

VOLUME V

WPPSS

QUALIFICATION OF PURGE AND VENT VALVES AT WNP-2

ATTACHMENT H - IN-SITU TEST RESULTS

ATTACHMENT I - WPPSS FLOW CALCULATIONS

ATTACHMENT J - VENDOR (BIF) FLOW TEST AND RESULTS

- 1) TORQUE LOAD TESTS FOR STRAIGHT PIPE
- 2) TORQUE LOAD TESTS WITH CONNECTED ELBOW

ATTACHMENT K - FIELD MODIFICATIONS, PED & STARTUP WORK REQUESTS

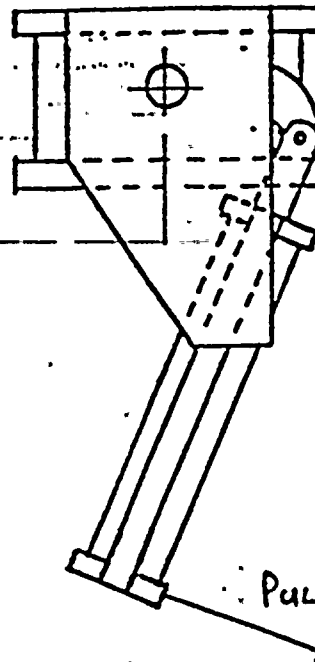
ATTACHMENT L - DRAWINGS

- 1) DEBRIS SCREEN PHOTOGRAPH
- 2) FLOW DIAGRAM M543
- 3) PIPING ISOMETRICS
- 4) VALVE DRAWINGS
- 5) OPERATOR DRAWINGS
- 6) VALVE DATA SHEETS

PRELIMINARY

Rev. C
Attachment 11
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FUNCTIONAL TEST REQUIREMENTS

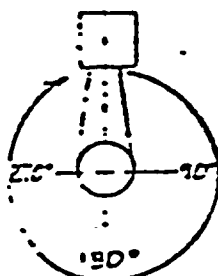


CSP-A0-1 TEST LOADING SKETCH - NO SCALE

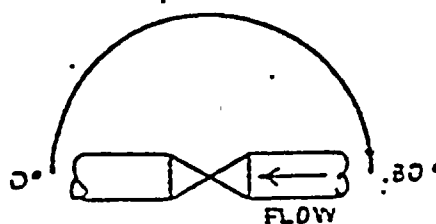
EPN ~~CSP-A0-1~~ QID 018001 CONTRACT NO. 68
DESCRIPTION FAIR CLOSED - 10" BORE AIR OPERATOR BLDG. R ELEV 558
ACTUATOR WT. 593 # MAX "g" 4.44
AIR PRESS. 100 PSIG or Volts — Amps — AC — DC —
ACTUATOR C.G. FROM PIPE C.L. N/A
OPER. TIME REQ'D. - OPEN — - CLOSED —
ALLOWABLE SEAT LEAKAGE N/A REVERSE N/A
SYSTEM - TEST PRESS. N/A + — PSIG - DIFF. PRESS. N/A + — PSID
MAX. TEST LOAD 1110 + 25 LBS.
TEST LOAD DIRECTION - AXIAL * + 4 1/2 ° LATERAL * + 4 1/2 °

Looking in Flow Direction

* SEE SKETCH



AXIAL



LATERAL

Justin
Prepared by
11/3/83
Date

TEST SUMMARY

Rev. 1

Page 1 of 2

Title In-Place Valve Functional Testing

No. SLT-S304.1-3

System Engineer R. JABLONSKI

Date 11-7-83

Project WNP-2

CSP-AO-1

REMARKS

0930 BRIEFED TEST CREW AND SHIFT SUPERVISOR OF TEST. COMMENCED SETUP OF TEST EQUIPMENT.

1000 STROKED VALVE UNDER NO LOAD CONDITIONS RESULTS WERE AS FOLLOWS:

OPEN

CLOSE

7.05 SEC

6.3 SEC.

1010 ADDED 200 LBS LOAD AND STROKED VALVE.

1015 ADDED LOAD AT 100 LBS INCREMENTS STROKED VALVE AND RECORDED RESULTS AS FOLLOWS.

AS FOLLOWS.

OPEN

CLOSE

300 LBS

7.6

4.8

400 LBS

9.09

4.1

500 LBS

10.6

2.8

600 LBS

13.1

3.8

700 LBS

10.4

4.5

THE VALVE WOULD NOT STROKE WITHOUT MANUALLY LISTING THE LOAD UP AND DOWN. WHEN THIS WAS DONE THE VALVE DID STROKE HOWEVER THE STROKE

TIMES WERE NOT APPLICABLE AS THE STROKE WAS DEPENDENT ON MANUAL LISTING OF LOAD.

RECORD COPY

Title In-Place Valve Functional TestingNo. SLT-S304.1-3System Engineer R. JablewskiDate 11-7-83Project WNP-2REMARKS

1030 APPLIED 800, 900, 1000 AND 1100 LB LOAD AND STROKED VALVE.

RESULTS WERE SAME AS MENTIONED ABOVE. THE LOAD NEEDED TO BE MANUALLY VIBRATED.

1045 REMOVED LOAD AND STROKED VALVE. RESULTS WERE:

OPEN

CLOSE

7.1 SEC

4.9 SEC.

1100 REMOVED TEST EQUIPMENT RETURNED SYSTEM TO NORMAL.

VALVE OPERATED SATISFACTORY AS LONG AS A CYCLIC LOAD WAS APPLIED AS SIMULATED BY MANUALLY VIBRATING THE LOAD. VALVE WOULD NOT FUNCTION UNDER STATIC LOAD.

Engl 11-7-83

RECORD COPY

DATA SHEET

EPN CSP-AO-1

INITIALS/DATE

Prerequisites have been met and system is lined up for testing

RF 11-7-83

- 6.1 Seat leakage equipment installed
- 6.2 Air pressure reduced to N/A PSIG
- 6.3 Torque switches operable
- 6.4 Reduced voltage applied N/A volts
- 6.5 Electrical and valve lineup completed
- 6.6 Pretest seat leakage N/A

N/A 1

N/A 1

N/A 1

N/A 1

RF 11-7-83

N/A 1

6.7 Time (seconds) OPENING CLOSING
2.05 6.3

Volts			I.D. NO.	
Amps start			Cal. Due	
Amps run			I.D. NO.	
Amps torque			Cal. Due	
6.8 System Press. _____ PSIG				
Differential Press. _____ PSID				

6.9 50% static load 500 LBS.

I.D. NO. 41459

Cal. Due 3-30-84

RF 11-7-83

6.10, 6.11 Time (seconds) OPENING CLOSING
10.6 2.8

Volts			I.D. NO.	
Amps start			Cal. Due	
Amps run			I.D. NO.	
Amps torque			Cal. Due	

RECORD COPY

DATA SHEET

EPN CSP-AO-1

6.12 75% static load 800 LBS.

INITIALS/DATE

I.D. NO. 41459
Cal. Due 3-30-84
RF 111-7-83

6.13, 6.14

OPENING

CLOSING

Time (seconds)

N/A

N/A

Volts

Amps start

Amps run

Amps torque

I.D. NO.

Cal. Due

I.D. NO.

6.15 100% static load 11000 LBS.

I.D. NO. 41459

Cal. Due 3-30-84
RF 111-7-83

6.16, 6.17

OPENING

CLOSING

Time (seconds)

N/A

N/A

Volts

Amps start

Amps run

Amps torque

I.D. NO.

Cal. Due

I.D. NO.

Cal. Due

6.18, 6.19

OPENING

CLOSING

Time (seconds)

N/A

N/A

Volts

Amps start

Amps run

Amps torque

I.D. NO.

Cal. Due

I.D. NO.

Cal. Due

RECORD COPY

DATA SHEET

EPN CSP-A0-1

INITIALS/DATE

6.20

Time (seconds)

OPENING

CLOSING

7.1

4.9

Volts

Amps start

Amps run

Amps torque

I.D. NO.

Cal. Due

I.D. NO.

Cal. Due

6.21 Post test seat leakage _____

6.22 Reverse seat leakage _____

6.23 Packing gland leakage _____

6.24 Valve normal power or air restored

6.25 Load fixture removed

6.26 Leak test equipment removed

6.27 Torque switch bypass wiring restored

N/A 1

N/A 1

N/A 1

Pff 11-7-83

Pff 11-7-83

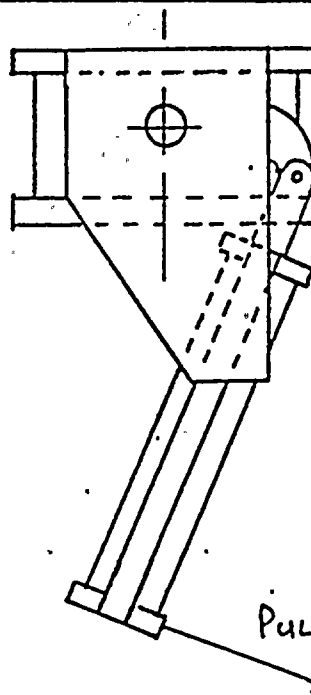
N/A 1

N/A 1

Engel 11-7-83
Verified by Date

RECORD COPY

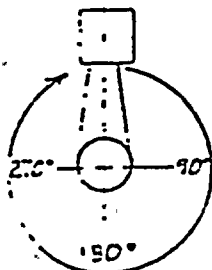
FUNCTIONAL TEST REQUIREMENTS



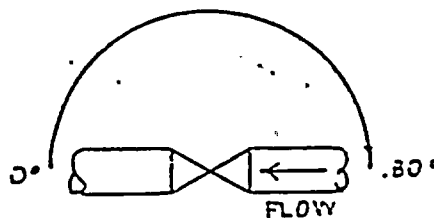
PULL TO NEARBY SUPPORT

TEST LOADING SKETCH - NO SCALE

EPN CEP-A0-2A QID 018001 CONTRACT NO. 68
DESCRIPTION FAIL CLOSED - 10" BORE AIR OPERATOR BLDG. R ELEV 558
ACTUATOR WT. 593 # MAX "g" 4.44
AIR PRESS. 100 PSIG or Volts — Amps — AC — DC —
ACTUATOR C.G. FROM PIPE C.L. N/A
OPER. TIME REQ'D. - OPEN — - CLOSED —
ALLOWABLE SEAT LEAKAGE N/A REVERSE N/A
SYSTEM - TEST PRESS. N/A + — PSIG - DIFF. PRESS. N/A + — PSID
MAX. TEST LOAD 1110 + 25 LBS.
TEST LOAD DIRECTION - AXIAL * + 4 1/2 ° LATERAL * + 4 1/2 °
Looking in Flow Direction * SEE SKETCH



AXIAL



LATERAL

Handwritten signature 11-3-83

Handwritten signature
Prepared by

11/3/83

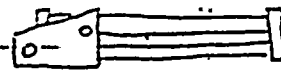
Date

L.C. (CLAS) 1.14'13

GLOBAL

EPN

X Y Z
4.57 1.26 0.90



0.90
1.26
4.57
0.89
2.10
3.54

$\sqrt{y^2 + z^2}$
1.55

361106

CEP-V-3A
FC

2A' VALVE
8" CYL

CEP-V-4A
FC

3.71 1.34 0.89

CSP-V-3
FC

2.04 3.17 3.76

3.17
3.76
2.04

4.92

CSP-V-4
FC

1.87 2.87 4.19

2.87
4.19
1.87

5.08

CSP-V-5
FO

1.62 3.52 2.55

3.02
3.52
3.02

4.27

CSP-V-6
FO

2.55 3.33 5.85

3.33
5.85
2.55

SEE NOTE 2

3.62

CSP-V-9
FO

2.57 1.73 2.67

2.67
1.73
2.57

3.18

361104

CEP-V-1A SEE NOTE 1
FC

1.93 2.23 1.85

1.85
2.23
1.93

2.90

30" VALVE
10" CYL

CEP-V-2A SEE NOTE 1
FC

0.96 2.11 1.16

1.16
2.11
0.96

2.61

CSP-V-1
FC

1.46 3.67 1.74

3.67
2.27
2.27

4.32

CSP-V-2

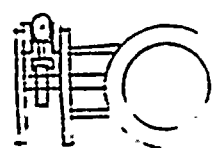
1.44 3.57 1.90

3.57
2.38
2.38

4.71

NOTE 1

ORIENTATION ASSUMED:



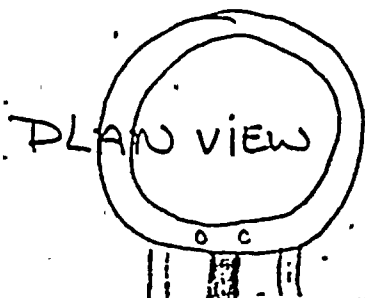
NOTE 2:

FROM CES CALC DT. 01.F, QID 361106,
P 43.8 MAX ANGLE OF MOTION = 14°
∴ AXIAL COMPONENT TO A/D TS
WEAK AXIS = 5.55 sin 14° = 1.42

PRELIMINARY

SLT-S304.0-3
Rev. 0
Attachment II
Page 1 of 1

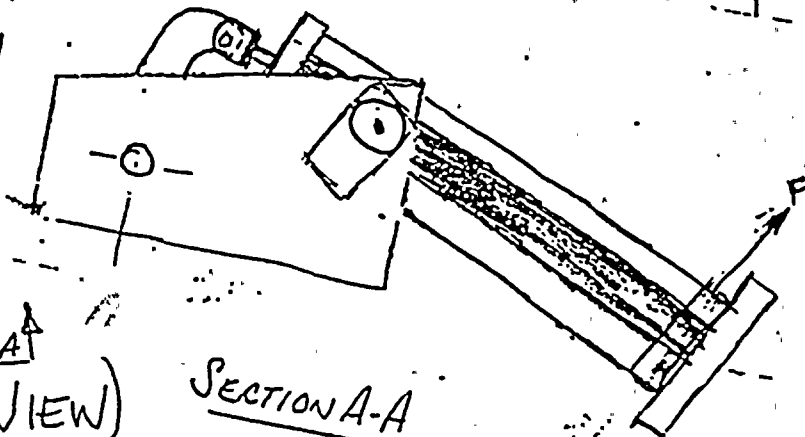
FUNCTIONAL TEST REQUIREMENTS



A
↑

PLAN CSP-V-3,4 (TYP VIEW)

Vertical
W
ON

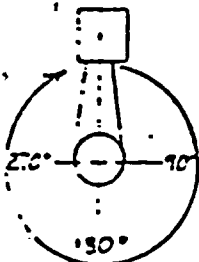


TEST LOADING SKETCH - NO SCALE

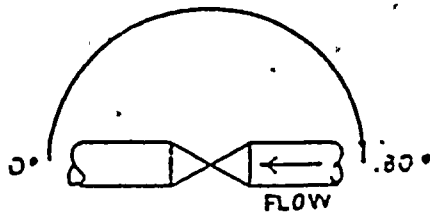
EPN 02-CSP-A0-25 QID 018001 CONTRACT NO. _____
DESCRIPTION 8" Air CYLINDER BLDG. R ELEV 481
ACTUATOR WT. 399# MAX "g" 6.17
AIR PRESS. _____ or Volts _____ Amps _____ AC _____ DC _____
ACTUATOR C.G. FROM PIPE C.L. N/A
OPER. TIME REQ'D. - OPEN _____ - CLOSED _____
ALLOWABLE SEAT LEAKAGE _____ REVERSE _____
SYSTEM - TEST PRESS. _____ + _____ PSIG - DIFF. PRESS. _____ + _____ PSID
MAX. TEST LOAD 960 + 5 LBS.
TEST LOAD DIRECTION - AXIAL * + _____ ° LATERAL * + _____ °

Looking in Flow Direction

SEE SKETCH



AXIAL



LATERAL

FLBuck
Prepared By

6/1/83
Date



DATA SHEET

EPN CSP-A0-5

INITIALS/DATE

Prerequisites have been met and system is lined up for testing

6.1 Seat leakage equipment installed

Raff 110-28-83
N/A 1

6.2 Air pressure reduced to N/A PSIG

N/A 1

6.3 Torque switches operable

Raff 110-29-83

6.4 Reduced voltage applied N/A volts

N/A 1

6.5 Electrical and valve lineup completed

N/A 1

6.6 Pretest seat leakage N/A

N/A 1

6.7

OPENING

CLOSING

Time (seconds)

6.93

162

Volts			I.D. NO.	
			Cal. Due	
Amps start			I.D. NO.	
Amps run				
			Cal. Due	
Amps torque				

6.8 System Press. N/A PSIG

Differential Press. N/A PSID

N/A 1

6.9 50% static load 480 LBS.

I.D. NO. 41462
Cal. Due 3-30-84
Raff 110-28-83

6.10, 6.11

Time (seconds)

OPENING

CLOSING

6.31

3.34

Volts			I.D. NO.	
			Cal. Due	
Amps start			I.D. NO.	
Amps run			Cal. Due	
Amps torque				

RECORD ADV

DATA SHEET

EPN CSP-A0-5

6.12 75% static load 720 LBS.

INITIALS/DATE

I.D. NO. _____

Cal. Due _____

6.13, 6.14

Time (seconds)

OPENING

7.63

CLOSING

NO CLOSE

Removed weights To 580# To close

Volts				I.D. NO.	
Amps start				Cal. Due	
Amps run				I.D. NO.	
Amps torque					

6.15 100% static load 960 LBS.

