFIED COPIES	
										TO (A)	TO (B)	TO (A)	TO (B)
1							DATA REQ'S FOR THE FUNCTIONALLY RELATE NON-PRESSURE RETAINING VALVE PARTS FOR THE QUALITY ASSURED ITEMS ON ADV'S P.O. 8031-P-KACC	*	REPRODUCIBLE PRINTS				
2									REPRODUCIBLE PRINTS				
3									REPRODUCIBLE PRINTS				
4							CERTIFIED MILL TEST REPORTS FOR THE GATE & GLOBE VALVE STEMS, YOKES AND FOR THE CHECK VALVE HANGERS.	15.1.a	REPRODUCIBLE PRINTS				1
5									REPRODUCIBLE PRINTS				
6									REPRODUCIBLE PRINTS				
7							Value Operability Test Procedure	see M/R special note 20	REPRODUCIBLE PRINTS	1		1	
8							Value Operability Test Data		REPRODUCIBLE PRINTS	1		1	
9									REPRODUCIBLE PRINTS				
10									REPRODUCIBLE PRINTS				
11									REPRODUCIBLE PRINTS				
12									REPRODUCIBLE PRINTS				
13									REPRODUCIBLE PRINTS				
14									REPRODUCIBLE PRINTS				
15									REPRODUCIBLE PRINTS				
16									REPRODUCIBLE PRINTS				
17									REPRODUCIBLE PRINTS				
18									REPRODUCIBLE PRINTS				
19									REPRODUCIBLE PRINTS				
20									REPRODUCIBLE PRINTS				
*SPECIAL NOTE IS ON PG 36 OF M/R 8031-P-104													

8 Revised for use
6 ISSUED FOR USE

FORM 8031-QA



S.F.
POWER
DIVISION

PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION UNITS 1 & 2

QUALITY ASSURANCE
DOCUMENTATION DISTRIBUTION
REQUIREMENTS

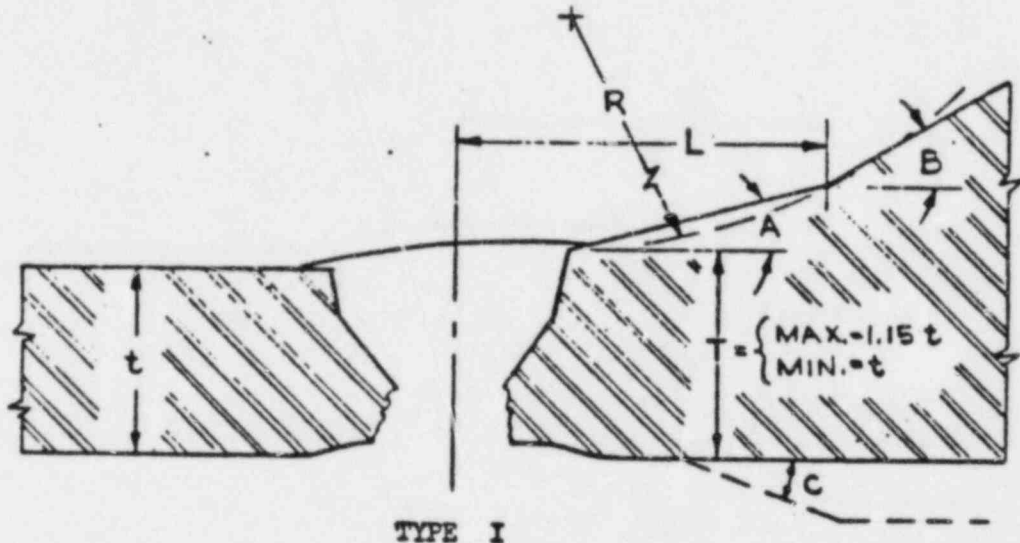
Job No. 8031

DESIGN
SPECIFICATION
8031-P-104
APPENDIX 5
SHEET A5-6

REV.

8


7-4-72	5/26/72	7/11/72	DATE
8/23/72	8/23/72	8/23/72	APPROVALS
8/23/72	8/23/72	8/23/72	MATL
8/23/72	8/23/72	8/23/72	SUPV
8/23/72	8/23/72	8/23/72	CHK
8/23/72	8/23/72	8/23/72	DR
8/23/72	8/23/72	8/23/72	ENG
REV. DESCRIPTION			
2	REVISED AS INDICATED		
1	ISSUED FOR CONSTRUCTION		
1	REVISED AS INDICATED		



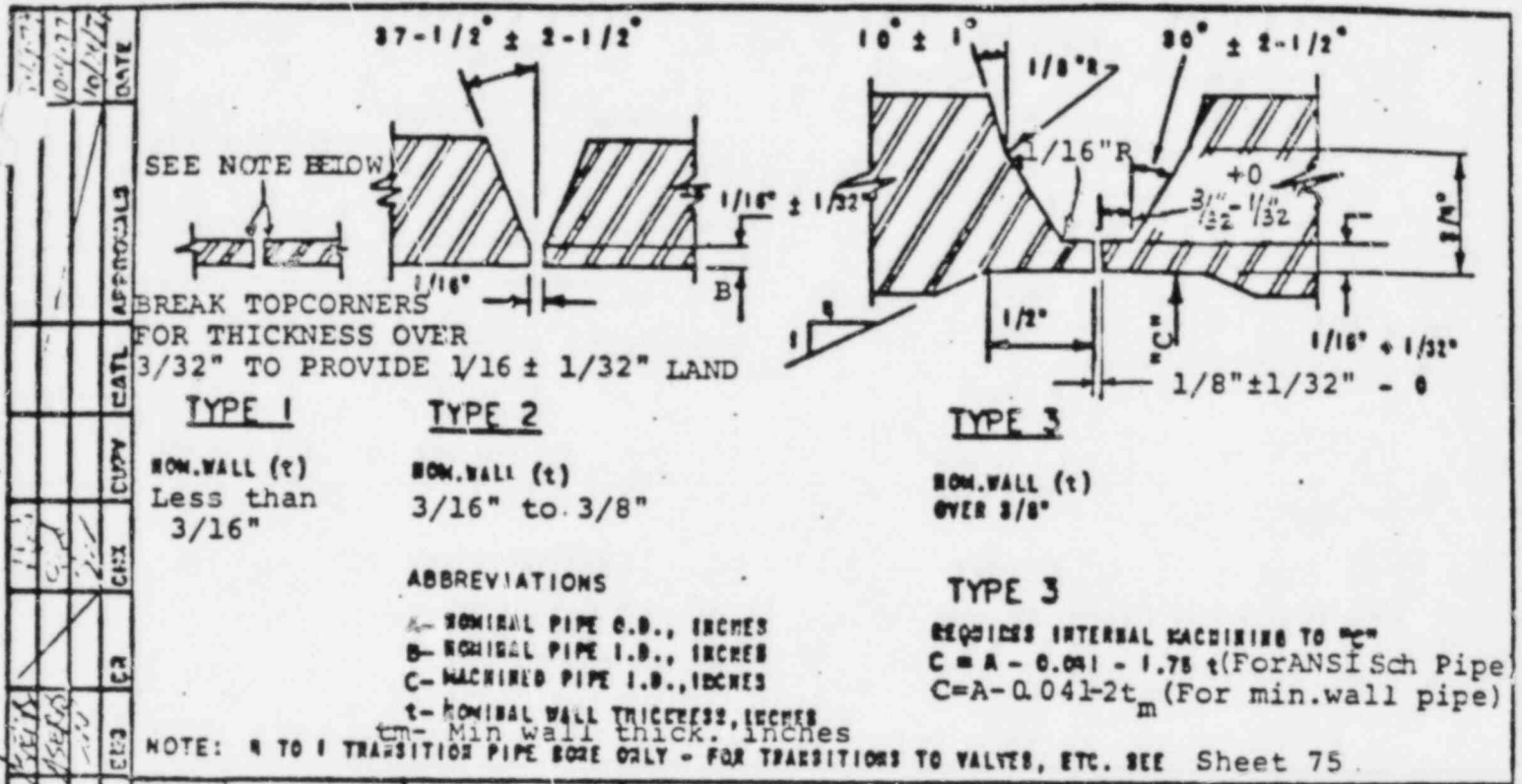
TYPE I

Type	t=Nom. Pipe Wall	L	R	Maximum Angle (Deg.)		
				A	B	C
I	Less than 3/4"	2 1/2 t	2 1/2"	15°	30°	10°
I	3/4" to 1" Incl.	2t	3"	15°	30°	10°
I	More than 1"	1 1/2 t	3"	15°	30°	10°
II	Machine to ANSI B16.5 - Fig.9 & Table 11 (See Note #4)					

1. For Nuclear Class 1 piping material, valves and equipment of 600#, 900# and 1500# primary valve and flange rating use type I
2. Type II Transitions for all other classes and primary valve/flange
3. The internal transition angle "C" shall not exceed 10° for Type I, or 30° for Type II.
4. Manufacturer's transition of radius "R" is an acceptable alternate.
5. Inside contours of all type I transition shall be in accordance with Fig. 9 or Fig. 11, as applicable, of ANSI B16.5, 1968.
6. Weld end transitions per ASME Section III-1977 Fig. NX 4250-1 are acceptable for all flange ratings and classes except those for Nuclear Class 1 shall be Type I above.

A-405-P 9-11-63  POWER AND INDUSTRIAL DIVISION	WELD END TRANSITIONS FOR VALVES, FITTINGS AND EQUIPMENT	JOB No 8031	REV.
	LIMERICK GENERATING STATION UNITS 1 AND 2 PHILADELPHIA ELECTRIC COMPANY	8031-P-300 APPENDIX B SHEET 75 OF 82	16

DESIGN SPECIFICATION 8031-P-104



PIPE CLASS	"A" NOMINAL O.D.	SCHEDULE	"t" NOMINAL WALL THICKNESS	"B" NOMINAL I. D. TYPE 1 & 2	"C" MACHINED I. D. TYPE 3 ± .018	REMARKS
	24.000	80	1.219	--	21.828	
	20.00		1.031	--	18.155	
	18.00		.938	--	16.318	
	16.00		.844	--	14.482	
	14.000		.750	--	12.647	
	12.750		.687	--	11.505	
	10.750		.594	--	9.670	
	8.625		.500	--	7.709	
	6.625		.432	--	5.828	
	4.500		.337	3.826	--	
	3.500		.438	--	2.693	
	2.875		.375	2.125	--	
	4.500		.531	--	3.530	
	10.750	80S	.500	--	9.834	
	30.000	20	.500	--	29.084	

11-078 A
0-4-63

POWER AND INDUSTRIAL DIVISION

WELD END PREPARATION

TUNGSTEN-INERT-GAS SHIELDED-ARC WITHOUT CONSUMABLE INSERT RINGS

LIMERICK GENERATING STATION

UNITS 1 & 2

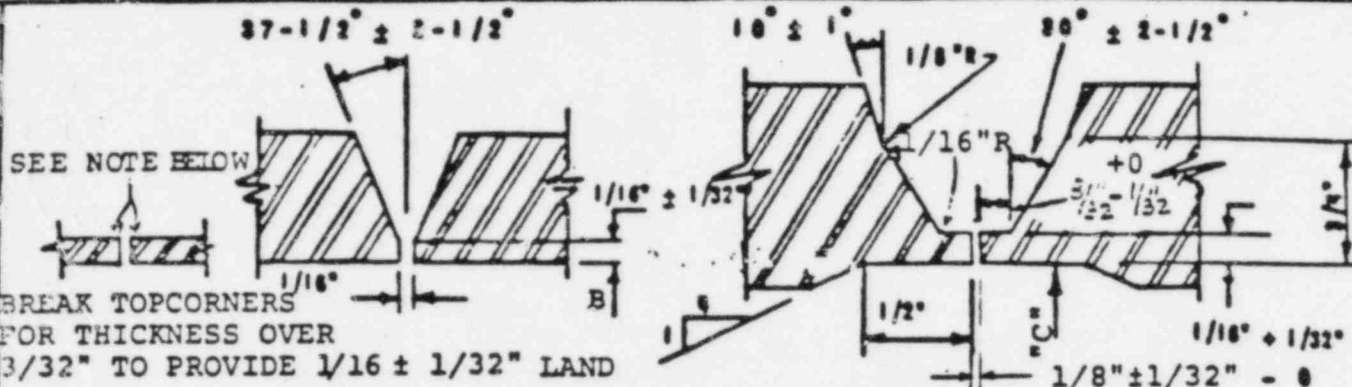
PHILADELPHIA ELECTRIC COMPANY

8031-P-300

APPENDIX 9

SHEET 72.1 OF 53

DESIGN SPECIFICATION 8031-P-104



TYPE 1
 NOM. WALL (t)
 Less than 3/16"

TYPE 2
 NOM. WALL (t)
 3/16" to 3/8"

TYPE 3
 NOM. WALL (t)
 OVER 3/8"

ABBREVIATIONS

- A- NOMINAL PIPE O.D., INCHES
- B- NOMINAL PIPE I.D., INCHES
- C- MACHINED PIPE I.D., INCHES
- t- NOMINAL WALL THICKNESS, INCHES
- t_m- Min wall thick. inches

TYPE 3
 REQUIRES INTERNAL MACHINING TO t_m
 $C = A - 0.041 - 1.75 t$ (For ANSI Sch Pipe)
 $C = A - 0.041 - 2t_m$ (For min. wall pipe)