I.D. NO. _____

Cal. Due _____

6.16, 6.17

Time (seconds)

OPENING

7.63

CLOSING

NO CLOSE

Removed weights To 580# To close

Volts				I.D. NO.	
Amps start				Cal. Due	
Amps run				I.D. NO.	
Amps torque				Cal. Due	

6.18, 6.19

Time (seconds)

OPENING

7.70

CLOSING

NO CLOSE

Removed weights To 580# To close

Volts				I.D. NO.	
Amps start				Cal. Due	
Amps run				I.D. NO.	
Amps torque				Cal. Due	

RECORD COPY

DATA SHEET

EPN CSP-A0-5

INITIALS/DATE

6.20

Time (seconds)

OPENING

6.86

CLOSING

2.27

Volts						I.D. NO.					
						Cal. Due					
Amps start						I.D. NO.					
Amps run						Cal. Due					
Amps torque											

6.21 Post test seat leakage

N/A

N/A 1

6.22 Reverse seat leakage

N/A

N/A 1

6.23 Packing gland leakage

N/A

N/A 1

6.24 Valve normal power or air restored

Ref 110-28-83

6.25 Load fixture removed

Ref 110-28-83

6.26 Leak test equipment removed

N/A 1

6.27 Torque switch bypass wiring restored

N/A 1

R. J. Hill
Verified by

10-28-83
Date

TEST SUMMARYPage 1 of 2Title In-Place Valve Functional TestingNo. SLT-S304.1-3System Engineer RON J. JABLONSKIDate 10-28-83Project WNP-2REMARKS

0700 BRIGGED TEST CREW AND SHIFT foreman
Commenced setup of TEST Equipment.

0730 TRIED TO STROKE VALVE BUT VALVE
would NOT STROKE

1100 Found out BECTEL installed OPERATOR
ARM OUT 360° HAD TO REMOVE
~~ARM AND ROTATE SHUTT 360°~~ 80°
VALVE would OPERATE.

1200 STROKED VALVE SATISFACTORY AND
RECORDED VALVE DATA on DATA
SHEET.

1220 Added 50% Load 480# AND
STROKED VALVE SATISFACTORY.

1230 Added 75% weight 720# AND
WENT TO THE OPEN POSITION HOWEVER
VALVE WOULD NOT SHUT. REMOVED
LOAD UNTIL 580# VALVE SHUT.

1240 Added 960# REPEAT of ABOVE
VALVE OPENED but would NOT
SHUT UNTIL ONLY 580# LOAD.

RECORD COPY

TEST SUMMARY

Rev. 1
Page 2 of 2

Title In-Place Valve Functional Testing

No. SLT-S304.1-3

System Engineer Ron J. Foster

Date 10-28-83

Project WNP-2

REMARKS

1250 Removed Load STAGED VALVE
SATISFACTORILY.

RETURNED SYSTEM TO NORMAL

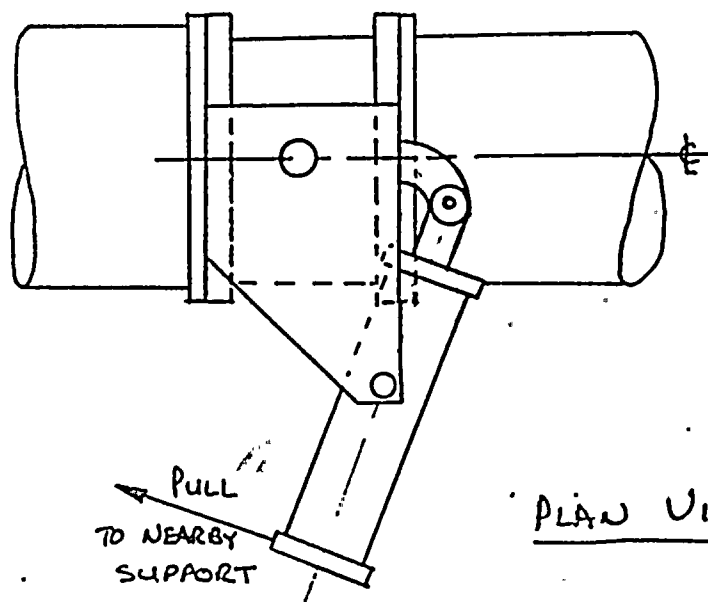
Ron J. Foster 10-28-83

NOTE: VALVE WILL NOT TEST
AS REQUIRED. VALVE IS
NOT DESIGNED TO BE
STATICALLY LOADED AND
OPERATE. ~~RE~~

RECORD COPY

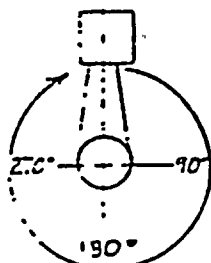
FUNCTIONAL TEST REQUIREMENTS

REV 1

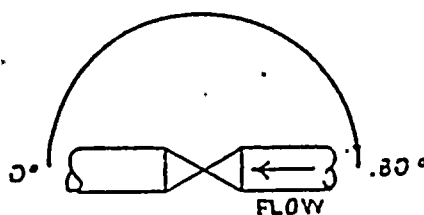


TEST LOADING SKETCH - NO SCALE

EPN CSP-A0-5 QID 018001 CONTRACT NO. 68
DESCRIPTION FAIL OPEN 8" BONE AIR OPERATOR BLDG. R ELEV 475
ACTUATOR WT. 420[#] MAX "g" 8.74
AIR PRESS. 100 PSIG or Volts — Amps — AC — DC —
ACTUATOR C.G. FROM PIPE C.L. N/A
OPER. TIME REQ'D. - OPEN — - CLOSED —
ALLOWABLE SEAT LEAKAGE N/A REVERSE N/A
SYSTEM - TEST PRESS. N/A + — PSIG - DIFF. PRESS. N/A + — PSID
MAX. TEST LOAD 1140 + 25 LBS.
TEST LOAD DIRECTION - AXIAL * + 4 1/2 ° LATERAL * + 4 1/2 °
Looking in Flow Direction * SEE SKETCH



AXIAL



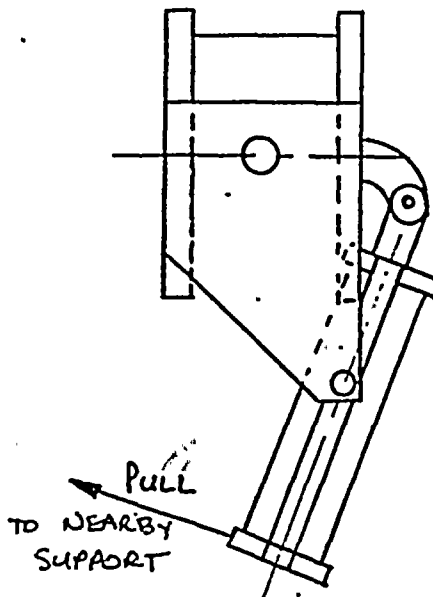
LATERAL

Jim Mue 11-3-83

J. M. Mue
Prepared by

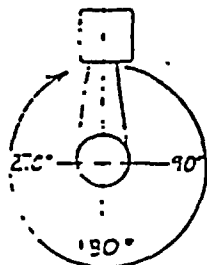
11/3/83
Date

FUNCTIONAL TEST REQUIREMENTS

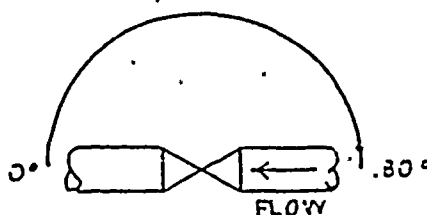


TEST LOADING SKETCH - NO SCALE

EPN CEP-A0-4A QID 018001 CONTRACT NO. 68
 DESCRIPTION FAIL CLOSED- 8" Bore AIR OPERATOR BLDG. R ELEV 495
 ACTUATOR WT. 420 MAX "g" 5.12
 AIR PRESS. 100 PSIG or Volts — Amps — AC — DC —
 ACTUATOR C.G. FROM PIPE C.L. N/A
 OPER. TIME REQ'D. - OPEN — - CLOSED —
 ALLOWABLE SEAT LEAKAGE — REVERSE —
 SYSTEM - TEST PRESS. N/A + — PSIG - DIFF. PRESS. N/A + — PSID
 MAX. TEST LOAD 1005 + 25 LBS.
 TEST LOAD DIRECTION - AXIAL * + 4 1/2 ° LATERAL * + 4 1/2 °
 Looking in Flow Direction * SEE SKETCH



AXIAL



LATERAL

W/M 11-2-83

J. M. Strohman
Prepared by

11/2/83
Date



WASHINGTON PUBLIC POWER SUPPLY SYSTEM

CALCULATION COVER SHEET

SHEET 1 OF 10

PROJECT <u>WNP-2</u>	DISCIPLINE <u>Safety Analysis (ME)</u>	CALC. NO. <u>ME-02-83-65</u>
CONTRACT <u>68</u>	SPECIFICATION <u>2808-68</u>	QUALITY CLASS <u>1</u>
SYSTEM NO. <u>22.0</u>	EQUIPMENT PIECE NO. <u>CEP-V-3A, -4A</u>	

SUBJECT
Much Number of flow in CEP-3c''
Briefly values following a postulated LOCA

ACTION REQUIRED

☐ SAR CHANGE ☐ SPEC. CHANGE ☐ OTHER (IDENTIFY BELOW)

ATTACHMENTS

☐ COMPUTER PRINTOUT ☐ VERIFICATION CHECKLIST

OTHER (IDENTIFY) Data sheet of Valve K Valve vrisu-
Value Aug/C

VERIFICATION REQUIREMENT YES ☐ NO ☒ REASON NOT USED IN DESIGN - check on vendor method

APPROVED/DATE 12/12/83

TYPE OF CALCULATION	REMARKS	SUPERSEDES

☐ PRELIMINARY

☒ FINAL

SUPERSEDED BY

REV. NO.	REVISION DESCRIPTION	CALCULATION BY	DATE	CHECKED	DATE	APPROVED	DATE
0	original	D. E. Bask	12/1/83	F. J. J.	12/1/83	[Signature]	12/1/83

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

CALCULATION CONTINUATION SHEET

CALC NO. 311-02-82-08-0

SHEET 2 OF 16

PROBLEM

Determine the velocity and Mach # of flow through the Purge and Vent system as a function of Valve angle. It is desirable to keep the Mach # through the Isolation valves below 0.3. Since test data on the valves were obtained from water tests, not air tests. The NRC consultants have informed WPPSS that the water test data is reasonable if the Mach # is below 0.3. The major concern is if the velocity & Mach # are too high the closing Torques on the butterfly valves may be too high. A previous calculation (#ME-02-82-08-0), reference 1 calculated the velocity through the first valve with the valve wide open. Data will be used from reference 1.

REVISION INDICATIONS

CHECKED (INITIALS/DATE)

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

CALCULATION CONTINUATION SHEET

CALC NO. 101-02-82-08-0SHEET 3 OF 10References

1. WPPSS Calc #ME-02-82-08-0, "Mass flow Rates and velocities through CEP 30" Butterfly Valves
2. Crane Technical Paper 410
3. K value vs Valve Angle for BIFF Butterfly Valves - copy attached to Calc
4. Fluid Mechanics, Streeter & Wylie McGraw Hill Book Co.

Calculation

In order to assure the Mach # is < 0.3 in the isolation valves, the valves will have their opening angle limited. This calculation will determine the Mach # at various angles. As in reference 1, only the 30" CEP line will be evaluated as it is the shortest and will therefore have the lowest flow resistance.

The Vent & purge lines will get a FAZ signal after a postulated LOCA. It is assumed that there is a 1 second

REVISION INDICATIONS

CHECKED (INITIALS/DATE)

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

CALCULATION CONTINUATION SHEET

CALC NO. 222

SHEET 4 OF 10

REVISION INDICATIONS

delay. The valves are tested to assure a closing time of 4 seconds. Therefore at 1 second the valve will start to close and will be fully closed by 5 seconds. To be conservative the Mach # and velocity will be determined at 5 seconds after a postulated LOCA,

From Reference 1, the temperature, pressure and specific volume in the containment are:

Time after LOCA	$\frac{P}{\text{PSIG PSIA}}$		$\frac{T}{\text{OF OR}}$		\bar{V}_{air} ft ³ /lb	\bar{V}_{steam} ft ³ /lb
5.0	28.9	43.6	268	728	6.18	9.6

The K_{valve} of the system except for the 3 valves (valves V1A, V2A, V11) are obtained from Reference 1

$$K = K_{\text{Total}} - K_{\text{valves}}$$

$$K = 6 - 3(.27) = \underline{5.19}$$

$$\therefore K_{\text{Total}} = 5.19 + 3 K_{\text{valve}}$$

CHECKED (INITIALS/DATE)

CALCULATION CONTINUATION SHEET

CALC NO. 101-1-1-1-1-1SHEET 5 OF 10

REVISION INDICATIONS

$$W = 0.525 Y d_1^2 \sqrt{\frac{\Delta P}{K \bar{V}}}$$

$$d = 29$$

$$\Delta P = 28.9$$

$$\frac{\Delta P}{P} = \frac{28.9}{28.9 + 14.7} = 0.66$$

$$\bar{V}_{air} = 6.18$$

$$\bar{V}_{steam} = 9.6$$

$$W_{air} = 0.525 Y (29)^2 \sqrt{\frac{28.9}{K (6.18)}}$$

$$= 954.8 \frac{Y}{\sqrt{K}}$$

$$W_{steam} = 0.525 Y (29)^2 \sqrt{\frac{28.9}{K (9.6)}}$$

$$= 766.1 \frac{Y}{\sqrt{K}}$$

To obtain W_{steam} get
 Y from P_2 A22 of Ref 2
 at the applicable value of K
 using $k = 1.4$ for air
 $k = 1.3$ for steam

$$v = \frac{W}{A} \bar{V} \quad ; \quad A = \frac{\pi (29)^2}{4} = 4.587$$

$$v_{air} = \frac{W (6.18)}{4.587} = 1.3473 W$$

$$v_{steam} = \frac{W (9.6)}{4.587} = 2.0929 W$$

CHECKED (INITIALS/DATE)

☒ ☒ ☒ ☒ ☒

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

CALCULATION CONTINUATION SHEET

CALC NO. 151SHEET 6 OF 10

Sonic flow

$$C = \sqrt{\gamma R T}$$

Ref 4

$$C_{air} = \sqrt{1.4(32.17)(53.3)(728)}$$

$T=268F$

$$= 1322 \text{ fps}$$

Ref 4

$$C_{steam} = \sqrt{1.3(32.17)(858)(728)}$$

$T=268F$

$$= 1616$$

Ref 4

REVISION INDICATIONS

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J. D. A. 2.1

CALCULATION CONTINUATION SHEET

CALC NO. 101

SHEET 7 OF 10
REVISION INDICATIONS

velocity & Mach # at pipe entrance

GAS	α°	K_{valve}^*	K_T	γ^{**}	w lb/sec	V fps	Mach No.
AIR	50	5.8	22.59	.775	155.68	209.7	.159
	60	2.3	12.09	.745	204.57	275.6	.209
	70	0.87	7.80	.725	247.86	333.9	.253
	80	0.3	6.09	.718	277.79	374.3	.283
	90	0.24	5.91	.710	279.7	376.9	.285
Steam	50	5.8	22.59	.775	124.9	261.4	.162
	60	2.3	12.09	.750	165.25	345.9	.214
	70	0.87	7.80	.730	200.25	419.1	.259
	80	0.3	6.09	.720	223.52	467.8	.290
	90	0.24	5.91	.715	225.32	471.6	.292

* From curve of K_{valve} versus opening angle, use value class 25B-75A-75B
 Since at $\alpha = 90$ $K = 0.24$ and valve data sheet gives $K = 0.27$ at $\alpha = 90$.

** Fig A22 of Crane TP 410 (Ref. 2)
 for air use curve for $k = 1.4$
 for steam use curve for $k = 1.3$

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CALCULATION CONTINUATION SHEET

CALC NO. E-1000-100

SHEET 8 OF 10

REVISION INDICATIONS

Table I presents the velocity & Mach Number for the 30" CEP line at the entrance of the pipe for both air and steam flow.

Next a check will be made of the Mach # at the entrance to the second (outboard) isolation valve at valve opening angles of 70° and 90° . Since the Mach numbers are almost the same for air or steam flow, this will be evaluated for steam flow only. Since the Mach # is higher for steam flow.

There is ~ 20.2 ft of pipe between the pipe entrance and the inlet of the outer isolation valve.

$$K_{\text{pipe}} = f \frac{L}{D} = 0.011 \left(\frac{20.2}{29/12} \right) = 0.092$$

$$K_{\text{inlet}} =$$

$$K_{\text{valve}} =$$

$$\alpha = 70$$

$$K' = \frac{0.87}{1.462}$$

where K' is the loss coefficient between the pipe entrance and the inlet of the 2nd isolation valve

Since

$$W = 0.525 / d^2 \sqrt{\frac{A P}{K D}}$$

$$\Delta P = \left(\frac{W}{0.525 / d^2} \right)^2 K D$$

Assume

$$\Delta P = 3.2$$

$$\frac{\Delta P}{P} = \frac{3.2}{28.9 + 19.7} = 0.07$$

$$\gamma \approx 0.95$$

CHECKED (INITIALS/DATE)

CALCULATION CONTINUATION SHEET

CALC NO. 1111

SHEET 7 OF 10

$$\Delta P = \left[\frac{200.25}{-525(1.95)(29)^2} \right]^2 (1.462)(9.6)$$

$$= 3^2 \text{ good agreement}$$

\therefore pressure at inlet to second valve is

$$P_2 = 28.9 + 14.7 - 3.2 = 40.4$$

The velocity at the inlet is

$$v_2 = v_1 \left(\frac{P_1}{P_2} \right) \quad \text{assuming isothermal flow since } \bar{v} \sim \frac{1}{P}$$

$$\therefore v_2 = 419.1 \left(\frac{28.9 + 14.7}{40.4} \right) = 452.3$$

$$M = \frac{v}{c_s} = \frac{452.3}{1616} = 0.280$$

This shows that at a valve opening of 70° , the Mach # at the entrance to both the inner and outer isolation valve is < 0.3 .