NOTE: 4 TO 1 TRANSITION PIPE SOLE ONLY - FOR TRANSITIONS TO VALVES, ETC. SEE Sheet 75

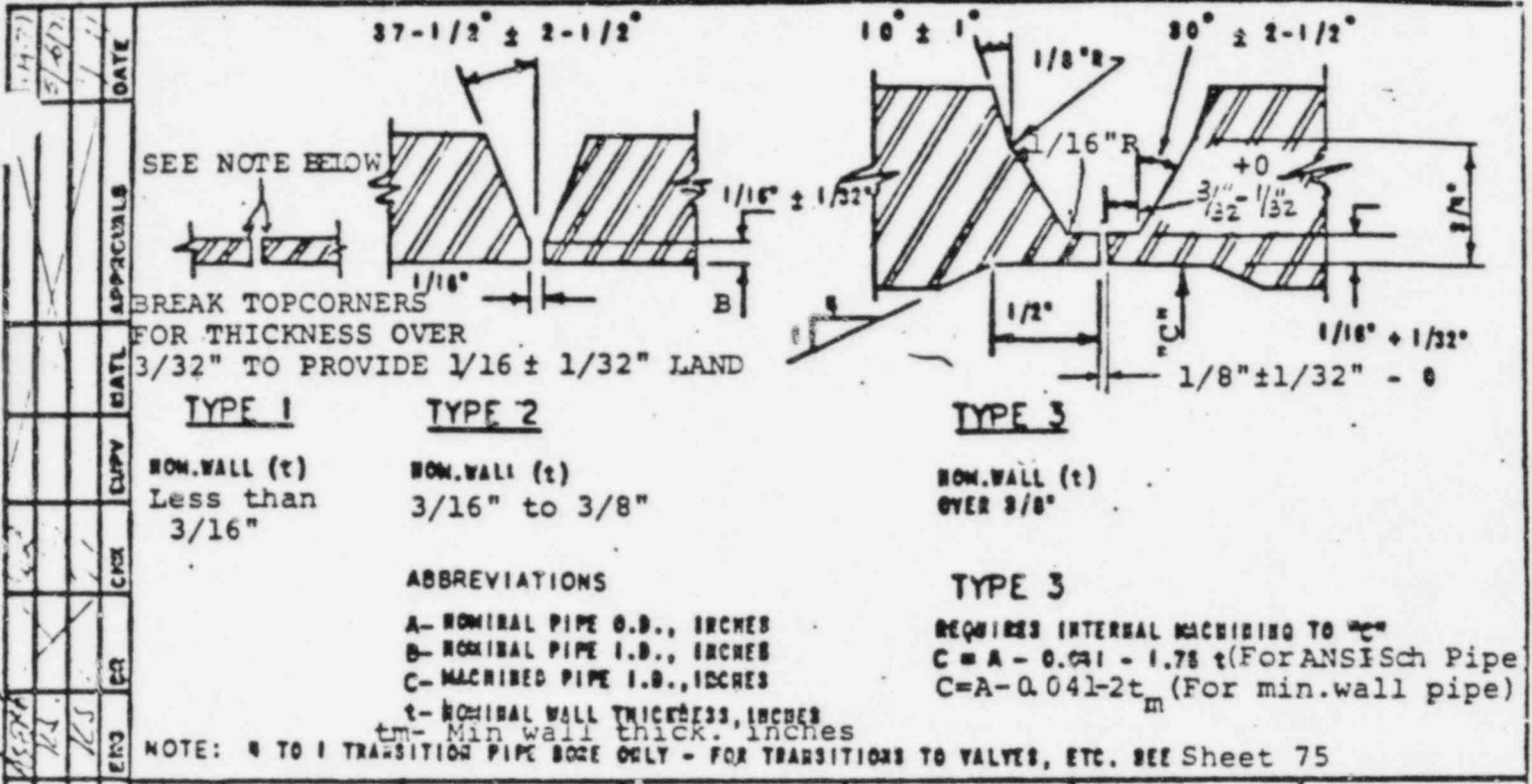
PIPE CLASS	"A" NOMINAL O.D.	SCHEDULE	"t" NOMINAL WALL THICKNESS	"B" NOMINAL I. D. TYPE 1 & 2	"C" MACHINED I. D. TYPE 3 ± .010	REMARKS
	36"	Std	.375	35.250	--	
	30"		.375	29.250	--	
	28"		.375	27.250	--	
	26"		.375	25.250	--	
	24.000		.375	23.250	--	
	20.000	40 & 40S	.375	19.250	--	
	18.000		.375	17.250	--	
	16.000		.375	15.250	--	
	14.000		.375	13.250	--	
	12.750		.375	12.000	--	
	10.750		.365	10.020	--	
	8.625		.322	7.981	--	
	6.625		.280	6.065	--	
	4.500		.237	4.026	--	
	3.500		80 & 80S	.300	2.900	--
	2.875	.276	2.323	--		
	3.500	40 & 40S	.216	3.068	--	
	2.875	.203	2.469	--		
	8.625	.375	7.875	--		

ISSUED FOR CONSTRUCTION
 REVISED AS AMENDED
 REV. DESCRIPTION



WELD END PREPARATION
 TUNGSTEN-INERT-GAS SHIELDED-ARC
 WITHOUT CONSUMABLE INSERT RINGS
 LIMERICK GENERATING STATION
 UNITS 1 & 2
 BETHLEHEM ELECTRIC COMPANY

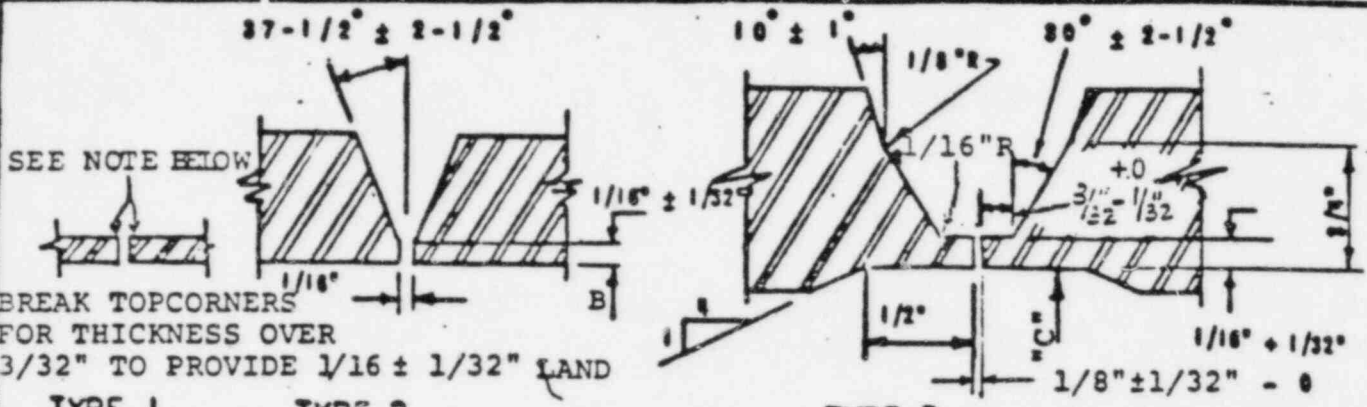
8031
 8031-P-300
 APPENDIX 9
 SHEET 72.2 OF 95



PIPE CLASS	A NOMINAL O.D.	SCHEDULE	t NOMINAL WALL THICKNESS	B NOMINAL I. D. TYPE 1 & 2	C MACHINED I. D. TYPE 3 ± .010 ± .008	REMARKS
	24.000	10	.688	--	22.757	
	20.000		.594	--	18.922	
	18.000		.562	--	16.976	
	16.000		.500	--	15.084	
	14.000		.438	--	13.192	
	12.750		.406	--	11.999	
	14.000	10	.250	13.500	-	
	16.000		.250	15.500	-	

14 REVISED AS INDICATED
 ISSUED FOR CONSTRUCTION
 ISSUED FOR BIDS
 REV. DESCRIPTION

DESIGN SPECIFICATION 8031-P-104



SEE NOTE BELOW
 BREAK TOP CORNERS FOR THICKNESS OVER 3/32" TO PROVIDE 1/16 ± 1/32" LAND

TYPE 1

NOM. WALL (t)
 Less than 3/16"

TYPE 2

NOM. WALL (t)
 3/16" to 3/8"

TYPE 3

NOM. WALL (t)
 OVER 3/8"

ABBREVIATIONS

- A- NOMINAL PIPE O.D., INCHES
- B- NOMINAL PIPE I.D., INCHES
- C- MACHINED PIPE I.D., INCHES
- t- NOMINAL WALL THICKNESS, INCHES
- t_m- Min wall thick., inches

TYPE 3

REQUIRES INTERNAL MACHINING TO "c"
 C = A - 0.041 - 1.75 t (For ANSI Sch Pipe)
 C = A - 0.041 - 2t_m (For min. wall pipe)

NOTE: 4 TO 1 TRANSITION PIPE EDGE ONLY - FOR TRANSITIONS TO VALVES, ETC. SEE Sheet 75

PIPE CLASS	"A" NOMINAL O.D.	SCHEDULE	"t" NOMINAL WALL THICKNESS	"B" NOMINAL I.D. TYPE 1 & 2	"C" MACHINED I.D. TYPE 3 ± .015	REMARKS
	24.000	120 ↓	1.812	--	20.788	
	20.000		1.500	--	17.334	
	18.000		1.375	--	15.553	
	16.000		1.219	--	13.825	
	14.000		1.094	--	12.046	
	12.750		1.000	--	10.959	
	10.750		.844	--	9.234	
	8.625		.719	--	7.327	
	6.625		.562	--	5.600	
	4.500		.438	--	3.693	

3 REVISED AS INDICATED
 4 REVISED AS INDICATED
 12 REVISED AS INDICATED
 REV. DESCRIPTION

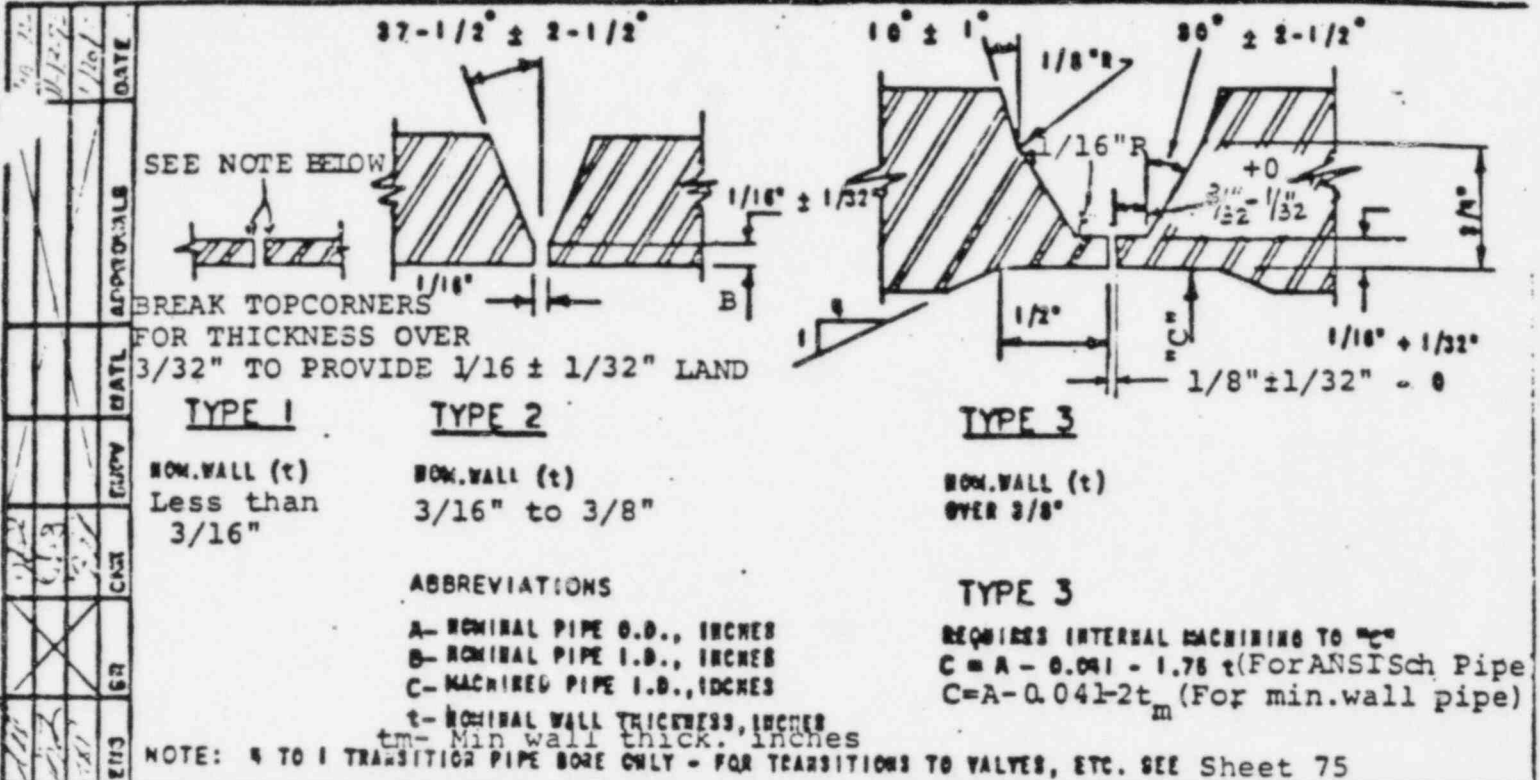


WELD END PREPARATION
 TUNGSTEN-INERT-GAS SHIELDED-ARC
 WITHOUT CONSUMABLE INSERT RIDGES
 LIMERICK GENERATING STATION
 UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

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 8031-P-300
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M-173
 0-4-3

REV.
 12



PIPE CLASS	" A " NOMINAL O.D.	SCHEDULE	" t " NOMINAL WALL THICKNESS	" B " NOMINAL I. D. TYPE 1 & 2	" C " MACHINED I. D. TYPE 3 ± .018	REMARKS
	24.000	XS ↓ 10S ↓ XS	.500	--	23.084	
	20.000		.500	--	19.084	
	18.000		.500	--	17.084	
	24.000		.250	23.500		
	20.000		.219	19.564		
	18.000		.188	17.624		
	16.000		.188	15.624		
	14.000		.188	13.624		
	12.750		.180	12.390		
	10.750		.165	10.420		
	8.625		.148	8.329		
	6.625		.134	6.357		
	4.500		.120	4.260		
	3.500		.120	3.260		
	2.875		.120	2.635		
	16.000		.500	--	15.084	
	14.000		.500	--	13.084	