Next repeat the calculation for $\alpha = 90$
assume

$$\Delta P = 3.5$$

$$\frac{\Delta P}{P} = \frac{3.5}{28.9 + 14.7} = 0.08$$

$$\gamma \approx 0.945$$

REVISION INDICATIONS

CHECKED (INITIALS/DATE)

R. J. . . .

CALCULATION CONTINUATION SHEET

CALC NO. 111SHEET 10 OF 10

$$\Delta p = \left[\frac{225.32}{.525(1.945)29^2} \right]^2 (1.462)(9.6) = 4.01$$

$$\text{use } \Delta p = 4.1$$

$$P_2 = 28.9 + 14.7 - 4.1 = 39.5$$

$$v_2 = 471.6 \left(\frac{28.9 + 14.7}{39.5} \right) = 520.6$$

$$M = \frac{520.6}{1616} = 0.322$$

This shows that the Mach # at the inlet to the second valve is slightly greater than 0.3 if the butterfly valves are fully open and the containment is at a pressure of 28.9 psig. Since the valves will be closed by 5 seconds after a LOCA the Mach Number would not exceed 0.3 for either the inner or outer isolation valve during a LOCA Transient. If the valve position versus time is accounted for.

REVISION INDICATIONS

CHECKED (INITIALS/DATE)

LOSS COEFFICIENT FOR MODELS 651, 652 & 653 BURESEAL BUTTERFLY VALVE



Fig. 6

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

CALCULATION COVER SHEET

SHEET 1 OF 12

PROJECT <u>WPPSS - WNP #2</u>	DISCIPLINE <u>EQUIPMENT QUALIFICATION</u>	CALC. NO. <u>EQ-02-83-018001-4</u>
CONTRACT <u>68</u>	SPECIFICATION <u>2800-68</u>	QUALITY CLASS <u>I</u>
SYSTEM NO. <u>CSP, CEP</u>	EQUIPMENT PIECE NO. <u>CSP-V-1, CEP-V-AA, CSP-V-5</u>	
SUBJECT <u>STATIC Pull OPERABILITY TEST</u>		

ACTION REQUIRED

☐ SAR CHANGE☐ SPEC. CHANGE☒ OTHER (IDENTIFY BELOW)

DETERMINE STRESSES DUE TO OPERABILITY TEST LOADS
FOR THE FOLLOWING ELEMENTS: (1) DRIVE RODS
(2) BUSHING

ATTACHMENTS

☐ COMPUTER PRINTOUT☐ VERIFICATION CHECKLIST

OTHER (IDENTIFY)

NONE

VERIFICATION REQUIREMENT	YES <input type="checkbox"/>	NO <input type="checkbox"/>	REASON	APPROVED/DATE
TYPE OF CALCULATION				SUPERSEDES
REMARKS				
<input type="checkbox"/> PRELIMINARY				SUPERSEDED BY
<input checked="" type="checkbox"/> FINAL				

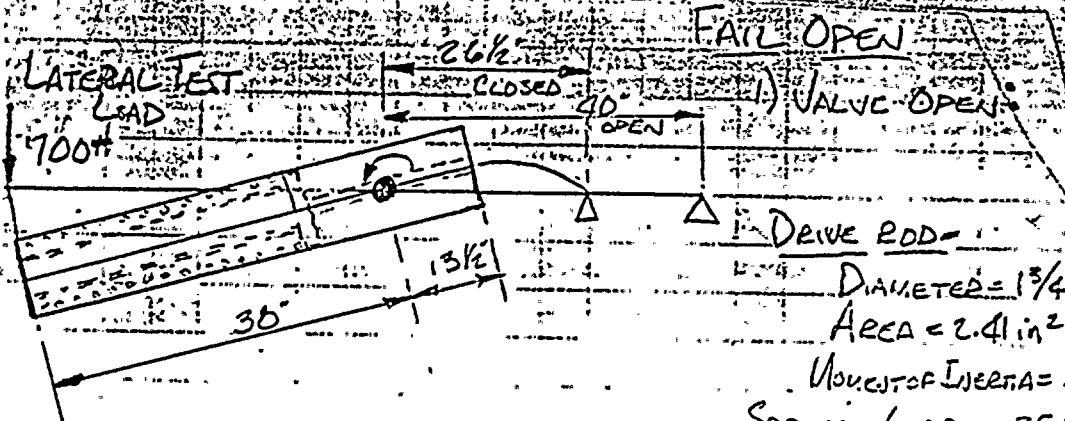
REV. NO.	REVISION DESCRIPTION	CALCULATION BY	DATE	CHECKED	DATE	APPROVED	DATE
<u>0</u>	<u>ORIGINAL ISSUE</u>	<u>A.V. SERIPEPO</u>	<u>12/12/82</u>	<u>Milton Meyer</u>	<u>12-14-82</u>	<u>[Signature]</u>	<u>12/15/83</u>

CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-018001-4

SHEET 2 OF 12

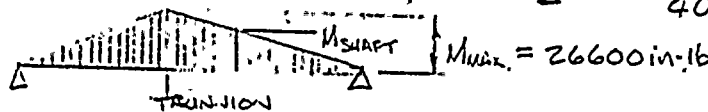
VALVE CSP-V-5 DRIVE ROD STRESSED



SPRING LOAD - 350# CLOSED
(Rod Compression) 1850# OPEN

$$M_{(TENSION)} = 7000(38) = 26600 \text{ in-lb}$$

$$R = \frac{M}{L} = \frac{26600}{40} = 665 \text{ lb}$$



VALVE OPEN:

(NO TENSILE STRESS DUE TO SPRING FORCE)

$$\sigma_{END} = \frac{Mc}{I} = \left(\frac{26.5}{40}\right) \frac{26600 \left(\frac{1.75}{2}\right)}{(.46)} = 33521 \text{ PSI}$$

$$\tau = \frac{R}{A} = \frac{665}{2.41} = 276 \text{ PSI}$$

$$\sigma_{AIR} = \frac{3521}{2.41} = 1461 \text{ PSI}$$

$$\sigma_{TOTAL} = \sigma_{AIR} + \sigma_{END} \Rightarrow 34982 \text{ PSI}$$

MAX PRINCIPAL STRESS:

$$\frac{34941}{2} + \sqrt{\left(\frac{34941}{2}\right)^2 + (276)^2} = 34941 \text{ PSI}$$

— ROD STRESS OK —

NOTE: $\sigma_{OPERATIONAL} = 5525 \text{ PSI}$ (COMPUTER RUN)

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MJM

12-14-83

CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-018001-4

SHEET 3 OF 12

REVISION INDICATIONS

VALVE: CSP-V-5

VALVE CLOSED

(NO TENSILE STRESS DUE TO
SPRING FORCE)

$$\sigma_{\text{BEND}} = \frac{Mc}{I} = \left(\frac{13}{26\frac{1}{2}}\right) \frac{26600 (1.75/2)}{(.46)} = 24822 \text{ PSI}$$

$$R = \frac{M}{L} = \frac{26600}{26.5} = 1004 \frac{\text{lb}}{\text{in}}$$

$$\tau = \frac{1004}{2.41} = 417 \text{ PSI}$$

$$\sigma_{\text{AIR}} = 1461 \text{ PSI}$$

$$\sigma_{\text{TOTAL}} \Rightarrow 1461 + 24822 = 26283 \text{ PSI}$$

MAX PRINCIPAL STRESS:

$$\frac{26283}{2} + \sqrt{\left(\frac{26283}{2}\right)^2 + (417)^2} = 26290 \text{ C. 86400}$$

- ROD STRESS OK -

CHECKED (INITIALS/DATE)

MJM

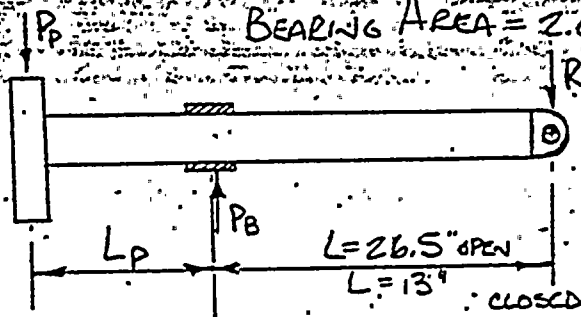
12-11-83

CALCULATION CONTINUATION SHEET

CALC NO. EQ-22-82-018001-4

SHEET 4 OF 12

VALVE CSP-V-5 BUSHING STRESS

BUSHING MAT'L → GRAY IRON
MIN. TENSILE IS 40,000 PSIBEARING AREA = 2.075 in²R_{OPEN} = 665#R_{CLOSED} = 1004#NOTE:EXACT POSITION OF PISTON IS NOT KNOWN
(ALTHOUGH STROKE = 15")

GOVERNING EQUATION:

$$P_B = P_P + R \quad ; \quad P_P(L_P) = R(L)$$

$$P_B = R \left(\frac{L}{L_P} \right) + R$$

SPRING PRELOAD = 350# K = 100#/in

ASSUME 3 1/2" FROM BUSHING (OPEN POSITION)

$$P_{B, OPEN} = 665 \left(\frac{26.5}{3.5} \right) + 665 = 5700\#$$

$$P_{B, CLOSED} = 1004 \left(\frac{13}{16.5} \right) + 1004 = 1710\#$$

BUSHING STRESS: $\frac{P_B}{B.A.} =$

OPEN POSITION: 2747 PSI

CLOSED POSITION: 824 PSI

O.K.

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MJM

12-19-83

Attachment

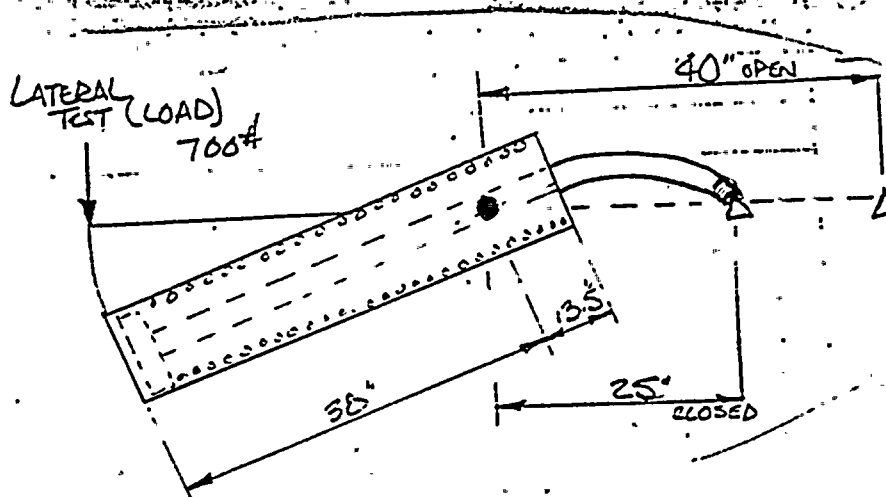
Ref 1 Appendix B page 3

CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-018001-4SHEET 5 OF 12

REVISION INDICATIONS

B. MILLER AIR CYLINDER FAIL CLOSED
CEP-V-4A

ROD STRESS:

SPRING LOAD:
 INITIAL = 1500#
 FINAL = 3000#

FOR EQUAL TEST LOADS, APPLIED (SAME LOCATION) TO BOTH THE FAIL-OPEN AND FAIL-CLOSED VALVES WILL RESULT IN THE SAME STRESS LEVELS IN DRIVE ROD. SLIGHT DIFFERENCE DUE TO FOLLOWING:

- 1.) THE DRIVE ROD IS PUT IN TENSION DUE TO SPRING FORCE AS OPPOSED TO AIR PRESSURE.
- 2.) DIFFERENCE IN CLOSED LENGTH 25" VS 26.5"
- 3.) SINCE PISTON POSITION IS AT THE OPPOSITE END OF THE CYLINDER THE BUSHING STRESS WILL BE CONSIDERABLY REDUCED FROM THE BUSHING STRESSES COMPUTED FOR THE "FAIL-OPEN" VALVES.

FROM PREVIOUSLY DEVELOPED EQUATION: (SHEET 3)

$$P_B = R \left(\frac{L}{L_P} \right) + R$$

ASSUME $L_{CLOSED} = 51.5"$
 $L_{OPEN} = 36.5"$

ALTHOUGH EXACT POSITION IS UNDETERMINED

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CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-B3-018001-4

SHEET 6 OF 12

REVISION INDICATIONS

VALVE CEP-V-4A

STRESS CHECK FOR 820# TEST LOAD

$$M_{TURNION} = (38)(820) = 31160 \text{ in-lb}$$

$$R_{OPEN} = \frac{M_{TURNION}}{40} = 779 \#$$

$$R_{CLOSED} = \frac{M_{TURNION}}{25} = 1246 \#$$

VALVE OPEN:

$$\sigma_{BEND} = \frac{Mc}{I} = \left(\frac{26.5}{40} \right) \left(\frac{31160}{(.46)} \right) \left(\frac{1.75}{2} \right) = 39268 \text{ PSI}$$

$$\tau = \frac{R}{A} = \frac{779}{2.41} = 323 \text{ PSI}$$

$$\sigma_{OPERATING} = 5525 \text{ PSI (COMPUTER RUN)}$$

$$\sigma_{TOTAL} = \sigma_{OPERATING} + \sigma_{BEND} = 44793 \text{ PSI}$$

MAX PRINCIPAL STRESS:

$$\frac{44793}{2} + \sqrt{\left(\frac{44793}{2} \right)^2 + (323)^2} = 44795 < 86400$$

VALVE CLOSED:

- ROD STRESS OK -

$$\sigma_{BEND} = \frac{Mc}{I} = \left(\frac{11.5}{25} \right) \left(\frac{31160}{(.46)} \right) \left(\frac{1.75}{2} \right) = 27265 \text{ PSI}$$

$$\tau = \frac{R}{A} = \frac{1246}{2.41} = 517 \text{ PSI}$$

$$\sigma_{TOTAL} = 32790 \text{ PSI}$$

MAX PRINCIPAL STRESS:

$$\frac{32790}{2} + \sqrt{\left(\frac{32790}{2} \right)^2 + (517)^2} =$$

$$32795 < 86400$$

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12-14-83

CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-01B001-4

SHEET 7 OF 12

VALVE: CEP-V-4A (700# LOAD)DRIVE ROD END REACTIONS: $R_{OPEN} = 665\#$

$$\{L_{CLOSED} = 11.5\} R_{CLOSED} = \frac{700(36)}{(25)} = 1004\#$$

$$P_{B_{OPEN}} = 665 \left(\frac{26.5}{36.5} \right) + 665 = 1148\#$$

$$P_{B_{CLOSED}} = 1004 \left(\frac{11.5}{51.5} \right) + 1004 = 1228\#$$

BUSHING STRESS: $\frac{P_B}{\text{AREA (BEARING)}}$

OPEN POSITION: 553 PSICLOSED POSITION: 592 PSI O.K.820# TEST LOAD

$$R_{OPEN} = 779\#, R_{CLOSED} = 1246\#$$

$$P_{B_{OPEN}} = 779 \left(\frac{26.5}{36.5} \right) + 779 = 1345\#$$

$$P_{B_{CLOSED}} = 1246 \left(\frac{11.5}{51.5} \right) + 1246 = 1524\#$$

BUSHING STRESS: $\frac{P_B}{\text{AREA (BEARING)}}$

OPEN POSITION: 648 PSICLOSED POSITION: 735 PSI O.K.