3 REVISED AS INDICATED
 7 REVISED AS INDICATED
 8 REVISED AS INDICATED
 REV. DESCRIPTION

M-978 A - 0-0-0

PETER AND INDUSTRIAL DIVISION

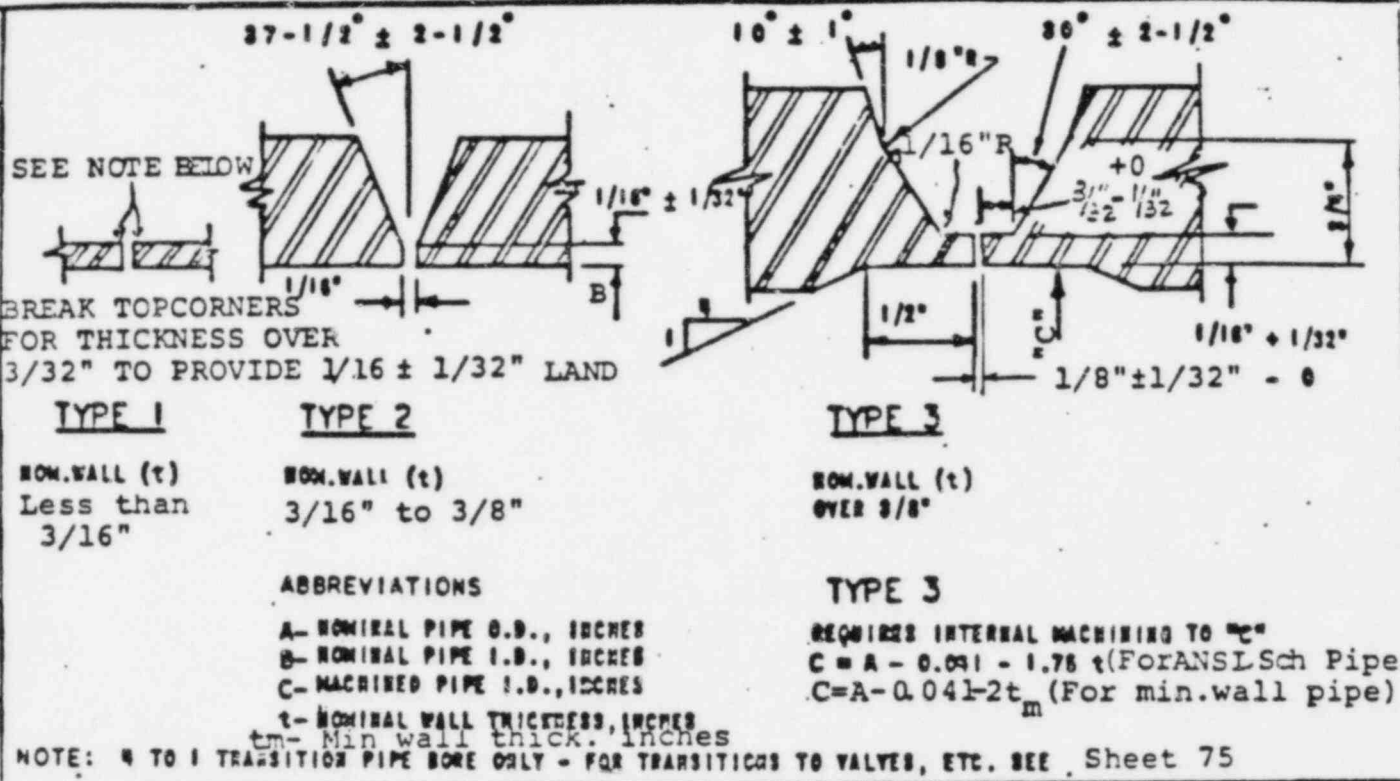
WELD END PREPARATION

TUNGSTEN-INERT-GAS SHIELDED-ARC
 WITHOUT CONSUMABLE INSERT RINGS
 LIMERICK GENERATING STATION
 UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

8031-P-300
 APPENDIX 9
 SHEET 72.5 OF 85

REV. 7

104-77	1/1/47	1/25/47	DATE
			APPROVALS
			MATL
			SUPPLY
			CHK
			DR
			ENR



PIPE CLASS	"A" NOMINAL O.D.	SCHEDULE	"t" NOMINAL WALL THICKNESS	"B" NOMINAL I. D. TYPE 1 & 2	"C" MACHINED I. D. TYPE 3 ± .018	REMARKS
	24.000	100	1.531	--	21.280	
	20.000		1.281	--	17.718	
	18.000		1.156	--	15.936	
	16.000		1.031	--	14.155	
	14.000		.938	--	12.318	
	12.750		.844	--	11.234	
	10.750		.719	--	9.453	
	8.625		.594	--	7.547	
	6.625	120	.562	--	5.601	

10 REVISIONS AS SHOWN
1A REVISION AS INDICATED
REVISED BY: WJCA, D

POWER AND INDUSTRIAL DIVISION

WELD END PREPARATION

TUNGSTEN-INERT-GAS SHIELDED-ARC WITHOUT CONSUMABLE INSERT RINGS

LIMERICK GENERATING STATION

UNITS 1 & 2

PHILADELPHIA ELECTRIC COMPANY

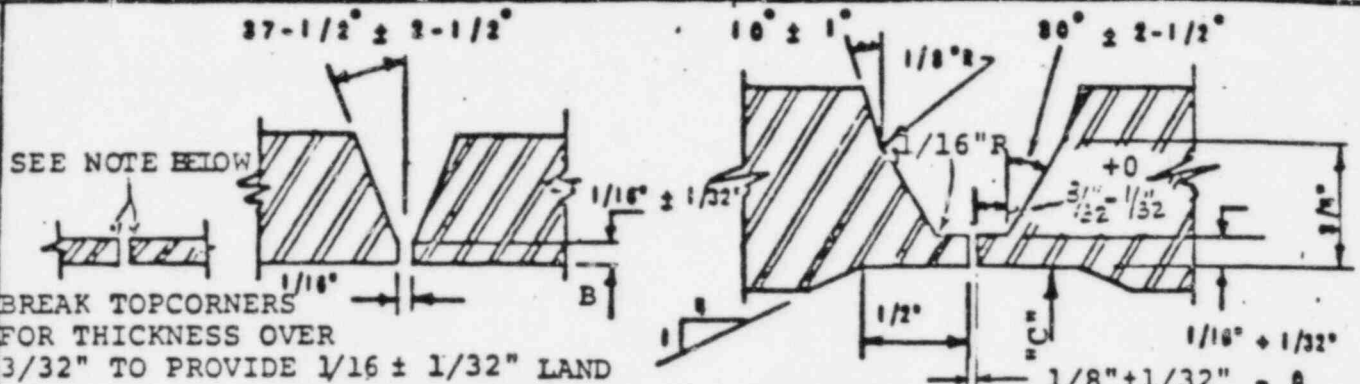
8031

8031-P-300

APPENDIX 9

SHEET 72.6 OF 83

DESIGN SPECIFICATION 8031-P-104



TYPE 1
 NOM. WALL (t)
 Less than 3/16"

TYPE 2
 NOM. WALL (t)
 3/16" to 3/8"

TYPE 3
 NOM. WALL (t)
 OVER 3/8"

ABBREVIATIONS
 A- NOMINAL PIPE O.D., INCHES
 B- NOMINAL PIPE I.D., INCHES
 C- MACHINED PIPE I.D., INCHES
 t- NOMINAL WALL THICKNESS, INCHES
 t_m- Min. wall thick. inches

TYPE 3
 REQUIRES INTERNAL MACHINING TO t_m
 C = A - 0.041 - 1.73 t (For ANSI Sch Pipe)
 C = A - 0.041 - 2t_m (For min. wall pipe)

NOTE: 4 TO 1 TRANSITION PIPE SIZE ONLY - FOR TRANSITIONS TO VALVES, ETC. SEE Sheet 75

PIPE CLASS	"A" NOMINAL O.D.	SCHEDULE	"t _m " WALL THICKNESS	"B" NOMINAL I. D. TYPE 1 & 2	"C" MACHINED I. D. TYPE 3 ± .010	REMARKS
DCA	20.000		.903	-	18.153	
DCA	24.000		1.100	-	21.759	
DCA	20.000		.735	-	18.489	
	DELETED			-		
	DELETED			-		
EBB	26.000		.928	-	24.103	
	DELETED			-		
GBD	30.000		.630	-	28.699	
GCC	16.000		.194	15.571	-	
	DELETED					
	18.000		.171"	17.617	-	
Ebc	26.000		.578"		24.803	
DBD	34.000		1.740		30.479	

11 REVISED AS INDICATED
 10 REVISED AS INDICATED
 14 REVISED AS INDICATED

M-978 A - 0-0-03



WELD END PREPARATION
 TUNGSTEN-INERT GAS SHIELDED-ARC
 WITHOUT CONSUMABLE INSERT RINGS
 LIMERICK GENERATING STATION
 UNITS 1 & 2
 PHILADELPHIA ELECTRIC COMPANY

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 8031-P-300
 APPENDIX 9
 SHEET 72.7 OF 53

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Rev. 4/68

FORM 79

Page 1 of 6

FABRICATORS WELDING PROCEDURE
SPECIFICATION AND QUALIFICATION RECORD

NAME OF FABRICATOR: _____

LOCATION: _____

On work performed under the ASME or USA Standard Codes, the welding procedure to be used on fabrication and the qualification of this procedure in conformance with the applicable Code is required to be recorded. The information to be furnished is required by Section IX of the ASME Boiler and Pressure Vessel Code, Chapter V of the USA Standard Code for Pressure Piping; B31.1.0 and B31.3; and Section 7 of API 650. The Welding-Procedure Specification and the Qualification Records shall be recorded in the recommended forms outlined below as Part I and Part II, or in an equivalent form which covers all of the information required below.

Referenced to Paragraphs and Tables refer to those in Section IX of the ASME Boiler and Pressure Vessel Code. Similar requirements for procedure qualifications under the USAS Code are contained in Paragraph 127.5 of USAS B31.1.0 and Paragraph 327.5 of USAS B31.3.

PART I

WELDING-PROCEDURE SPECIFICATION

Applying to Ferrous and Nonferrous Materials and All Welding Processes.

PROCEDURE SPECIFICATION FOR _____ WELDING.

(Shielded metal-arc, automatic submerged-arc, gas tungsten-arc, gas metal-arc, combination, etc.)

FABRICATORS PROCEDURE DESIGNATION: _____ DATE _____ REVISION _____

A change in any of the essential variables which are described in the succeeding paragraphs will require a new Procedure Specification (see Paragraphs Q-11 and QN-11)

(continued on Page Two)

For Bechtel Use Only - Do Not Fill In

		COMMENTS
(1)	APPROVED	
(1A)	APPROVED FOR FABRICATION AS MARKED REVISED DRAWING NOT REQUIRED	
(2)	APPROVED AS MARKED REVISED DRAWING REQUIRED	
(3)	NOT APPROVED, REVISED DRAWING REQUIRED.	

This approval of general compliance with our requirements does not relieve Supplier of responsibility to furnish material or equipment meeting all service and dimensional conditions stipulated or implied by the purchase order.

BECHTEL CORPORATION

Date _____ By _____

V.P. _____

EQUIP. NO. _____

APPENDIX IO TO
DESIGN SPECIFICATION 8031-P-104

FORM 79, Rev. 4/68
Page 2 of 6

FABRICATORS PROCEDURE DESIGNATION: _____

1. BASE METAL. The base metal shall conform to the specifications for _____

(Insert here references to ASME, ASTM or other Code or Standard designations or attach complete information on chemical analysis and mechanical properties) which is found in materials Group P-Number _____ (See Tables Q-11.1 and QN-11.1)

2. FILLER METAL. The filler metal shall conform to ASME Filler Metal Specification Number _____ for _____ filler metal
(A233, A316, A559, etc.) (ferrous, non-ferrous - state which)
in Group Number F- _____ AWS-ASTM Classification
(See Tables Q-11.2 and QN-11.2)

Number _____
(E6010, E8016-B2, EM12K, E60S-2, etc.)

FOR FERROUS FILLER METAL INCLUDE THE FOLLOWING DATA:

The chemical composition of the weld deposit shall fall within the limits of weld metal analysis No. A- _____ (See Table Q-11.3), or shall be within the following composition limits: _____

For oxyacetylene welding, the filler metal shall be _____
_____ killed steel. (silicon, aluminum -
state which)

3. FLUX FOR SUBMERGED ARC WELDING. The flux shall conform to ASTM A558.
Type _____ - _____ or to the following nominal composition _____

(Insert here chemical composition range or trade designation)

4. GAS FOR INERT-GAS ARC WELDING. The shielding gas shall conform to the following nominal composition _____
(Insert here the single gas, the proportional parts of flow rates of mixed gases, or the trade designation of the gas used)

5. POSITION: The welding shall be done in the _____ Position.
(Give position or positions in which the welding will be done. See paragraphs Q-3, QN-3, Q-4 and QN-4)

6. PREHEAT. _____

(This paragraph should describe any preheating and control of temperature during welding that will be done.)

7. HEAT TREATMENT. _____

(This paragraph should describe any heat treatment or stress-relieving that is given the welded parts before or after welding. State rate of heating, holding time at temperature, and rate of cooling.)

8. BACKING STRIP. The welded joints _____ utilize a backing strip.
(shall, shall not - state which)

9. WELDING PROCEDURE. Machine welded joints shall be made by _____

(Multiple passes, a single pass per side - state which)

Machine welded joints shall be made by _____ method.
(single arc, multiple arc, state which)

10. WELDING PROCESS. The welding process shall be done by _____
(name of process)

using a _____. Inert gas metal arc welding shall be done
(Machine or manual equipment - state which)

using a _____ electrode of _____
(consumable, nonconsumable - state which)

_____. (State ASTM Classification or material of
which electrode is made.)

11. BASE METAL THICKNESS. This procedure is proposed to allow welding of material
thickness between _____ inch and _____ inches. (See Tables Q-13 and QN-13)

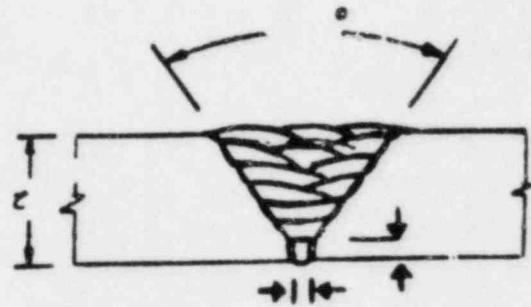
NON-ESSENTIAL VARIABLES

The following paragraphs describe details which are not essential variables.
Changes in these details may be made without setting up a new Procedure Spec-
ification provided they are recorded as revisions.

12. PREPARATION OF BASE MATERIAL. The edges of surfaces of the parts to be joined
by welding shall be prepared by _____
(State whether sheared, machined, ground,
gas-cut, etc.)

13. ELECTRICAL CHARACTERISTICS. The current used shall be _____
(State whether direct or alternating; if alternating, give frequency)
The base material shall be on the _____ side of the
(Negative "reverse polarity" or positive "straight polarity" when direct current
is used.)

14. JOINT WELDING PROCEDURE. The welding technique, such as electrode sizes, and
mean voltages and currents for each electrode, size of the welding tip and filler
rods, shall be substantially as shown on sketches below or attached. (The
sketches should show, for a minimum thickness and for several intermediate thick-
nesses of base material, the welding technique to be used whether weaving or
beading, the number of layers or passes and diameter of electrode with the mean
voltage and current for each layer or pass, and in case of vertical welds, the
progression of each pass, whether upward or downward.)



Show typical weld bevel details and sequence of weld layers above - see example at right.

Pass	Position	Electrode Classification	Diameter	Amps	Volts	Travel Speed

15. APPEARANCE OF WELDING LAYERS. The welding current and manner and of depositing the weld metal shall be such that there shall be practically no undercutting on the side wall of the welding groove or the adjoining base material.

16. CLEANING. All slag or flux remaining on any bead of welding shall be removed before laying down the next successive bead.

17. DEFECTS. Any cracks or blow holes that appear on the surface of any bead of welding shall be removed by chipping, grinding or gouging before depositing the next successive bead welding.

18. PEENING. _____

(If peening is to be used it shall be incorporated as part of the specification, and a description of the degree of peening to be done shall be stated in this paragraph)

19. TREATMENT OF UNDER SIDE OF WELDING GROOVE. _____

(The method of preparing the under or second side of a groove for welding on that side should be stated in this paragraph. If inert-gas purging is used, state gas composition and flow rate.)