REVISION INDICATIONS

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CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-018001-4SHEET 8 OF 12

REVISION INDICATIONS

VALVE: CSP-V-1

10" AIR CYLINDER

FAIL CLOSED

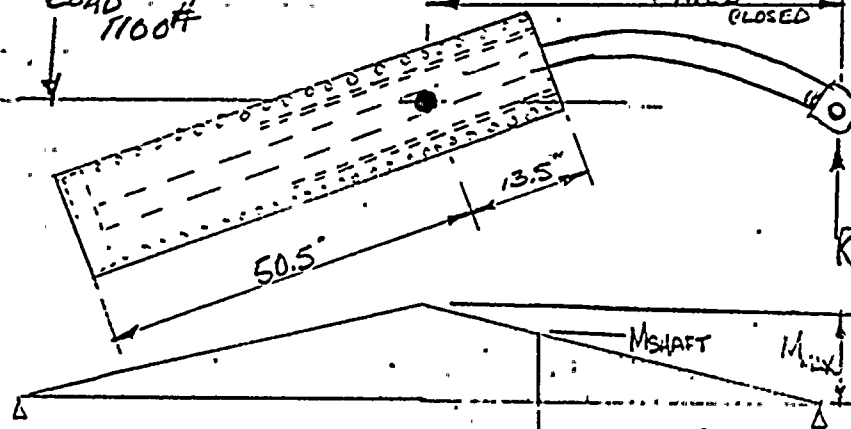
 $F_{ST2} = 1847 \text{ LB}$

(SEATING TORQUE)

LATERAL (TEST)
LOAD
1100#

40" OPEN

27.125" CLOSED



DRIVE ROD STRESS:

10" CYLINDER HAS SAME DIAMETER DRIVE ROD
AS 8" CYLINDER
$$\text{SPRING LOAD} = 2800 \text{# INITIAL}$$

$$4800 \text{# FINAL (OPEN)}$$

$$M_{\text{TRUNION}} = (50.5)(1100) = 55550 \text{ IN-LB}$$

VALVE OPEN:

AIR PRESSURE FORCE:

$$70 \text{ PSIG } (9.96 \text{ ID})^2 \frac{\pi}{4} = 5454 \text{# (OVERCOMES SPRING FINAL LOAD)}$$

$$R_{\text{OPEN}} = \frac{M_{\text{TRUNION}}}{40} = 1389 \text{#}$$

$$R_{\text{CLOSED}} = \frac{M_{\text{TRUNION}}}{27.125} = 2048 \text{#}$$

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12-19-93

CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-018001-4

SHEET 9 OF 12

REVISION INDICATIONS

DRIVE ROD STRESS: VALVE OPEN

$$\sigma_{BEND} = \frac{Mc}{I} = \left(\frac{26.5}{40} \right) \left(\frac{55550 \left(\frac{1.75}{2} \right)}{(.46)} \right) = 70004 \text{ PSI}$$

$$\sigma_{FST2} = \frac{F_{ST2}}{A} = \frac{1847}{2.41} = 766 \text{ PSI}$$

$$\tau = \frac{R_o}{A} = \frac{1389}{2.41} = 576 \text{ PSI}$$

$$\text{PRINCIPAL STRESS: } \frac{70770}{2} + \sqrt{\left(\frac{70770}{2} \right)^2 + (576)^2}$$

$$\sigma_{MAX} = 70775 \text{ PSI} < 86400 \text{ PSI}$$

VALVE CLOSED

$$\sigma_{BEND} = \frac{Mc}{I} = \left(\frac{13.625}{27.125} \right) \left(\frac{55550 \left(\frac{1.75}{2} \right)}{(.46)} \right) = 53176 \text{ PSI}$$

$$\sigma_{FST2} = 766 \text{ PSI}$$

$$\sigma_{SPRING} = \frac{2800}{2.41} = 1162 \text{ PSI}$$

$$\tau = \frac{R_o}{A} = \frac{2048}{2.41} = 850 \text{ PSI}$$

$$\text{PRINCIPAL STRESS: } \frac{55001}{2} + \sqrt{\left(\frac{55001}{2} \right)^2 + (849)^2}$$

$$\sigma_{MAX} = 55017 \text{ PSI} < 86400 \text{ PSI}$$

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12-14-83



CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-B3-018001-4SHEET 10 OF 12

REVISION INDICATIONS

VALVE: CSP-V-1

$$P_B = R \left(\frac{L}{L_P} \right) + R$$

ASSUME

$$L_{P_{CLOSED}} = 64"$$

$$L_{P_{OPEN}} = 49"$$

$$P_{B_{OPEN}} = 1389 \left(\frac{26.5}{49} \right) + 1388 = 2140 \text{ #}$$

$$P_{B_{CLOSED}} = 2048 \left(\frac{13.625}{64} \right) + 2046 = 2484 \text{ #}$$

$$\text{BUSHING STRESS: } \frac{P_B}{\text{AREA}_{(\text{BUSHING})}}$$

$$\text{OPEN POSITION: } \underline{1031 \text{ PSI}}$$

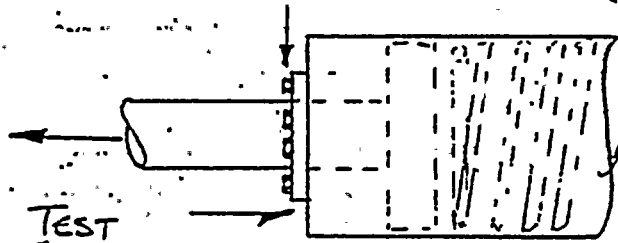
$$\text{CLOSED POSITION: } \underline{1196 \text{ PSI OK}}$$

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MJM

12-17-93

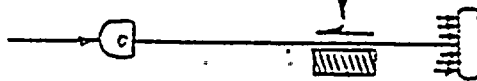
CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-018001SHEET 11 OF 12CAP SCREW STRESS:TEST
EXAMPLE8 - 1/4" MACHINE
SCREWS(ASSUME A-307 MATERIAL)
STRESS AREA = .0302 in²

CSP-V-5 - FAIL: OPEN VALVE: -

AIR PRESSURE (70PSIG) MOVES THE PISTON
OVERCOMING A SPRING FORCE: 350#/IN THROUGH
A 15" STROKE. DURING THE OPERABILITY TEST, END
LOAD OF 700# WAS APPLIED AND PISTON ACTUATION
WAS ATTEMPTED (PISTON DID NOT MOVE).

MAXIMUM PRESSURE = 3251# (FORCE)
N = P_{OPEN} = 5700# (SH-3)



ASSUME $\mu = .5$
HARD STEEL VS GREY

$F = \mu N$ MAX FRICTIONAL LOAD = 5700# (.5)
= 2850#
(@ BUSHING)

MAXIMUM AVAILABLE FORCE TO MOVE PISTON
= 3251# - 350# (PRELOAD) = 2901#

CAPSCREW LOAD: (ASSUME NO PRELOAD)

$$\frac{2901\#}{8} = 363\#/\text{BOLT}$$

CAPSCREWS LOADED IN PURE TENSION:

STRESS =

$$\frac{363\#}{.0302} = 12007\text{PSI} < 20\text{KSI (AISC 6th)}$$

REVISION INDICATIONS

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12-14-83

CALCULATION CONTINUATION SHEET

CALC NO. EQ-02-83-018001-4

SHEET 12 OF 12

REVISION INDICATIONS

DISCUSSION: PER THE RESULTS OF THE TESTING PERFORMED ON CSP-V-5 NO DAMAGE WAS INCURRED BY THE SEAL WITH RESPECT TO THE POSSIBILITY OF DAMAGE DURING SIESMIC/HYDRODYNAMIC LOADING, THESE VALVES ARE ALL SPRING LOADED IN THE FAIL SAFE MODE THEREFORE THE SEALS ARE NOT REQUIRED FOR THIS FUNCTION.

References

- 1) Analysis of Miller Air Cylinders QID 018001 Rev 0

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12-19-83



Specifications and Properties of

Specification No. (a)	Grade or Class	Min Tensile Strength, Psi	Hardness, Brinell	Other Requirements	Typical Applications
-----------------------	----------------	---------------------------	-------------------	--------------------	----------------------

Gray Iron Castings

ASTM A125-73	A B C	21,000 31,000 41,000		Composition, %			Stock valves, flanges, and pipe fittings, and castings not requiring critical tensile test evaluation.	
				P Max 0.75	S Max 0.15			
				1.2 in. dia. x 12 in. transverse test is optional.				
ASTM A48-76	20 (b) 25 (b)	20,000 (c) 25,000 (c)		Test bar size shall be related in cooling rate to the critical section of the casting and so specified. At least two test bars shall be cast and prepared for each casting lot, the lot size being designated. Test bars shall be cast in dry silica sand molds similar to that in which the castings are poured. Tension test shall be under true axial loading. Hardness, chemical composition, microstructure, pressure tightness, radiographic soundness, dimension, surface finish, etc., can be established as requirements upon written agreement between manufacturer and purchaser.			Small or thin-sectioned castings requiring good appearance, good machinability, and close dimensions.	
	30 (b) 35 (b)	30,000 (c) 35,000 (c)					General machinery, municipal and water works, light compressors.	
ANSI G25.1	40 (b) 45 (b)	40,000 (c) 45,000 (c)					Machine tools, medium gear blanks, heavy compressors.	
QQ-1-652c	50 (b) 55 (b) 60 (b)	50,000 (c) 55,000 (c) 60,000 (c)					Dies, crankshafts, high pressure cylinders, heavy-duty machine tool parts, large gears, press frames.	
ASTM A125-77 (d)	G1800		187 Max (e)	Total Carbon, %	Microstructure		For machinability where higher strength is not necessary.	
	G2500		170-229 (e)		Ferritic-pearlitic			
	G2500a		170-229 (e)	3.40 min mandatory	"A" graphite size 2-4, 15% max ferrite		Small cylinder blocks and heads, pistons, clutch plates, pump bodies, gear boxes, housings, light-duty brake drums.	
	G3000		187-241 (e)		Pearlitic		Brake drums and clutch plates to minimize heat checking.	
	G3500		207-255 (e)		Pearlitic		Cylinder blocks, heads, liners, fly wheels, pistons, medium-duty brake drums, clutch plates.	
	G3500b		207-255 (e)	3.40 min mandatory	"A" graphite size 3-5, 5% max ferrite or carbide		Truck cylinder blocks and heads, heavy flywheels and transmission cases, differential carriers.	
	G3500c		207-255 (e)	3.50 min mandatory	"A" graphite size 3-5, 5% max ferrite or carbide		Brake drums and clutch plates for heavy service requiring heat resistance and higher strength.	
	G4000		217-269 (e)		Pearlitic		Extra-heavy-duty service brake drums.	
ASTM A278-75 ASME SA278	40 (f) 50 60 70 (g) 80 (g)	40,000 (h) 50,000 (h) 60,000 (h) 70,000 (h) 80,000 (h)		Carbon Equivalent Max	P Max	S Max	Castings and test bars must be stress relieved by prescribed methods.	Pressure-containing parts for use to 650 F — valve bodies, paper-mill drier rolls, chemical process equipment, pressure vessel castings.
				3.8 [CE = %C ÷ 0.3 (%Si ÷ %P)]	0.25	0.12		
ASTM A319-71	I	Low strength (i)	Maximum hardness at casting locations to be machined shall be agreed on by manufacturer and purchaser	Carbon Equivalent	Carbon Min	When chromium is present as an alloying element, each class shall be subdivided as: (j)		Nonpressure-containing parts at elevated temperatures — stoker and fire box parts, grate bars, process furnace parts, ingot molds, glass molds, caustic pots, metal melting pots. Class I — superior thermal shock resistance, low strength; Class II — average thermal shock resistance; Class III — high strength at temperature.
	II	Above 30,000 may be expected (i)		3.81-4.40	3.50			
	III	As high as 40,000 may be expected		3.51-4.10	3.20	Type	Cr	
				3.20-3.80	2.80	A B C D	0.20-0.40 0.41-0.65 0.66-0.95 0.96-1.20	

High Alloy Gray and White Iron Castings

MIL-G-858B	1	25,000.	120-180	Composition, %								Resists corrosion, scaling, pitting, etc. and growth. For use at elevated temperatures, galleys range tops to resist acid, caustic, and salt solutions. (For galleys range tops, maximums shall be 0.20 S, 0.70 P.)	
					TC	Si	Mn	Ni	Cr	Cu	S		Other
				Min	2.60	1.25	1.0	13.5	1.8	5.5			
				Max	3.00	2.20	1.5	17.5	3.5	7.5	0.10	0.20 P	
	2	25,000	120-180	Min	2.60	1.25	0.80	18.0	1.75				
Max				3.00	2.20	1.30	22.0	3.50	0.50	0.10	0.20P		

Physical and mechanical properties of cast irons

Type, class	PHYSICAL PROPERTIES					MECHANICAL PROPERTIES		
	Density, lb/cu in. (kg/cu m)	Coeff of ther exp (32-212 F, 273- 373 K), 10 ⁻⁶ in./ in./F (10 ⁻⁶ m/ m/K)	Elec res (65 F, 293 K), microhm-cm (10 ⁻³ ohm-m)	Ther cond (212 F, 373 K) Btu·h/hr·sq ft·F (W/m·K)	Modulus of elasticity, 10 ⁶ psi (10 ⁴ MPa)	Ult ten str, 1000 psi (MPa)	Ten yld str (62 ¹ ·psi), 1000 psi (MPa)	
Gray irons								
Standard								
20	0.25 (6920)	6 (10.8)	90 (9)	28-30 (48.5-51.9)	9.6-14 (6.6-9.7)	20-25 (138-172)	—	—
25	0.25 (6920)	6 (10.8)	110 (11)	28-30 (48.5-51.9)	11.5-14.8 (7.9-10.2)	25-30 (172-207)	—	—
30	0.254 (7031)	6 (10.8)	100 (10)	28-30 (48.5-51.9)	13-16.4 (9-11.3)	30-35 (207-241)	—	—
35	0.26 (7197)	6 (10.8)	100 (10)	28-30 (48.5-51.9)	14.5-17.2 (10-11.9)	35-40 (241-276)	—	—
40	0.262 (7252)	6 (10.8)	80 (8)	28-30 (48.5-51.9)	16-20 (11-13.8)	40-48 (276-331)	—	0.7
45	0.26 (7197)	6 (10.8)	80 (8)	28-30 (48.5-51.9)	18 (12.4)	45-52 (310-359)	—	—
50	0.269 (7446)	6 (10.8)	80 (8)	28-30 (48.5-51.9)	18.8-22.8 (13-15.7)	50-57 (345-393)	—	—
60	0.27 (7474)	6 (10.8)	70(7)	28-30 (48.5-51.9)	20.4-23.5 (14-16.2)	60-66 (414-455)	—	—
70	0.272 (7529)	6 (10.8)	—	—	20 (13.8)	70 (483)	—	—
Ni alloyed								
30	0.257 (7114)	6.5-6.8 (11.7-12.2)	—	25-28 (43.3-48.5)	14 (9.7)	30 (207) min	—	—
40	0.260 (7197)	6.5-6.8 (11.7-12.2)	—	25-28 (43.3-48.5)	16 (11)	40 (276)	—	—
50	0.264 (7308)	6.5-6.8 (11.7-12.2)	—	25-28 (43.3-48.5)	18 (12.4)	50 (345)	—	—
60	0.268 (7418)	6.5-6.8 (11.7-12.2)	—	25-28 (43.3-48.5)	20 (13.8)	60 (414)	—	—
70	0.268 (7418)	6.5-6.8 (11.7-12.2)	—	25-28 (43.3-48.5)	22 (15.2)	70 (483)	—	—
80	0.268 (7418)	6.5-6.8 (11.7-12.2)	—	25-28 (43.3-48.5)	24 (16.5)	80 (552)	—	—
Ductile irons								
Standard								
60-40-18	0.257 (7114)	6.6 (11.9) ^a	66 (6.6)	20 (34.6)	23-25 (15.9-17.2)	60-80 (414-552)	40-55 (276-379)	18-30
80-55-06	0.257 (7114)	6.1 (11) ^a	68 (6.8)	18 (31.2)	23-25 (15.9-17.2)	80-100 (552-690)	55-75 (379-517)	6-10
100-70-03	0.257 (7114)	6.0 (10.8) ^a	68 (6.8)	—	23 (15.9)	100-120 (690-827)	70-90 (483-621)	3-10
120-90-02	0.257 (7114)	6.5 (11.7) ^a	—	—	23 (15.9)	120-175 (827-1207)	90-150 (621-1034)	2-7
Ni-Resist^b								
D-2	0.268 (7418)	9.8 (17.6)	102 (10.2)	7.8 (13.5)	16.5-18.5 (11.4-12.8)	55-69 (379-476)	32-36 (221-248)	8-20
D-2B	0.27 (7474)	10.4 (18.7) ^a	—	—	16.5-19 (11.4-13.1)	58-70 (400-483)	33-37 (228-255)	7-15
D-2C	0.268 (7418)	10.2 (18.4) ^a	—	—	15 (10.3)	55-65 (379-448)	30-35 (207-241)	20-40
D-3	0.27 (7474)	5.5 (9.9)	—	—	13.5-14.5 (9.3-10)	55-67 (379-462)	33-37 (228-255)	7-18
D-3A	0.27 (7474)	—	—	—	16-18.5 (11-12.8)	55-65 (379-448)	32-39 (221-269)	15-18
D-4	0.27 (7474)	7.3 (13.1)	—	—	13 (9)	60-72 (414-496)	38-44 (262-303)	15-40
D-5	0.278 (7695)	2.8 (5)	—	—	16-20 (11-13.8)	55-60 (379-414)	30-35 (207-241)	20-40
D-5B	0.279 (7723)	—	—	—	16-17.5 (11-12.1)	55-65 (379-448)	35-42 (241-290)	5-10
Malleable irons								
Ferritic								
32510	0.261 (7224)	5.9 (10.6)	27-34 (2.7-3.4)	29.5 (51.1) ¹	25 (17.2)	50-58 (345-400)	32.5 (224)	10-18
35018	0.261 (7224)	5.9 (10.6)	27-34 (2.7-3.4)	29.5 (51.1) ¹	25 (17.2)	53-60 (365-414)	35-40 (241-276)	18-30
Pearlitic								
43010	—	—	—	—	—	60 (414)	43 (296)	10
45007	—	—	—	—	26 (17.9)	65 (448)	45 (310)	7
45010	—	—	37-41 (3.7-4.1)	—	26 (17.9)	65 (448)	45 (310)	10
48004	—	—	—	—	—	70 (483)	48 (331)	4
48005	—	—	—	—	—	70 (483)	48 (331)	5
50007	0.266 (7363)	7.5-7.6 (13.5-13.7) ^a	36.7-41.1 (3.7-4.1)	29.5 (51.1) ¹	26 (17.9)	75 (517)	50 (345)	7
53004	—	—	—	—	—	80 (552)	53 (365)	4
60003	0.266 (7363)	7.5-7.6 (13.5-13.7)	36.7-41.1 (3.7-4.1)	29.5 (51.1) ¹	27 (18.6)	80 (552)	60 (414)	3
70002	—	—	—	—	—	90 (621)	70 (483)	2
80002	—	—	—	—	—	95 (655)	80 (552)	2
White & alloy irons								
Unalloyed	0.275 (7612) min	12.6 (22.7) ^a	53 (5.3)	—	24-28 (16.5-19.3)	20-50 (138-345)	—	—
High silicon	0.252 (6975) min	6.9-7.3 (12.4-13.1) ^a	—	—	—	13-18 (90-124)	—	—
High chromium	0.264 (7308) min	5.2-5.5 (9.4-9.9) ^a	—	—	—	30-90 (207-621)	—	—
Medium silicon	0.245 (6782) min	6.0 (10.8) ^a	—	—	—	25-45 (172-310)	—	—
Ni-Cr-Si	0.265 (7335) min	7.0-9.0 (12.6-16.2) ^a	150-170 (15-17)	—	—	20-45 (138-310)	—	—
High aluminum	0.200 (5536) min	8.5 (15.3) ^a	240 (24)	—	—	34-90 (234-621)	—	—
Ni-Resist								
1	0.264 (7308)	10.4 (18.7) ^a	130-170 (13-17)	23 (39.8) ^a	12-14 (8.3-9.7)	25-30 (172-207)	—	—
2	0.264 (7308)	9.6 (17.3) ^a	130-170 (13-17)	23 (39.8) ^a	15.6 (10.8)	25-30 (172-207)	—	—
2B	0.268 (7418)	9.6 (17.3)	130-170 (13-17)	—	15-16.5 (10.3-11.4)	30-35 (207-241)	—	—
3	0.255 (7418)	6.9 (12.4) ^a	—	—	15-15.5 (10.3-10.7)	25-35 (172-241)	—	—
4	0.268 (7418)	8.1 (14.6)	—	—	15 (10.3)	25-30 (172-207)	—	—
5	0.268 (7418)	2.8 (5) ^a	—	22.8 (39.5) ^a	10.5 (7.2)	20-25 (138-172)	—	—
Ni-Hard								
1 sand cast	0.275 (7612) min	4.5-5.0 (8.1-9) ^a	80 (8)	—	24-26 (16.5-17.9)	40-50 (276-345)	40-50 (276-345)	—
1 chill cast	0.275 (7612) min	4.5-5.0 (8.1-9) ^a	80 (8)	—	24-26 (16.5-17.9)	50-60 (345-414)	50-60 (345-414)	—
2 sand cast	0.275 (7612) min	4.5-5.0 (8.1-9) ^a	80 (8)	—	24-26 (16.5-17.9)	45-55 (310-379)	45-55 (310-379)	—
2 chill cast	0.275 (7612) min	4.5-5.0 (8.1-9) ^a	80 (8)	—	16-18 (11-12.8)	60-70 (414-483)	60-70 (414-483)	—
Aluminite ^c	—	—	—	—	—	60-80 (414-552)	—	2-4