Company Name _____

By _____

APPENDIX 10 TO DESIGN
SPEC. 8031-P-104

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PART II
WELDING-PROCEDURE QUALIFICATION RECORD

NAME OF FABRICATOR: _____
FABRICATOR'S PROCEDURE DESIGNATION _____ DATE _____ REV. _____
WELDING PROCESS _____
(Shielded metal-arc, automatic submerged-arc, gas tungsten-arc, combination, etc.)
BASE MATERIAL: Spec _____ P-Number _____
(ASME, ASTM, or USAS Spec. & Grade) (From Table Q-11.1 or QN-11.1)
Shape _____ Thickness _____
(Plate or Pipe, if Pipe, show dia.)
Thickness Range this test qualifies _____
ELECTRODE or FILLER MATERIAL:
AWS Class _____ ASTM Spec. _____
(E6010, E8016-B2, ER308, E60S-2, EM12, etc.) (A316, A558, A559, etc.)
F- Number _____ A-Number _____
(From Table Q-11.2 or QN-11.2) (From Table Q-11.3)
Describe filler metal if not included in Table Q-11.2 or QN-11.2
Filler Wire Manufacturer and Trade Name _____
Submerged-Arc Flux _____
(State ASTM Classification and Trade Name or Composition)
Shielding-Gas Composition _____ Flow Rate _____ Cu. Ft/Hr.
(Helium, Argon, or Combination)
Purge-Gas Composition _____ Cu. Ft/Hr.
(Helium, Argon, or Combination)
JOINT DESIGN: Bevel Angle _____ Single or Double _____
WELDING TECHNIQUE: Amps _____ Volts _____ Inches per Min. _____
Backing Strips Used _____ Position of Groove _____
(Yes or No) (Flat, horizontal, vertical, overhead)
HEAT TREATMENT: Preheat _____ Postheat _____ Interpass Temp. Range _____
(None or °F) (None or °F) (°F to °F)
Stress Relief _____ Holding _____ Time _____
(None or °F) (In hours)

FABRICATORS PROCEDURE DESIGNATION: _____

REDUCED-SECTION TENSILE TESTS

Position	Specimen Number	Dimensions		Area	Ultimate Total		Ultimate Unit-Stress	Location of Failure
		Width	Thickness		Loads	Lbs		

GUIDED-BEND TESTS

Position	Type	Specimen Number	Result	Position	Type	Specimen Number	Result

IMPACT TESTS
(Record When Required)

Specimen Type (Charpy - V, etc)	Size (Full, 1/2)	Position (1G, 2G, 5G)	Test Temperature	Weld Metal HAZ	Result (Foot Pounds)

WELDERS NAME _____ CLOCK NUMBER _____ STAMP NUMBER _____

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Date _____ Company Name _____
By _____

STATEMENT OF CONFORMANCE

We certify that the listed equipment and required documentation for same meet the requirements of the purchase order and applicable specifications:

P.O. NO.: _____ REV. _____

SPECIFICATION: _____ REV. _____

PRIME VENDOR: _____

SUPPLIER: _____

ADDRESS: _____

DESCRIPTION OF EQUIPMENT: _____

IDENTIFICATION: _____

a. ITEM NOS. _____

b. EQUIPMENT NOS. _____

c. TAG NOS. _____

APPROVED EXCEPTIONS: _____

Signature (Supplier Representative)

Title

Date

Distribution:

Original: Supplier to transmit to Jobsite

CC: Purchasers Inspector (2)

Supplier



Supplier Deviation Disposition Request

FOR SUPPLIER USE		NOTE: The reverse side of this form contains the instructions for its preparation and use. Items marked with an asterisk (*) are for Bechtel entries only.		FOR BECHTEL USE	
Supplier SDDR No.	Date Submitted			*Bechtel SDDR No.	*Date Received
1. Supplier Name _____ Address _____ City & State _____ Zip _____					
2. Supplier's Order No.	3. Supplier's Part No.	4. Supplier's Part Name	5. Date Deviation Determined	6. Previous SDDR (No. & Date)	
7. Buyer's P.O. No.	8. Buyer's Part No.	9. Buyer's Part Name	10. Bechtel Inspector Notified	11. Bechtel Eng. Notified	
12. Qty or Serial No.	13. Deviation Description (Attach extra sheets, photographs, sketches, etc. as necessary)				
14. Supplier's Disposition Classification: <input type="checkbox"/> Accept As Is <input type="checkbox"/> Repair <input type="checkbox"/> Modify Buyer's Requirement					
15. Proposed Disposition and Technical Justification:					
16. Associated Supplier Document Change (s):					
17. Suppliers Authorized Representative					
Signature: _____			Title: _____		
Name: _____			Date: _____		
*18. Bechtel Engrg. Action: Engrg. Follow-up: <input type="checkbox"/> Dwg Change <input type="checkbox"/> Other					
<input type="checkbox"/> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/> Rejected-Resubmit <input type="checkbox"/> Spec/Req. Change					
<input type="checkbox"/> Discipline or Suppliers Affected					
*19. Bechtel Disposition Statement Including Justification (Attach extra sheets, sketches, etc. as necessary)					
*20. Bechtel Engineering Approval		Date	Verification Signatures		Date
GS _____		_____	21. Supplier _____		_____
QE _____		_____	*22. Bechtel Insp. _____		_____
PE _____		_____			_____

APPENDIX 15

DYNAMIC QUALIFICATION AND FUNCTIONAL TESTING REQUIREMENTS

ASME III VALVES

1. DYNAMIC QUALIFICATION REQUIREMENTS

- A. All valves shall be demonstrated capable of withstanding the simultaneous application of the following loads:
- 1) All normal operating loads, including pressure and the weight of the valve topworks, i.e. everything above the body to bonnet joint.
 - 2) A horizontally applied inertial load equivalent to a seismic acceleration of [4.5g].
 - 3) A vertically applied inertial load equivalent to a seismic acceleration of [4.5g].
- B. The valve shall be assumed to be mounted in that orientation in which the loads in Paragraph 1A give rise to the highest stresses in the valve pressure boundary. The inertial loads shall be assumed to be applied at the center of mass of the valve topworks.
- C. Electric switches and all other mechanisms shall withstand the inertial loads noted in Paragraph 1.A without activating and changing the position of the valve.
- D. The topworks of the valve assembly shall be designed to have a fundamental frequency of vibration greater than 100 Hz whenever possible. However, in no case shall the first natural frequency be less than 33 cps. In either case, the first natural frequency shall be reported to the buyer. If this requirement cannot be obtained the Buyer shall be notified in the bid documents.
- E. Manual valves supplied without mechanical gearing may demonstrate compliance with the above requirements by the provision of calculations showing that the subject valve meets the requirements of Paragraph 1.D. All other valves shall demonstrate compliance with the above requirements by tests and/or analysis. For all valves 4 inches and larger and all valves supplied with mechanical gearing or power actuators, an analysis shall also be made to verify that the stresser in the valve pressure boundary are within the allowable stress limits specified in Article 3 of this appendix. Copies of the test data and/or the analyses shall be submitted and accepted by Bechtel prior to acceptance of the valves for shipment.

9

2. FUNCTIONAL TESTING REQUIREMENTS FOR POWER ACTUATED VALVES

A. All power actuated valves shall be tested at the manufacturer's plant to demonstrate that the operators provide the specified valve performance.

- 1) Motor operated valves shall be tested in accordance with Specification 8031-G-11 para. G-11.8.
- 2) Air operated valves shall have certified test reports submitted covering the following:
 - a) Demonstrating the valve performs its intended function with minimum air supply within the maximum time specified. Time for open/close and failure mode shall be recorded.
 - b) Seat leakage tests shall be performed with the valve seated and maintained by the operator alone.
 - c) Valve performance test noted in (a) above shall also simulate maximum operating differential pressure in accordance with the valve data sheets.