Specimen	Tensile comp strength 1000 psi (MPa)	Tensile strength 1000 psi (MPa)		Shear str. 1000 psi (MPa)	Impact strength ft-lb (J)		Tensile 1230	Charpy
		Unnotched	Notched		Unnotched Charpy	Unnotched Charpy ¹		
140-187	80-105 (552-724)	9.5-10 (66-70)	9.5 (66)	32 (221)	—	55 (75)	21 (28)	—
170-229	95-110 (655-758)	12-15 (83-103)	—	32-45 (221-310)	—	55 (75)	22 (30)	—
170-241	109-115 (752-793)	13.7-15.5 (94-107)	13.5 (93)	44 (303)	—	60 (81)	23 (31)	—
187-269	125 (862)	16-17.5 (110-121)	—	43 (296)	—	60 (81)	25 (34)	—
107-269	143-143 (965-986)	17.5-19.5 (121-134)	17.5 (121)	57 (393)	—	70 (95)	31 (42)	—
217-269	147 (1014)	21.5-25.5 (148-176)	—	—	—	—	36 (49)	—
215-260	155-164 (1034-1131)	24.5-27.5 (169-190)	21.5 (148)	59 (407)	—	80 (108)	65 (88)	—
230-290	170-187 (1172-1289)	24.5-29.5 (169-203)	—	72 (496)	—	115 (156) ^a	75 (102)	—
—	200 (1379)	29.5-31.5 (203-217)	25.5 (176)	85 (586)	—	—	120 (163)	—
200	110 (758) min	15 (103)	12 (83)	—	—	—	26 (35)	—
230	130 (896)	19 (131)	14 (97)	—	—	—	35 (47)	—
260	145 (1000)	23 (159)	16 (110)	—	—	—	43 (58)	—
290	165 (1138)	27 (186)	18 (124)	—	—	—	52 (71)	—
320	180 (1241)	31 (214)	20 (138)	—	—	—	61 (83)	—
350	200 (1379)	35 (241)	22 (152)	—	—	—	70 (95)	—
149-187	56 (386) ^a	30.5 (210)	18-23 (124-159)	57 (393)	75-115 (102-156)	—	>120 (>163)	10-15 (14-20)
179-248	88 (607) ^a	39-40 (269-276)	21-24 (145-165)	73 (503)	15-65 (20-88)	—	>120 (>163)	2-5 (2.7-6.8)
217-269	134 (924) ^a	—	—	—	35-50 (47-68)	—	—	2-6 (2.7-8.1)
240-300	180-200 (1241-1379)	49 (338)	30 (207)	—	25-40 (34-54)	—	—	2-6 (2.7-8.1)
140-200	—	30 (207)	20 (138)	—	26 (35)	—	—	12 (16)
150-210	—	—	—	—	—	—	—	10 (14)
130-170	—	—	—	—	—	—	—	28 (38)
140-200	—	—	—	—	—	—	—	7 (9.5)
130-190	—	—	—	—	—	—	—	14 (19)
170-240	—	—	—	—	—	—	—	—
130-180	—	—	—	—	—	—	—	17 (23)
140-190	—	—	—	—	—	—	—	6 (8.1)
110-156	208 (1434)	28 (193)	—	45-48 (310-331)	50-60 (68-81)	70-90 (95-122)	—	14-17 (19-23)
110-156	216-219 (1489-1510)	31 (214)	—	45-48 (310-331)	—	70-90 (95-122)	—	16.5 (22)
163-207	—	—	—	—	—	—	—	—
163-217	—	—	—	—	—	—	—	—
163-207	—	—	—	—	—	—	—	9 (12)
163-228	—	—	—	—	—	—	—	—
179-228	—	—	—	—	—	—	—	6 (8.1)
179-228	197-290 (1358-2000)	37 (255)	30 (207)	—	—	22-35 (30-47)	—	—
197-241	—	—	—	—	—	—	—	4 (5.4)
197-255	197-290 (1358-2000)	39 (269)	—	—	—	22-35 (30-47)	—	—
241-285	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
300-575	220 (1517)	—	—	—	—	3.5-10 (4.7-13.6)	—	—
480-520	—	—	—	—	—	2-4 (2.7-5.4) ^a	—	—
290-400	100 (690) min	—	—	—	—	20-35 (27-47) ^a	—	—
170-250	90-150 (621-1034)	—	—	—	—	15-23 (20-31) ^a	—	—
80-150	70-100 (483-690)	—	—	—	—	110-210 (149-284) ^a	—	—
180-350	—	—	—	—	—	180-350 (244-475) ^a	—	—
130-170	100-120 (690-827)	12 (83)	—	—	—	—	100 (136)	—
125-170	100-120 (690-827)	12 (83)	—	—	—	—	100 (136)	—
170-250	130-160 (896-1103)	18 (124)	—	—	—	—	60 (81)	—
20-165	—	13.5 (93)	—	—	—	—	100 (136)	—
20-210	—	9 (62)	—	—	—	—	80 (108)	—
100-125	80-100 552-690	9.9 (68)	—	—	—	—	150 (203)	—
550 ^a	—	—	—	—	—	—	20-30 (27-41)	—
600 ^a	—	—	—	—	—	—	25-40 (34-54)	—
525 ^a	—	—	—	—	—	—	25-35 (34-47)	—
575 ^a	—	—	—	—	—	—	35-55 (47-75)	—
450-525	—	—	—	—	—	—	10-150 (10-244)	—

UN comp str.	Fatigue strength 1000 psi (MPa)	Shear str. 1000 psi (MPa)		Impact strength ft-lb (J)		Unnotched Charpy	Unnotched Charpy ¹	1730
		Unnotched	Notched	Unnotched	Unnotched			
140-187	80-105 (552-724)	9.5-10 (66-70)	9.5 (66)	32 (221)	55 (75)	21 (28)		
170-229	95-110 (655-758)	12-15 (83-103)		32-45 (221-310)	55 (75)	22 (30)		
170-241	109-115 (752-793)	13.7-15.5 (94-107)	13.5 (93)	44 (303)	60 (81)	23 (31)		
17-269	125 (862)	16-17.5 (110-121)		43 (296)	60 (81)	25 (34)		
17-269	145-143 (955-986)	17.5-19.5 (121-134)	17.5 (121)	57 (393)	70 (95)	31 (42)		
217-269	147 (1014)	21.5-25.5 (148-176)				36 (49)		
215-260	159-164 (1034-1131)	24.5-27.5 (169-190)	21.5 (148)	59 (407)	80 (108)	65 (88)		
230-290	170-187 (1172-1289)	24.5-29.5 (169-203)		72 (496)	115 (156)*	75 (102)		
	200 (1379)	29.5-31.5 (203-217)	25.5 (176)	85 (586)		120 (163)		
200	110 (758) min	15 (103)	12 (83)			26 (35)		
230	130 (896)	19 (131)	14 (97)			35 (47)		
260	145 (1000)	23 (159)	16 (110)			43 (58)		
290	165 (1138)	27 (186)	18 (124)			52 (71)		
320	180 (1241)	31 (214)	20 (138)			61 (83)		
350	200 (1379)	35 (241)	22 (152)			70 (95)		
149-187	56 (386)*	30.5 (210)	18-23 (124-159)	57 (393)	75-115 (102-156)		>120 (>163)	10-15 (14-20)
179-248	88 (607)*	39-40 (269-276)	21-24 (145-165)	73 (503)	15-65 (20-88)		>120 (>163)	2-5 (2.7-6.8)
217-269	134 (924)*				35-50 (47-68)			2-6 (2.7-8.1)
240-300	180-200 (1241-1379)	49 (338)	30 (207)		25-40 (34-54)			2-6 (2.7-8.1)
140-200		30 (207)	20 (138)		26 (35)			12 (16)
150-210								10 (14)
130-170								28 (38)
140-200								7 (9.5)
130-190								14 (19)
170-240								
130-180								17 (23)
140-190								6 (8.1)
110-156	208 (1434)	28 (193)		45-48 (310-331)	50-60 (68-81)	70-90 (95-122)		14-17 (19-23)
110-156	216-219 (1489-1510)	31 (214)		45-48 (310-331)		70-90 (95-122)		16.5 (22)
163-207								
163-217								
163-207								9 (12)
163-228								
179-228								6 (8.1)
179-228	197-290 (1358-2000)	37 (255)	30 (207)			22-35 (30-47)		
197-241								4 (5.4)
197-255	197-290 (1358-2000)	39 (269)				22-35 (30-47)		
241-285								
300-575	220 (1517)					3.5-10 (4.7-13.6)		
480-520						2-4 (2.7-5.4)*		
290-400	100 (690) min					20-35 (27-47)*		
170-250	90-150 (621-1034)					15-23 (20-31)*		
80-150	70-100 (483-690)					110-210 (149-284)*		

The following two test reports are confidential information and property of B.I.F.:

1. "Dynamic Torque and Head Loss Tests of Cast Iron Stream-line Disc Versus Fabricated Flat Plate Disc" 5/13/75.
2. "Hydrodynamic and Head Loss Test of 12" - 150 lb Butterfly Valve with Directly Connected Short Radius Elbow Upstream." May and June 1980.

WPPSS has a copy in Equipment Qualification files for review in regards to WNP-2 valve qualification.



CODE : PROJECT ENGINEERING DIRECTIVE														
2	1	1215 - B 1-X 087												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
DATE		018/09/83												
X		16	17	X	18	19	X	20	21					

REASON FOR P. E. D. :
TO IMPLEMENT COMMITMENTS TO
NRC THE STRUCTURAL MODIFICATIONS
DESCRIBED BELOW SHALL BE MADE
TO VALVES CSP-V-1, 2, 3, 4, 5, 6 AND
CSP-V-9 ALSO CEP-V-1A, 2A, 3A AND
CEP-V-4A:

INFORMATION
COPIES B. W. L. H. M.
KIRKSTON

SHEET 1 OF 10

REFERENCES

SUBJECT	STRUCT. MODIFICATION TO FORCE MAIN	VALU
LOCATION	R. B	
ENG. SYSTEM	CSP & CEP.	
SU SYSTEM	23.0	
QUALITY CLASS	I	

ORIGINATING LTR WPBR-F-83-457
DOCUMENTS LTR WPBR-F-83-511

"FIELD WORK REQUIRED"

DESCRIPTION OF WORK: 1) THE CONTRACTOR SHALL REPLACE THE FOUR (4) EXISTING ASTM A307 STUD BOLTS USED TO SECURE THE OPERATOR ASSEMBLY ON TO THE VALVE'S OPERATOR ASSEMBLY SUPPORT POSTS, (VALVE EARS) WITH STUD BOLTS CONFORMING TO ASTM A325 OR ~~ASTM A325~~ ² APPROVED EQUAL

2) THE CONTRACTOR ^{SHALL} MODIFY (ADD BRACING) TO THE OPERATOR ASSEMBLY SUPPORT POSTS AS SHOWN ON THE ATTACHED SHEETS.

NOTES

1. ITEMS 1 & 2 ABOVE ARE FOR VALVES CSP-V-1, 2, 3, 4, 5, 6 & CSP-V-9
CEP-V-1A, 2A, 3A & CEP-V-4A
2. FIELD WORK OUTLINED UNDER ITEM 2 ABOVE SHALL BE PERFORMED IN
ACCORDANCE WITH OWNERS ASME SECTION XI PROGRAM.

Received by George C. Shinn 8/5/83

1. THIS PED REVISES DIRECTION
PREVIOUSLY PROVIDED BY MA
THE FOLLOWING PED(s): _____

2. THIS PED VOIDS DIRECTION
PREVIOUSLY PROVIDED BY AMA
THE FOLLOWING PED(s): _____

THIS PED WORK SHOULD BE COORDINATED WITH KNOWN OTHER WORK UNDER THE FOLLOWING PED'S: NH

4: THIS PED DEPENDS ON THE PRIOR INSTALLATION OF THE FOLLOWING PED'S: N/A

REVISE:

NONE _____
DRAWINGS _____
SPECIFICATION _____

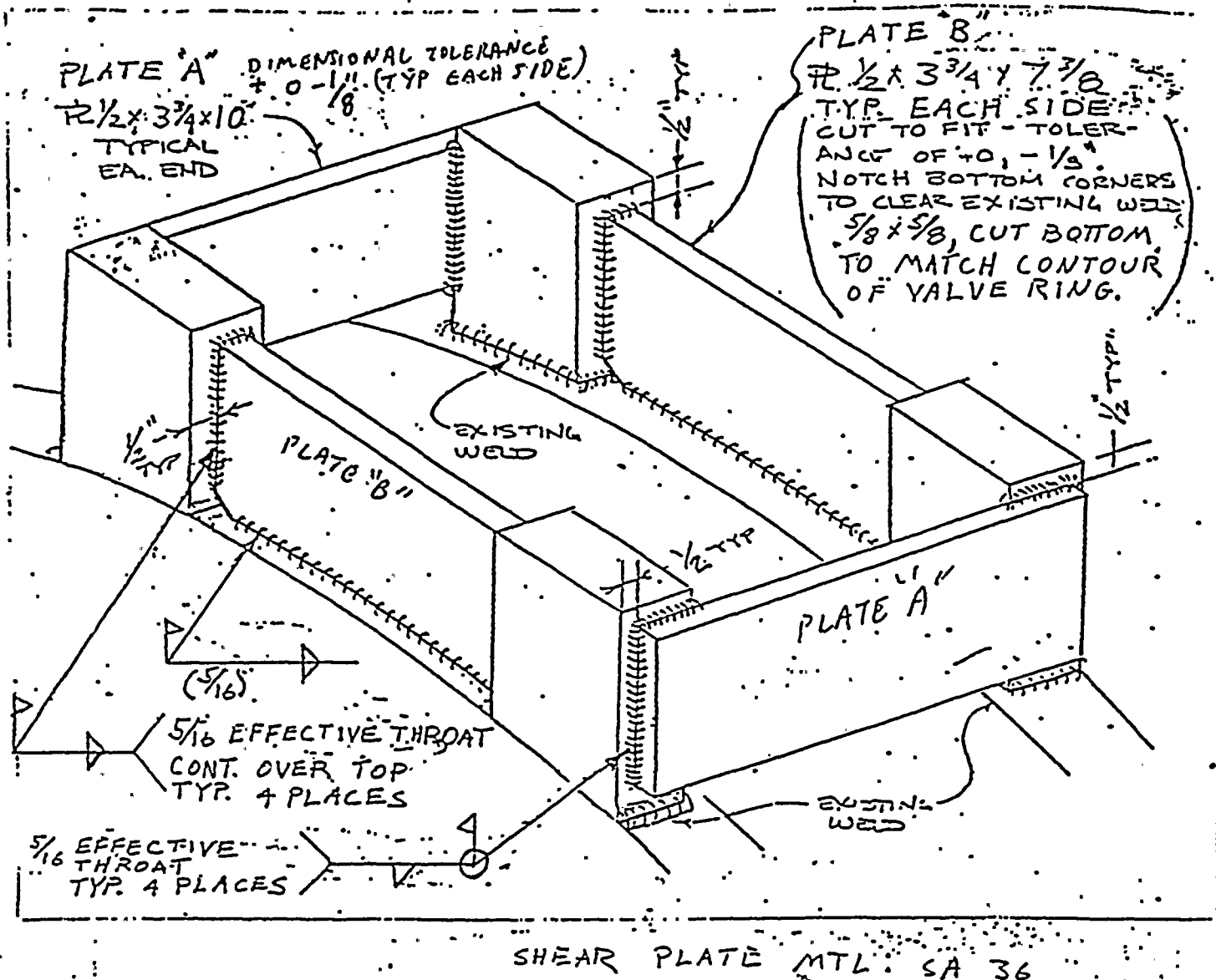
APPROVALS:

DISCIPLINE ENGINEER
K. C. B. M.
GROUP SUPERVISOR
R. L. C. B. M.
PROJECT ENGINEER

8/4/82
DATE
8/17/82
DATE
9.2.83
DATE

SECTION

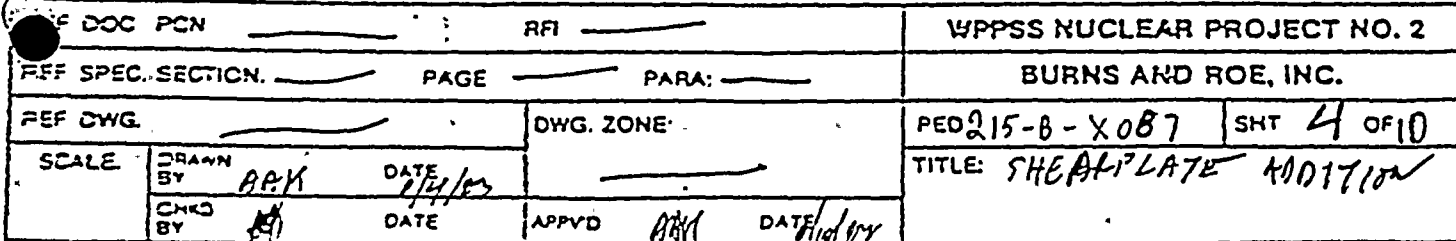
[illegible]

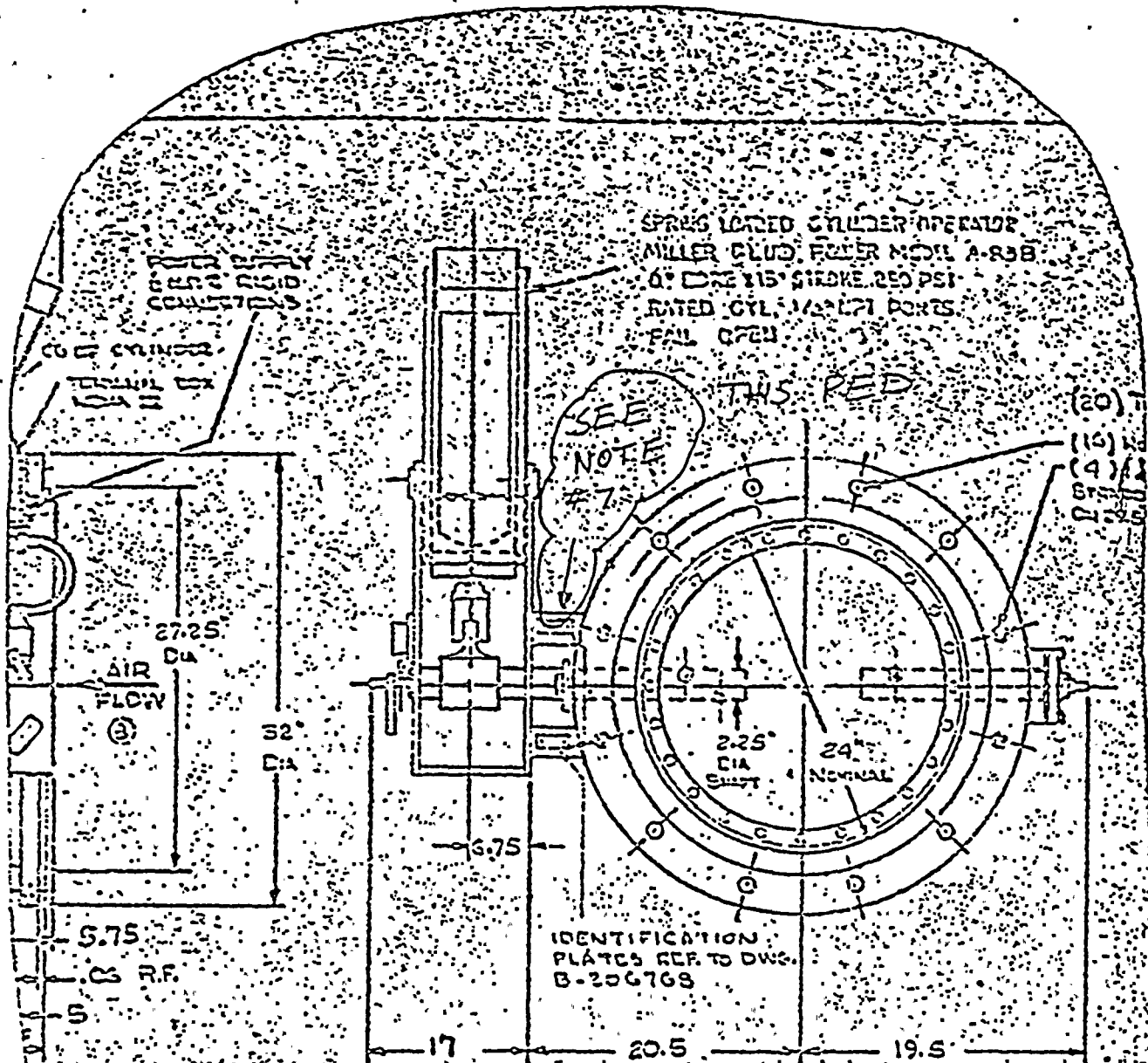


NOTE TO CONTRACTOR:

ATTACH PLATES A" & B" TO THE VALVE POSTS AS SHOWN.
 THIS DETAIL APPLIES TO VALVES CSP-V-1&2 AND
 CEP-V-1A & 2A. ALL WELD METAL E 7018 PREHEAT TO 200°F MIN
 $1/2$ " MAX FILLET. EXEMPTED FROM POST WELD HEAT TREATMENT
 PER ASME III NC 4622.7
 TO BE REPAIRED UNDER ASME SECTION II GUIDELINES

REF DOC PCN	RFI	WPPSS NUCLEAR PROJECT NO. 2	
REF SPEC SECTION	PAGE	BURNS AND ROE, INC.	
REF DWG	DWG ZONE	PED 215-B-X087	SHT 3 OF 10.
SCALE	DRAWN BY	TITLE. SHEAR PLATE	
	DATE	ADDITION	
BY	DATE	APPVD	DATE





SPRING LOADED CYLINDER OPERATOR
 MILLER CLUD. FILER MODEL A-83B
 6" DIA 15" STROKE 250 PSI
 RATED CYL. 1/2" LPT PORTS
 FAIL OPEN

SEE
 NOTE
 #7

THIS PED

(20)
 (16)
 (4)
 87
 0.25

IDENTIFICATION
 PLATES REF TO DWG.
 B-206768

THIS PED

7. SEE PED 215-B-X087 FOR
 DETAIL OF SHEAR PLATES
 ON OPERATOR SUPPORTS.

6. VALVE TO BE DESIGNED

REF. DOC: PCN		RFI		WPPSS NUCLEAR PROJECT NO. 2	
REF SPEC. SECTION:		PAGE:		BURNS AND ROE, INC.	
REF DWG: 68-00-0010		DWG. ZONE:		PED215-B-X087 SHT. 5 OF 10	
SCALE:	DRAWN BY: JCF	DATE: 8/4/80	TITLE: NOTE		
CHKD BY: ARV	DATE: 8/10/80	APPVD: AMM	DATE: 8/10/80	ADDITION	

19.6

THIS
RED

7. SEE PED 215-B-X087 FOR DETAIL
OF SHEAR PLATES ON OPERATOR
SUPPORT POSTS.

6. VALVES TO BE DESIGNED, FABRICATED, TESTED
AND STAMPED IN ACCORDANCE WITH THE
REQUIREMENTS OF ASME BOILER AND
PRESSURE VESSEL CODE, SECTION III,
SUBSECTION NC FOR CLASS 2 NUCLEAR COMPONENTS.

5. FLOW DIRECTION IS AS SHOWN, HOWEVER
FLOW IS ALLOWED IN EITHER DIRECTION.

4. TOTAL WEIGHT = 1473 LBS

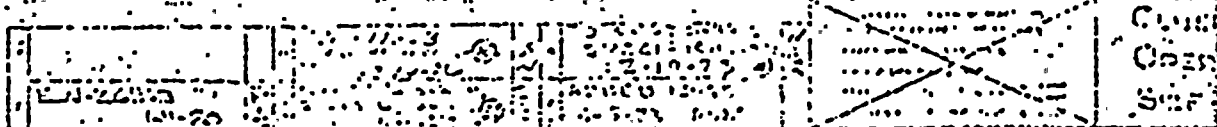
3. ASSEMBLED VALVE SHALL BE HYDROSTATICALLY
TESTED IN ACCORDANCE WITH GFM-305-HT-3

2. ASSEMBLED VALVE SHALL BE LEAK AND
PERFORMANCE TESTED IN ACCORDANCE WITH SP-305-3

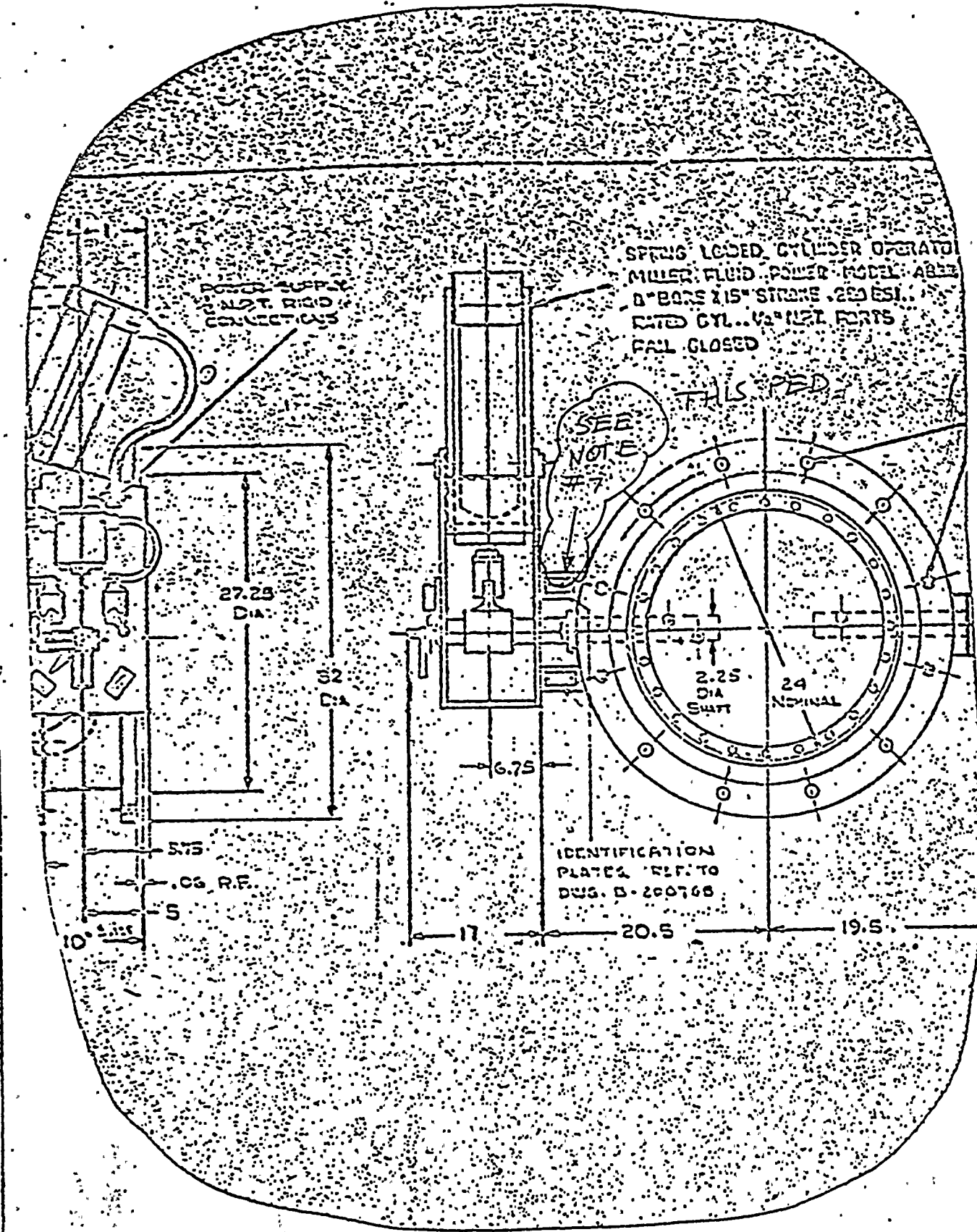
1. WALL THICKNESS TESTS SHALL BE IN ACCORDANCE
WITH D-206000

NOTES: UNLESS OTHERWISE SPECIFIED

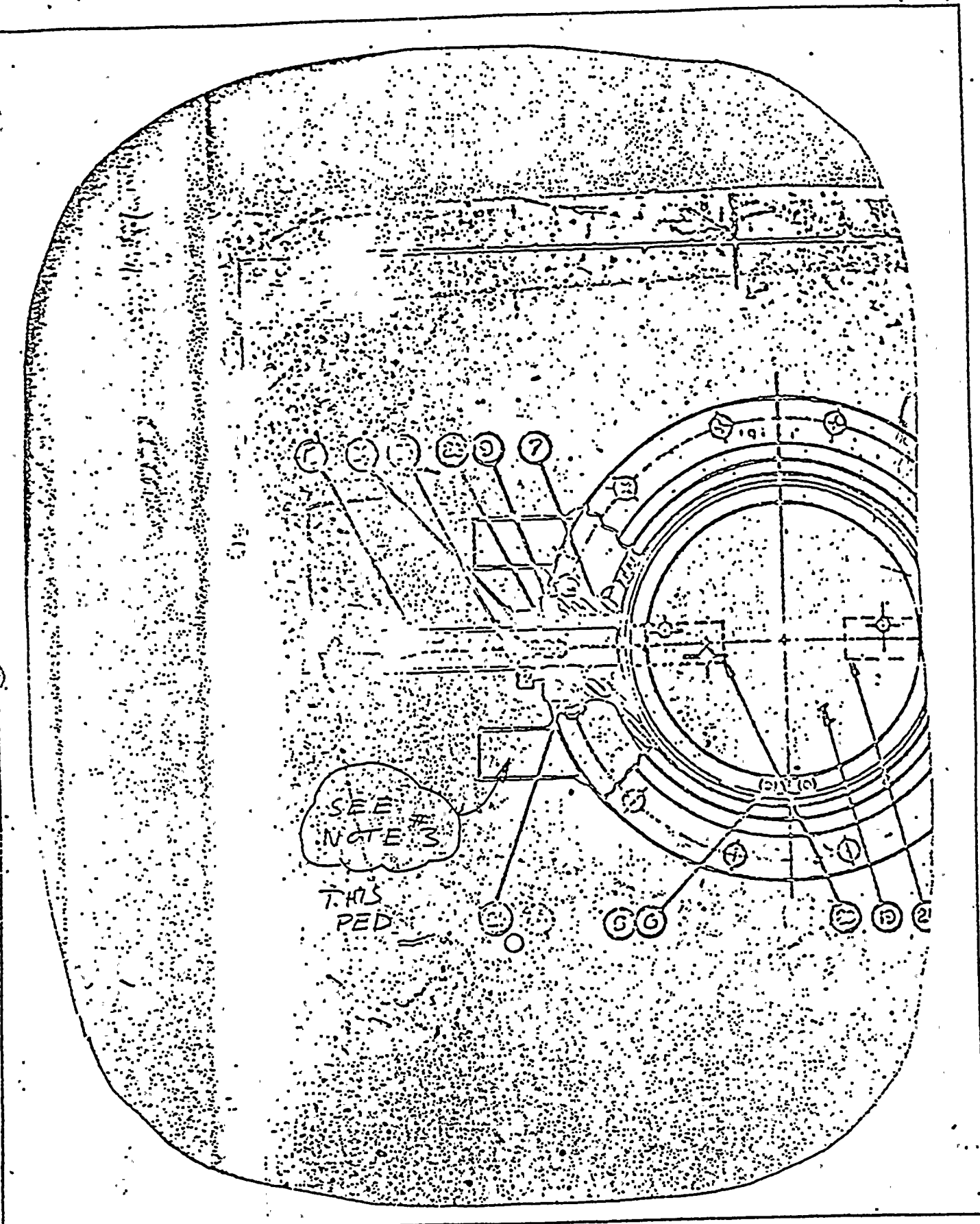
INFO



REF. DOC.: PCN		RFI		WPPSS NUCLEAR PROJECT NO. 2	
REF SPEC. SECTION:		PAGE:		BURNS AND ROE, INC.	
REF DWG.: 68-00-0009		DWG. ZONE:		PED 215-B-X087 SHT. 6 OF 10	
SCALE:	DRAWN BY: JCF	DATE: 8/5/83	TITLE: NOTE		
CHKD BY: ARK	DATE: 8/10/83	APPVD: ARK	DATE: 8/10/83	ADDITION	



REF. DOC: PCN		RFI		WPPSS NUCLEAR PROJECT NO. 2	
REF SPEC. SECTION:		PAGE:		BURNS AND ROE, INC.	
REF DWG: 68-00-0009		DWG. ZONE:		PED 215-B-X087 SHT. 7 OF 10	
SCALE:	DRAWN BY: ACF	DATE: 8/5/68	TITLE: NOTE		
CHKD BY: ABM	DATE: 8/10/67	APPVD: ABM	DATE: 8/10/67	ADDITION	



REF. DOC.: PCN		RFI		WFPSS NUCLEAR PROJECT NO. 2	
REF SPEC. SECTION:		PAGE:		BURNS AND ROE, INC.	
REF DWG. 68-00-0006		DWG. ZONE:		PED 215-B-X087 SHT. 8 OF 10	
SCALE:		DRAWN BY: JCF		DATE: 8/5/67	
CHKD BY: AMK		DATE: 8/16/67		APPROV: AMK	
				TITLE: NOTE	
				ADDITION	