B. Active valves will be designated on the valve data sheets in the procurement documents.

Operability of active valves, during a postulated dynamic occurrence, shall be verified by testing. Test data acquired for a qualified valve may be used to qualify valves of the same type that fall within the range of sizes permitted by Table C-1, provided geometric similarity is maintained and supporting stress calculations are provided. If the qualified valve is larger than 36 inch nominal diameter, extrapolation may be made to valves whose nominal size does not vary more than 25 percent from that of the qualified valves. All testing required by this section is considered to be supplemental to any test/analysis used to qualify valves per para. 1 of this Appendix.

Table C-1
Valve Qualification Limits

---Size of Qualified Valve

Qualification extends to:

	1/2	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	22	24	26	28	30	36
1/2	X	X																		
1	X	X	X																	
1-1/2		X	X	X																
2			X	X	X															
3				X	X	X														
4					X	X	X													
6						X	X	X												
8							X	X	X	X										
10								X	X	X	X									
12								X	X	X	X	X								
14									X	X	X	X	X							
16										X	X	X	X	X						
18											X	X	X	X	X					
20											X	X	X	X	X	X	X			
22												X	X	X	X	X	X	X		
24													X	X	X	X	X	X		
26														X	X	X	X	X	X	
28														X	X	X	X	X	X	
30															X	X	X	X	X	
36																X	X	X	X	

C. Valves without topworks do not require functional testing.

- D. Except when an alternative testing procedure has been approved in accordance with Paragraph 2.E, valves with topworks shall be tested as follows:
- 1) The valve shall be placed in a suitable test stand. It shall be supported in a manner typical of actual installation, with the actuator and all other appurtenances mounted as in normal plant operation.
 - 2) The valve shall be internally pressured to the maximum operating pressure, as specified in the data sheets, Attachment [D] to the procurement documents. Concurrently a static load shall be applied in accordance with Paragraph 1.A of this appendix.
 - 3) The valve shall be actuated using the proposed valve actuator plant minimum actuation supply as defined in the data sheets.
 - a) The valve must cycle open and closed within its specified operating time limits as defined on the data sheets.
 - b) The valve stroke shall commence from the identical position (i.e. open or closed) as in the actual installation, and at least two full cycles shall be performed.
- E. If the Seller wishes to demonstrate the operability of valves with topworks by procedures different from those described in Subparagraph 2.D.3, he shall submit a detailed description of his proposed procedure for Bechtel's approval.
- F. After completion of the valve functional test, the seat leak test, as outlined in the hydrostatic test section of the specification, shall be repeated.
- G. The Seller shall submit his proposed testing procedure and method of analysis for Bechtel's approval at the time of quotation.
- H. The valve stresses associated with the functional test shall be shown by calculations to be within the allowable stress limits specified in Article 3 of this appendix.
- I. Test data and the associated stress calculations shall be submitted to and accepted by Bechtel prior to acceptance of the valve for shipment.

3. ALLOWABLE STRESS LIMITS

- A. Class 1 valves shall meet the stress limits given in Table C-2. It shall be assumed that the stress in the piping at its points of connection to the valve body inlet

and outlet nozzles is at the maximum value permitted by the code for the pipe for the design conditions specified in the data sheets, and that the pipe loading combination on the valve nozzles is being applied in the direction that will cause the maximum stress in the valve body.

Table C-2

Class 1 Valves

Plant Condition	Design Loading Combinations ⁽²⁾	Stress Limits ⁽¹⁾
Design	PD	The valve shall conform to the requirements of Section III, 1974 Paragraph NB3500
Normal	PO	
Upset ⁽⁴⁾	PO + OBE	NB3525
Emergency	PO	NB3526 ⁽³⁾
Faulted	PO + SSE	NB3527 ⁽³⁾

(1) As specified by ASME III, Division 1

(2) LEGEND: PD - Design pressure
PO - Operating pressure
OBE - Earthquake (inertia portion) (50 percent of SSE)
SSE - Earthquake (inertia portion)

(3) If the valve function must be ensured during emergency/faulted conditions, the valve will be identified as active in the valve listing in the procurement documents.

(4) As required by subsection NB or NF of ASME III, other loads, such as thermal transient and thermal gradients, may require consideration in addition to those primary stress-producing loads listed.

B. Class 2 and Class 3 valves shall be provided with calculations verifying compliance with the following conditions:

- 1) The section modulus and metal area at a plane normal to the flow passage through the region at the valve body crotch (for definition of crotch, see Section A-A of Figure NB-3545.2-1) are at least 10 percent greater than the section modulus and metal area of the piping connected (or joined) to the valve body inlet and outlet nozzles.

- 2) The allowable stress S for the valve body material is equal to or greater than the allowable stress S of connected piping material. If the valve body material allowable is less than that of the connected piping, the selection modulus and metal area at the valve body crotch as calculated in Subparagraph 3.B.1 shall be multiplied by the ratio $S(\text{pipe})/S(\text{valve})$ in satisfying the conditions in this subparagraph.
- 3) In lieu of the above requirements, the design-by-analysis procedures of NB-3545.2 may be followed.
- 4) In addition, valves shall be provided with calculations demonstrating compliance with the stress limits shown in Table C-3.

Table C-3

Class 2 and 3 valves (10)

Plant Conditions	Design Loading Combination (9)(10)	Stress Limits (1-7)	P_{max} (8)
Design	PD	The valve shall conform to the requirements of Section III Paragraph NC-3500 or ND3500, as applicable	1.0
Normal	PO		
Upset	PO + OBE	$S_m \leq 1.1S$ (S_m or SL) + S_b $\leq 1.65S$	1.1
Emergency	PO	$S_m \leq 1.5S$ (S_m or SL) + S_b ≤ 1.85	1.2
Faulted	PO + SSE	$S_m \leq 2.0S$ (S_m or SL) + S_b $\leq 2.4S$	1.5

(1) Definition of symbols:

- S_m = General membrane stress. This stress is equal to the average stress across the solid section under consideration. Excludes discontinuities and concentrations. Produced only by mechanical loads.
- S_l = Local membrane stress. This stress is the same as S_m except it includes discontinuities.
- S_b = Bending stress. This stress is equal to the linear varying portion of the stress across the solid section under consideration. Excludes discontinuities and concentrations. Produced only by mechanical loads.
- S = Allowable stress value given in ASME Section III, Appendix I, Table I-7.0 corresponding to the highest metal temperature at the section during the condition under consideration.

- (2) "Stress" means the maximum normal (or direct) primary stress. Classical bending and direct stress formulae where free body diagrams determine a simple stress distribution

that is in equilibrium with the applied loads, or any design formulae that have been demonstrated to be satisfactory may be used.

- (3) A casting factor of 1.0 shall be used in satisfying these limits.
 - (4) These requirements for the acceptability of the valve design are not intended to assure the functional adequacy of the valve.
 - (5) Design requirements listed in this table are not applicable to valve discs, stems, seat rings, or other parts of the valve that are contained within the confines of the body and bonnet.
 - (6) These rules do not apply to Class 2 and 3 safety or relief valves.
 - (7) Where valves are provided with topworks and where these topworks are essential to maintaining pressure integrity, the stress limits listed in this table shall be met by performing an analysis based on static forces resulting from equivalent earthquake accelerations acting at the centers of gravity of the extended masses for all conditions for which dynamic loadings are specified in the design specification.
 - (8) The maximum pressure during the condition under consideration shall not exceed a value equal to the design pressure multiplied by the corresponding factor listed under P_{max} for that condition.
 - (10) If valve function must be assured during emergency/faulted conditions, the valve will be identified as active in the valve listing in the procurement documents, and the specified emergency/faulted condition for the plant shall be considered as the normal condition for the valve.
 - (11) As required by subsections NC, ND, or NF of ASME III other loads, such as thermal transient and thermal gradients, may require consideration in addition to those primary stress-producing loads listed.
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