THIS
-PED

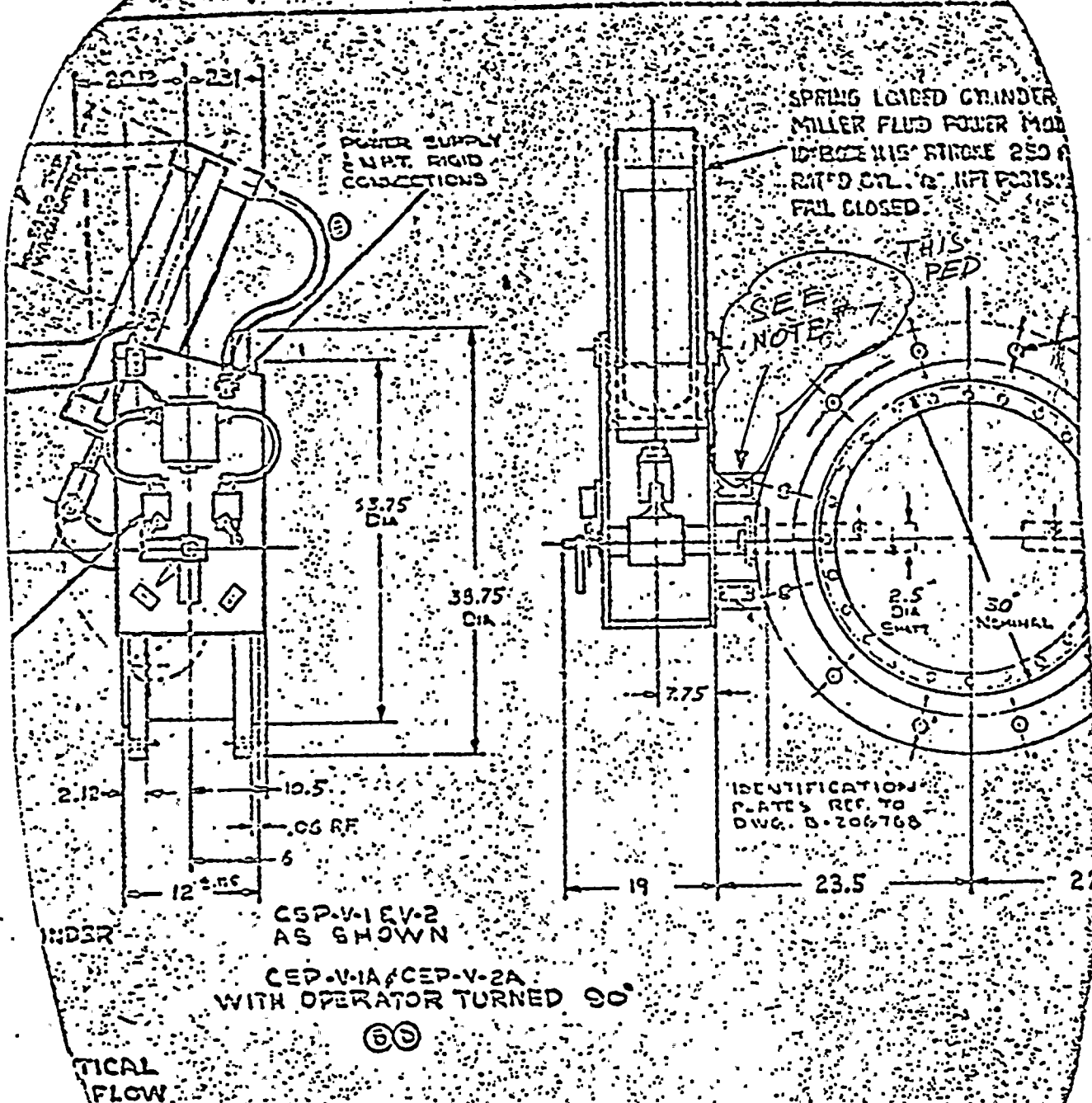
AUG 01

T. VALVES TO BE MANUFACTURED IN STRICT ACCORDANCE WITH ASME
BOILER/PRESSURE VESSEL CODE, SECTION III CLASS 2, APPENDIX A, WATER OF 773

NOTES: UNLESS OTHERWISE SPECIFIED

[illegible]

REF. DOC: PCN		RFI		WPPSS NUCLEAR PROJECT NO. 2	
REF SPEC. SECTION:		PAGE:		PARA:	
REF DWG: 68-00-0006		DWG. ZONE:		PED 215-B-X087 SHT. 9 OF 10	
SCALE:	DRAWN BY: ACF	DATE: 8/5/83	Rev. C		
	CHKD BY: JMH	DATE: 8/10/83	APPVD: ABH	DATE: 8/14/83	TITLE: NOTE ADDITION



REF. DOC: PCN

RFI

WPPSS NUCLEAR PROJECT NO. 2

REF SPEC. SECTION:

PAGE:

PARA:

BURNS AND ROE, INC.

REF DWG: 68-00-000.8

DWG. ZONE:

PED 215-B-X087 SHT. 10 OF 10

SCALE:

DRAWN BY

RCF

DATE:

8/9/80

CHKD BY

ARK

DATE

9/1/81

APPVD: KKH

DATE

8/1/81

TITLE:

NOTE

ADDITION

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

FILE 22.0 E
CSF V-1

STARTUP WORK REQUEST

PLANT 2SWR- 14505

1. INITIATED BY/ORGANIZATION/DATE <u>J ROBANSKE/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CSF-V-1</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION & REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER. PER. PED 215-B-X087.</u> <u>MODIFY OPERATOR SUPPORTS PER. SECTION XI PLAN NO. 2-0092 TCS 218384</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>		10. SPR/PCN/SDR/DWG. <u>M543</u> <u>SDR-M-13186</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 66 F2 removed</u> <u>1R 66 isolation for CSF-SPV-1 closed</u> <u>Close CSF-V-1 prior to hanging tags.</u>			
12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires for limit switches.</u>		13. CONTRACTOR REPORT TO "H" <u>FOR INFORMATION ONLY</u> <u>Jim Snyder X4932</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>Cycle valve and check for proper operation and indication</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>Walt Haler 9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Haler 9-23-83</u>	
17. SHIFT SUPERVISOR <u>C. H. Lauer</u>		18. CLEARANCE ORDER NUMBER <u>83-10-85</u>	
18. WORK PERFORMED <u>COMPLETED PER SECTION XI PLAN 1239.</u> <u>BPC EWO 1239 & QCIR LOG LP110 2548</u> <u>J. J. Haler</u> <u>10-28-83</u>		19. MANHOURS EXPENDED <u>NA</u>	
20. WORK COMPLETE, CONTRACTOR TAGS REMOVED <u>J. J. Haler</u> <u>10-28-83</u>			
21. RETEST COMPLETED <u>NO TEST REQUIRED</u> <u>TEST ENGINEER: J. J. Haler DATE: 10-28-83</u>		22. QA DOCUMENT ACCEPTABLE <u>MCL 22869</u> <u>10-28-83</u>	
23. SWR CLOSED <u>Walt Haler</u> <u>11-7-83</u>		24. DATE <u>10-28-83</u>	
25. STARTUP MANAGER <u>Walt Haler</u> <u>11/1/83</u>		26. DATE <u>11/1/83</u>	

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

STARTUP WORK REQUEST

PLANT 2SWR- 14506

1. INITIATED BY/ORGANIZATION/DATE <u>J Robanske/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CSP-V-2</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	

8. DESCRIPTION/REASON FOR REQUESTED WORK
REMOVE CYLINDER OPERATOR FOR MODIFICATION + REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER PER. PED 215-B-X087. MODIFY OPERATOR SUPPORTS PER. SECTION XI PLAN NO. 2-0092 TCS 21B385

9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>	10. SPR/PCN/SDR/DWG. <u>M543 SDR-M-13186</u>
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11. SAFETY TAGS REQUIRED ☒ YES ☐ NO IF YES, SPECIFY
1R 63 F4 removed
1R 63 isolation to CSP-SPV-2 closed
Close CSP-V-2 prior to hanging tags

FOR INFORMATION ONLY

12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires for limit switches</u>	13. CONTRACTOR REPORT TO <u>Jim Snyder x4932</u>
--	---

14. RETEST REQUIRED ☒ YES ☐ NO IF YES, SPECIFY
cycle valve and check for proper indication and operation

15. CONCURRENCE: TEST ENGINEER/DATE <u>[Signature] 9-22-83</u>	16. APPROVED: STARTUP MANAGER/DATE <u>Walt Holler 9-23-83</u>
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17. SHIFT SUPERVISOR <u>[Signature]</u>	DATE <u>10-6-83</u>	CLEARANCE ORDER NUMBER <u>83-10-86</u>
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18. WORK PERFORMED	19. MANHOURS EXPENDED <u>NA</u>
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COMPLETED PER
SECTION XI PLAN NO 2-0092
BPC EWO 1240 - QCIR LOG# NO TEST REQUIRED
LP/10-2540

TEST ENGINEER: [Signature] DATE: 10-12-83[Signature]
10-28-83

MCL 22870

20. WORK COMPLETE, CONTRACTOR TAGS REMOVED

CONTRACTOR <u>[Signature]</u>	DATE <u>10-28-83</u>
----------------------------------	-------------------------

21. RETEST COMPLETED	22. QA DOCUMENT ACCEPTABLE
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TEST ENGINEER <u>[Signature]</u>	DATE <u>11-7-83</u>	DATE <u>10-28-83</u>
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23. SWR CLOSED	DATE <u>11/8/83</u>
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STARTUP MANAGER <u>WJH</u>	DATE <u>11/8/83</u>
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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

CSP-V-3

STARTUP WORK REQUEST

PLANT 2SWR- 14507

1. INITIATED BY/ORGANIZATION/DATE <u>J. ROBANSKE/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CSP-V-3</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR. FOR MODIFICATION & REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER PER. PED 215-B-X087. MODIFY OPERATOR SUPPORTS PER. SECTION XI PLAN NO. 2-0092 TCS 218386</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>		10. SPR/PCN/SDR/DWG. <u>M543 SDR-M-13186</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 65 F3 removed</u> <u>1R 65 isolation for CSP-SPV-3 closed</u> FOR INFORMATION ONLY			
12. SPECIAL REQUIREMENTS <u>Startup will remove and reinstall wires for limit switches.</u>		13. CONTRACTOR REPORT TO <u>Jim Smyke 4932</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>cycle valve and check for proper operation and indication</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>D. S. 9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Haler 9-23-83</u>	
17. SHIFT SUPERVISOR <u>[Signature]</u>		DATE <u>10/3/83</u>	CLEARANCE ORDER NUMBER <u>83-10-6</u>
18. WORK PERFORMED <u>Work Completed Per BPC EWO 1233, & QCIR LP110-2567, & SECTION XI PLAN NO. 2-0092</u>		19. MANHOURS EXPENDED <u>NA</u>	
TEST ENGINEER: <u>[Signature]</u> <u>10-27-83</u>		TEST REQUIRED TEST ENGINEER: <u>[Signature]</u> DATE: <u>10-12-83</u>	
20. WORK COMPLETE CONTRACTOR TAGS REMOVED <u>[Signature]</u> MCL 22871			
21. RETEST COMPLETED TEST ENGINEER: <u>[Signature]</u> DATE: <u>11-7-83</u>		22. QA DOCUMENT ACCEPTABLE <u>[Signature]</u> DATE: <u>11-22-83</u>	
23. SWR CLOSED STARTUP MANAGER: <u>[Signature]</u>		DATE: <u>11/8/83</u>	

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

STARTUP WORK REQUEST

PLANT 2SWR- 14508

1. INITIATED BY/ORGANIZATION/DATE <u>J ROBANSKE/BPL/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CSP-V-4</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPL</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION & REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER PER PED 215-B-X087 MODIFY OPERATOR SUPPORTS PER SECTION II PLAN NO. 2-0092 TCS 218387</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPL</u>		10. SPR/PCN/SDR/DWG. <u>M543 SDR-M-13186</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 64 FI removed</u> <u>1R 64 isolation for CSP-SPV-4</u>			
12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires for limit switches.</u>		13. CONTRACTOR REPORT TO <u>Jim Smyke 4932</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>Cycle valve and check for proper operation and indication</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>JO Sch 9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Haller 9-23-83</u>	
17. SHIFT SUPERVISOR <u>K. Vozell</u>		18. CLEARANCE ORDER NUMBER <u>83-10-7</u>	
18. WORK PERFORMED <u>WORK COMPLETED PER SECTION II PLAN 2-0092 + BPL FWO 1234 + QCIR LP110-2567</u>		19. MANHOURS EXPENDED <u>NA</u>	
20. WORK COMPLETE, CONTRACTOR TAGS REMOVED <u>Jim Robanks</u> <u>10-27-83</u>		21. TEST REQUIRED <u>TEST ENGINEER: J. Schlee DATE: 10-12-83</u>	
21. RETEST COMPLETED <u>DATE 11-7-83</u>		22. QA DOCUMENT ACCEPTABLE <u>DATE 10-27-83</u>	
23. SWR CLOSED <u>Walt Haller</u>		DATE <u>11-10-83</u>	

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

STARTUP WORK REQUEST

PLANT 2SWR- 14512

1. INITIATED BY/ORGANIZATION/DATE <u>J ROBANSKE/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CEP-U-1A</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION + REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER. PER. PED 215-B-X087.</u> <u>MODIFY OPERATOR SUPPORTS PER SECTION XI PLAN NO. 2-0092</u> <u>TCS 218391</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>		10. PREPARED BY <u>Jim Snyder</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 67 F4 removed</u> <u>1R 67 air isolation for CEP-SPU-1A closed</u>			
12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires for limit switches.</u>		13. CONTRACTOR REPORT TO <u>Jim Snyder</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>cycle valve and check for proper operation and indication.</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>W. B. H. 9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Holler 9-23-83</u>	
17. SHIFT SUPERVISOR <u>P. H. Harris</u>		18. CLEARANCE ORDER NUMBER <u>10-5-83</u> <u>83-10-75</u>	
18. WORK PERFORMED <u>WORK COMPLETED</u> <u>PER SECTION XI PLAN 2-0092</u> <u>+ BPC EWO 1237 QC LOG# LP 10-2591</u>		19. MANHOURS EXPENDED <u>NA</u>	
20. WORK COMPLETE, CONTRACTOR TAGS REMOVED <u>W. B. H. 10-21-83</u>			
21. RETEST COMPLETED TEST ENGINEER <u>W. B. H.</u> DATE <u>10-24-83</u>		22. QA DOCUMENT ACCEPTABLE <u>Jim C. Felt</u> DATE <u>10-21-83</u>	
23. SWR CLOSED STARTUP MANAGER <u>W. B. H.</u>		DATE <u>11/1/83</u>	

File 220E
CEP-V-2A

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

GRM

STARTUP WORK REQUEST

PLANT 2

SWR- 14513

1. INITIATED BY/ORGANIZATION/DATE <u>J. Robanste/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CEP-V-2A</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION & REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER, PER. PED. 215-B-X087</u> <u>MODIFY OPERATOR SUPPORTS PER. SECTION II PLAN NO. 2-0092</u> <u>TCS 218392</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>		10. SPR/PCN/SDR/DWG. <u>SDR-M-13186</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <u>F3</u> <u>1R 6S F3 removed</u> <u>1R 6S air isolation for CEP-SPV-2A closed</u>			
12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires for limit switches.</u>		13. CONTRACTOR REPORT TO <u>Jim Symke X4932</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>cycle valve and check for proper operation and indication</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>J. Robanste 9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Holler 9-23-83</u>	
17. SHIFT SUPERVISOR <u>C. H. Carver</u>		DATE <u>10-5-83</u> CLEARANCE ORDER NUMBER <u>83-10-76</u>	
18. WORK PERFORMED <u>Work Completed Per.</u> <u>SECTION II PLAN #2-0092</u> <u>BPC</u> <u>& EWO 1236 QC LOG# LP110-2539</u> <u>NO TEST REQUIRED</u> <u>TEST ENGINEER: J. Robanste DATE: 10-21-83</u>		19. MANHOURS EXPENDED <u>NA</u>	
20. WORK COMPLETE, CONTRACTOR TAGS REMOVED CONTRACTOR <u>J. Robanste</u> DATE <u>10-21-83</u>			
21. RETEST COMPLETED TEST ENGINEER <u>J. Robanste</u> DATE <u>10-24-83</u>		22. QA DOCUMENT ACCEPTABLE <u>Jim C. O'Hara</u> DATE <u>10-21-83</u>	
23. SWR CLOSED STARTUP MANAGER <u>WJH</u> DATE <u>11/1/83</u>			

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

7.1. 220E
CEP-V-3A

STARTUP WORK REQUEST

PLANT 2

SWR-

14514

1. INITIATED BY/ORGANIZATION/DATE <u>J Robanike/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CEP-V-3A</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION & REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER. PER PED 215-B-X087. MODIFY OPERATOR SUPPORTS PER SECTION II PLAN NO. 2-0092 TCS 218393</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>		10. SPR/PCN/SDR/DWG. <u>M543 SDR-M-13186</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 62 F3 removed</u> <u>Av isolation valve in 1R 62 for CEP-SPV-3A closed</u>			
12. SPECIAL REQUIREMENTS <u>start up will remove and re-install wires for limit switches.</u>		13. CONTRACTOR REPORT TO <u>Jim Smyke X4932</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>cycle valve and check for proper indication and operation</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>J. Robanike 9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Hall 9-23-83</u>	
17. SHIFT SUPERVISOR <u>C. Langdon</u>		DATE <u>10-7-83</u> CLEARANCE ORDER NUMBER <u>83-10-96</u>	
18. WORK PERFORMED <u>WORK COMPLETED PER SECTION II PLAN NO. 2-0092 & BPC EWD 1241 & QCIR-LP110-2557</u>		19. MANHOURS EXPENDED <u>NA</u>	
20. WORK COMPLETE, CONTRACTOR TAGS REMOVED <u>J. Robanike</u>		TEST ENGINEER: <u>J. Robanike</u> DATE: <u>10-12-83</u>	
21. RETEST COMPLETED TEST ENGINEER: <u>J. Robanike</u> DATE: <u>11-7-83</u>		DATE: <u>10-27-83</u>	
22. QA DOCUMENT ACCEPTABLE DATE: <u>10-27-83</u>		DATE: <u>11-1-83</u>	
23. SWR CLOSED STARTUP MANAGER: <u>Walt Hall</u>		DATE: <u>11-1-83</u>	

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

FILE 22.0 E
CEP-V-4A

STARTUP WORK REQUEST

PLANT 2SWR- 14515

1. INITIATED BY/ORGANIZATION/DATE <u>J. ROBANSKE/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CEP-V-4A</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION + REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER, PER PED 215-B-X087. MODIFY OPERATOR SUPPORTS PER SECTION XI PLAN NO. 2-0092 TCS 218401</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>		10. SPR/PCN/SDR/DWG. <u>M543</u> <u>SDR-M-13186</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 63 F2 removed</u> <u>1R 63 air isolation for CEP-SPV-4A closed</u>			
12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires for limit switches.</u>		13. CONTRACTOR REPORT TO <u>Vin Snyder X4932</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>cycle valve and check for proper operation and indication.</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>J. Spach 9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Holler 9-23-83</u>	
17. SHIFT SUPERVISOR <u>A. Langdon</u>		18. CLEARANCE ORDER NUMBER <u>83-1095</u>	
19. WORK PERFORMED <u>WORK COMPLETED PER SECTION XI PLAN NO. 2-0092, BPC EWO 1242, + QCIR LP110-2556.</u>		19. MANHOURS EXPENDED <u>NA</u>	
TEST ENGINEER: <u>J. Spach</u> DATE: <u>10-12-83</u> <u>Jim Polanek</u> <u>10-27-83</u>			
20. WORK COMPLETE, CONTRACTOR BY REMOVED CONTRACTOR <u>J. Polanek</u> DATE <u>10-27-83</u>			
21. RETEST COMPLETED TEST ENGINEER <u>J. Spach</u> DATE <u>11-7-83</u>		22. QA DOCUMENT ACCEPTABLE <u>Jim C. [Signature]</u> DATE <u>10-27-83</u>	
23. SWR CLOSED STARTUP MANAGER <u>WSH</u> <u>[Signature]</u>		DATE <u>11/8/83</u>	

File 22.0 E

CSP-V-5

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

STARTUP WORK REQUEST

PLANT 2SWR- 14509

1. INITIATED BY/ORGANIZATION/DATE <u>J ROBANKE/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER/ <u>CSP-V-5</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION + REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER PER. FED 215-B-X087. MODIFY OPERATOR SUPPORTS PER. SECTION XI PLAN NO. 2-0092 TCS 218388</u>			

9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>	10. SPR/PCN/SDR/DWG. <u>M543</u> <u>SDR-M-13186</u>
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 64 F2 removed</u> <u>C/S for CSP-V-5 open</u>	
FOR INFORMATION ONLY	

12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires to limit switches.</u>	13. CONTRACTOR REPORT TO <u>Jim Snyder X4932</u>
--	---

14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>cycle valve and check for proper operation and indication</u>

15. CONCURRENCE: TEST ENGINEER/DATE <u>[Signature]</u> <u>9-22-83</u>	16. APPROVED: STARTUP MANAGER/DATE <u>Walt Holler</u> <u>9-23-83</u>
17. SHIFT SUPERVISOR <u>[Signature]</u>	DATE <u>10/3/83</u> CLEARANCE ORDER NUMBER <u>83-10-5</u>
18. WORK PERFORMED <u>WORK COMPLETED</u>	19. MANHOURS EXPENDED <u>NA</u>

PER. SECTION XI PLAN # 2-0092 TEST REQUIRED
+ BPC E.W.O 1235 + QCIR: 110-2558

TEST ENGINEER: [Signature] DATE: 10-12-83

[Signature]
10-27-83

MCL 22873

20. WORK COMPLETE, CONTRACTOR TAG REMOVED CONTRACTOR <u>[Signature]</u> DATE <u>10-27-83</u>	
21. RETEST COMPLETED TEST ENGINEER <u>[Signature]</u> DATE <u>11-7-83</u>	22. QA DOCUMENT ACCEPTABLE <u>[Signature]</u> DATE <u>12-27-83</u>
23. SWR CLOSED STARTUP MANAGER <u>[Signature]</u> DATE <u>11/1/83</u>	

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

F.16 22.0E

CSP-V-6

STARTUP WORK REQUEST

PLANT 2SWR- 14510

1. INITIATED BY/ORGANIZATION/DATE <u>J. ROBANSKE/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-31-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CSP-V-6</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	
8. DESCRIPTION/REASON FOR REQUESTED WORK <u>REMOVE CYLINDER OPERATOR FOR MODIFICATION & REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS TO ASTM A325 OR BETTER. PER PED 215-B-X087 MODIFY OPERATOR SUPPORTS PER. SECTION XI PLAN NO. 2-0092 TCS 218389</u>			
9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>		10. SPR/PCN/SDR/DWG. <u>M543</u> <u>SDR-M-13186</u>	
11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 63 F1 removed</u>			
FOR INFORMATION ONLY			
12. SPECIAL REQUIREMENTS <u>Start up will remove and reinstall wires to limit switches.</u>		13. CONTRACTOR REPORT TO <u>Jim Smyke 44932</u>	
14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>cycle valve and check for proper operation and indication</u>			
15. CONCURRENCE: TEST ENGINEER/DATE <u>9-22-83</u> <u>9-22-83</u>		16. APPROVED: STARTUP MANAGER/DATE <u>Walt Helle</u> <u>9-23-83</u>	
17. SHIFT SUPERVISOR <u>C. Kuyda</u>		DATE <u>10-7-83</u> CLEARANCE ORDER NUMBER <u>83-10-97</u>	
18. WORK PERFORMED <u>COMPLETED PER. SECTION XI PLAN #2-0092 NO TEST REQUIRED</u> <u>+ BPC EWO 1243 & QCIR #</u> <u>LP110-2559</u>		19. MANHOURS EXPENDED <u>NA</u>	
TEST ENGINEER: <u>J. Robanske</u> DATE: <u>10-12-83</u> <u>10-3-83</u>			
20. WORK COMPLETE, CONTRACTOR TAGS REMOVED CONTRACTOR <u>Jim Robanske</u> DATE <u>11-3-83</u>			
21. RETEST COMPLETED TEST ENGINEER <u>J. Robanske</u> DATE <u>11-7-83</u>		22. QA DOCUMENT ACCEPTABLE <u>Jim O. [Signature]</u> DATE <u>11-3-83</u>	
23. SWR CLOSED STARTUP MANAGER <u>Walt Helle</u>		DATE <u>11/8/83</u>	

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

GRIT

STARTUP WORK REQUEST

PLANT 2SWR- 14511

1. INITIATED BY/ORGANIZATION/DATE <u>J ROBANSKE/BPC/9-22-83</u>	2. SYS. NO. <u>22.0</u>	3. REQUIRED COMPLETION DATE <u>10-30-83</u>	4. PREFERRED START DATE/TIME <u>9-23-83</u>
5. EQUIPMENT/PIECE NUMBER <u>CSP-V-9</u>	6. QUALITY CLASS <u>1</u>	7. WORK TO BE PERFORMED BY <u>BPC</u>	

8. DESCRIPTION/REASON FOR REQUESTED WORK

REMOVE CYLINDER OPERATOR FOR MODIFICATION & REPLACE THE FOUR EXISTING ASTM A307 STUD BOLTS, TO ASTM A325 OR BETTER. PER. PED 215-B-X087. MODIFY OPERATOR SUPPORTS PER. SECTION II PLAN NO. 2-0092 TCS 218390

9. MATERIAL TO BE SUPPLIED BY <u>BPC</u>	10. SPR/PCN/SDR/DWG. <u>11543</u> <u>SDR-M-13186</u>
---	---

11. SAFETY TAGS REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>1R 64 F3 removed</u>	FOR INFORMATION ONLY
---	----------------------

12. SPECIAL REQUIREMENTS <u>Start-up will remove and reinstall wires for limit switches.</u>	13. CONTRACTOR REPORT TO <u>Vin Smyke X4932</u>
---	--

14. RETEST REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY <u>Cycle valve and check for proper operation and indication</u>

15. CONCURRENCE: TEST ENGINEER/DATE <u>NOB</u> <u>9-22-83</u>	16. APPROVED: STARTUP MANAGER/DATE <u>Walt Hall</u> <u>9-23-83</u>
--	---

17. SHIFT SUPERVISOR <u>C. H. Garry</u>	DATE <u>10-5-83</u>	CLEARANCE ORDER NUMBER <u>83 1074</u>
--	------------------------	--

18. WORK PERFORMED <u>WORK COMPLETED PER</u>	19. MANHOURS EXPENDED <u>NA</u>
---	------------------------------------

SECTION II PLAN NO. 2-0092 & BPC EWO 1238, + QCIR LP 110-2560.

NO TEST REQUIRED

10-27-83

TEST ENGINEER: J. Shaker DATE: 10-12-83

20. WORK COMPLETE, CONTRACTOR TAGS REMOVED CONTRACTOR <u>J. Shaker</u> DATE <u>10-27-83</u>	22. QA DOCUMENT ACCEPTABLE DATE <u>10-27-83</u>
21. RETEST COMPLETED TEST ENGINEER <u>NOB</u> DATE <u>11-7-83</u>	23. SWR CLOSED STARTUP MANAGER <u>Walt Hall</u> DATE <u>11/1/83</u>

MCL 22875

File 22.0E
per block 1

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

STARTUP DEFICIENCY REPORT

PROJECT 2

1. EQUIPMENT CSP-V-1 2 3 4 5, 6 + 9 and CEP-V-1A, 2A, 3A + 4A	2. SYS. NO. 22.0	3. ORIGINATOR Snyder	4. SDR- M 13156
5. QUAL. CLASS 1	6. REFERENCES/RELATED DOCUMENTS 215-B-X087	7. ATTACHMENTS 10M 6-9-83 Holmberg to Hickman WPBIR-F-83-45-7/WPBR-F-83-511	8. DATE 9-22-83

9. DESCRIPTION OF DEFICIENCY: (ATTACH ADDITIONAL SHEETS AS NECESSARY)

FR PED 215-B-X087 has not been implemented. It modifies the mounting for the air operators on the valves listed in block 1.

FOR INFORMATION ONLY

10. REQUIRED COMP. DATE 10-28-83	11. ORGANIZATION/PERSON RESPONSIBLE FOR COMPLETION BPC / Montenegro
12. MILESTONE FL	13. M.C.L. ENTRY REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO BY K Dallas DATE 9-26-83
14. SYSTEM STATUS AT TIME OF DEFICIENCY <input checked="" type="checkbox"/> PROVISIONALLY ACCEPTED	SLT: <input checked="" type="checkbox"/> IN PROGRESS <input type="checkbox"/> COMPLETE PREOP: <input type="checkbox"/> IN PROGRESS <input type="checkbox"/> COMPLETE

15. REMARKS:

SWR's will be individually written to BPC.

THIS WORK DOCUMENT
CONTAINS QC HOLD POINTS

Notify WPPSS ~~QC~~ QC if S/U or WPPSS performs any work.

Hickman 9-27-83

16. REVIEWED: TEST ENGINEER <u>DR</u> DATE 9-22-83	17. APPROVED: STARTUP MANAGER <u>[Signature]</u> DATE 9-22-83
18. DEFICIENCY CORRECTED - ACTION TAKEN: Mounting brackets for valves listed in block 1 modified by BPC per SWR's 14505 → 14515. All air operator reassembled and valves stroked properly.	19. SWR-14505 → 14515 IF APPLICABLE

MCL 22869-22879

20. COMPLETED BY BPC per SWR's 14505 → 14515	DATE 11-7-83
21. REVIEWED/INSPECTED BY <u>DR</u> <u>NO WPPSS QC INSP. REQUIRED</u> <u>Hickman</u>	DATE 11-7-83
22. APPROVED - STARTUP MANAGER <u>[Signature]</u>	DATE 11-15-83
23. MCL ENTRY, IF APPLICABLE BY K Dallas	DATE 11-16-83

INTERNAL DISTRIBUTION

THIS LETTER (DOES) (DOES NOT) ESTABLISH A NEW COMMITMENT

DA Armstrong 575 sf 2 9178
 BA Holmberg 906D kf/file 904A
 JD Martin 927M WNP-2 Files 917Y
 JE Rhoads 575 LTH/Lb 904A
 PK Shen 580 RWH/Lb 575
 WW Waddel 400

WPPSS CORRESPONDENCE NO.

9/21/83

July 12, 1983
 WPBR-F-83-457

Mr. A. I. Cygelman
 Manager, Site Engineering
 Burns and Roe, Incorporated
 P.O. Box 200
 Richland, WA 99352

FOR INFORMATION ONLY

Subject: NUCLEAR PROJECT 2
 STRUCTURAL MODIFICATIONS TO
 THE PURGE AND VENT VALVES

Please initiate a PED to implement the structural modifications to the
 purge and vent valves described in the attached memorandum.

There is a commitment to the NRC to perform this task prior to commercial
 operation of the plant.

LTH

L. T. Harrold, Mail Drop 904A Assistant Director, WNP-2 Engineering

RWH/sms

Attachment

cc: WS Chin, BPA (399)
 JA Forrest, B&R RO
 J Kraus, B&R Site
 AN Kugler, B&R Site (901A)
 TE Logan, BPC (981)
 TA Mangelsdorf, BPC (982)
 H Powell, BPC (904A)
 JJ Verderber, B&R NY

Author	RW Hickman <i>RW Hickman</i> 7-7-83		For Signature of: LT Harrold <i>LTH</i>	
Section				
Approval of	DA Armstrong	JE Rhoads	WW Waddel	BA Holmberg
Approved	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
Date	7/7/83	7/7/83	7/7/83	7/11/83

INTEROFFICE MEMORANDUM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

GE-02-RWH-83-009

Distribution:

- ☐ EDC WNP-1/4
- ☒ EDC WNP-2
- ☐ EDC WNP-3/5
- ☐ Admin File

DA Armstrong *DA*

FG Buck

JE Rhoads

J. Strohm

WW Haddel *WW*

WNP-2 Files

RWH/lb

WE Faraone

CJ Foley

Date: June 9, 1983

To: B. A. Holmberg, 904A
J. E. Rhoads

From: R. W. Hickman, 575 *R. W. Hickman*

Subject: MODIFICATION TO PURGE AND VENT LINES

- Reference: a) Letter, G. D. Bouchey to A. Schwencer, G02-83-170, dated February 24, 1983.
- b) IOM, GE-02-RWH-83-003, R. W. Hickman to B. A. Holmberg, J. E. Rhoads, dated February 10, 1983.

FOR INFORMATION ONLY

Reference a) addressed the operability verification of the purge and vent valves and promised a stress analysis which would complete the qualification of these valves.

Reference b) recommended that the piping analyses be refined to reduce the loads on these valves below a predetermined value. Burns & Roe, Woodbury, performed the necessary analyses and did, indeed, lower the accelerations which the valve operators experience below the required values.

The analytical consultant then performed the calculations and determined that these valves were acceptable for use for at least five years. Their conclusion was that two of the valves must be modified before that time in order to pass fatigue requirements.

Supply System review of the analyses revealed an unacceptable assumption. The valves do not meet stress requirements and must be modified prior to operation of the plant. The modification is in two parts.

1. The ASTM A307 bolts attaching the operator assemblies to the valve ears must be replaced with ASTM A325 or better bolts.
2. The structural modification detailed on the attached sketch must be performed to valves CSP-V-1,-2,-3,-4,-5,-6,-9 and CEP-V-1A,-2A,-3A, and -4A.

The analyses also do not demonstrate that the operators will function during the dynamic event. This must be confirmed by the Operability Test Program. If the test were performed prior to the modifications being made, a structural failure could result. Therefore, the modification must be accomplished to CSP-V-3 in time to perform the test.

INTERNAL DISTRIBUTION

THIS LETTER (DOES) (DOES NOT) ESTABLISH A NEW COMMITMENT

DA Armstrong 575 sf 2 917B
 A Holmberg 906D kf/file 904A
 D Martin 927M LTH/Lb 904A
 Rhoads 575 RWH/Lb 575
 PK Shen 580 WNP-2 Files 917Y
 WW Waddel 400

WPPSS CORRESPONDENCE NO. _____

August 10, 1983
 WPBR-F-83-511

Mr. A. I. Cygelman
 Manager, Site Engineering
 Burns and Roe, Incorporated
 P. O. Box 200
 Richland, WA 99352

FOR INFORMATION ONLY

Subject: NUCLEAR PROJECT 2
 STRUCTURAL MODIFICATION TO PURGE AND VENT VALVES

Reference: WPBR-F-83-457, LT Harrold to AI Cygelman, same subject,
 dated July 12, 1983

The attached sketches modify design details provided in the referenced letter. The valve analyses have been reviewed and found to be acceptable with this modification. The change was necessary, as the clearance and physical conditions of the valves limited the amount of additional bracing possible.

LTH
 L. T. Harrold, Mail Drop 904A
 Assistant Director, WNP-2 Engineering

RWH/sms

cc: WS Chin, BPA (399)
 JA Forrest, B&R RO
 J Kraus, B&R Site
 AN Kugler, B&R Site (901A)
 TE Logan, BPC (981)
 TA Mangelsdorf, BPC (982)
 N Powell, BPC (904A)
 JJ Verderber, B&R NY

Author <i>RW Hickman</i> RW Hickman		For Signature of: LT Harrold <i>LTH</i>			
Section					
Approval of	DA Armstrong	JE Rhoads	WW Waddel	BA Holmberg	
Approved	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
Date	8/11/83	8/11/83	8/11/83	8/15/83	

Subject DEBRIS SCREEN - INSIDE CONTAINMENT

Checked By

AVS

Date

12-8-83

System CEP/GSP

Job No

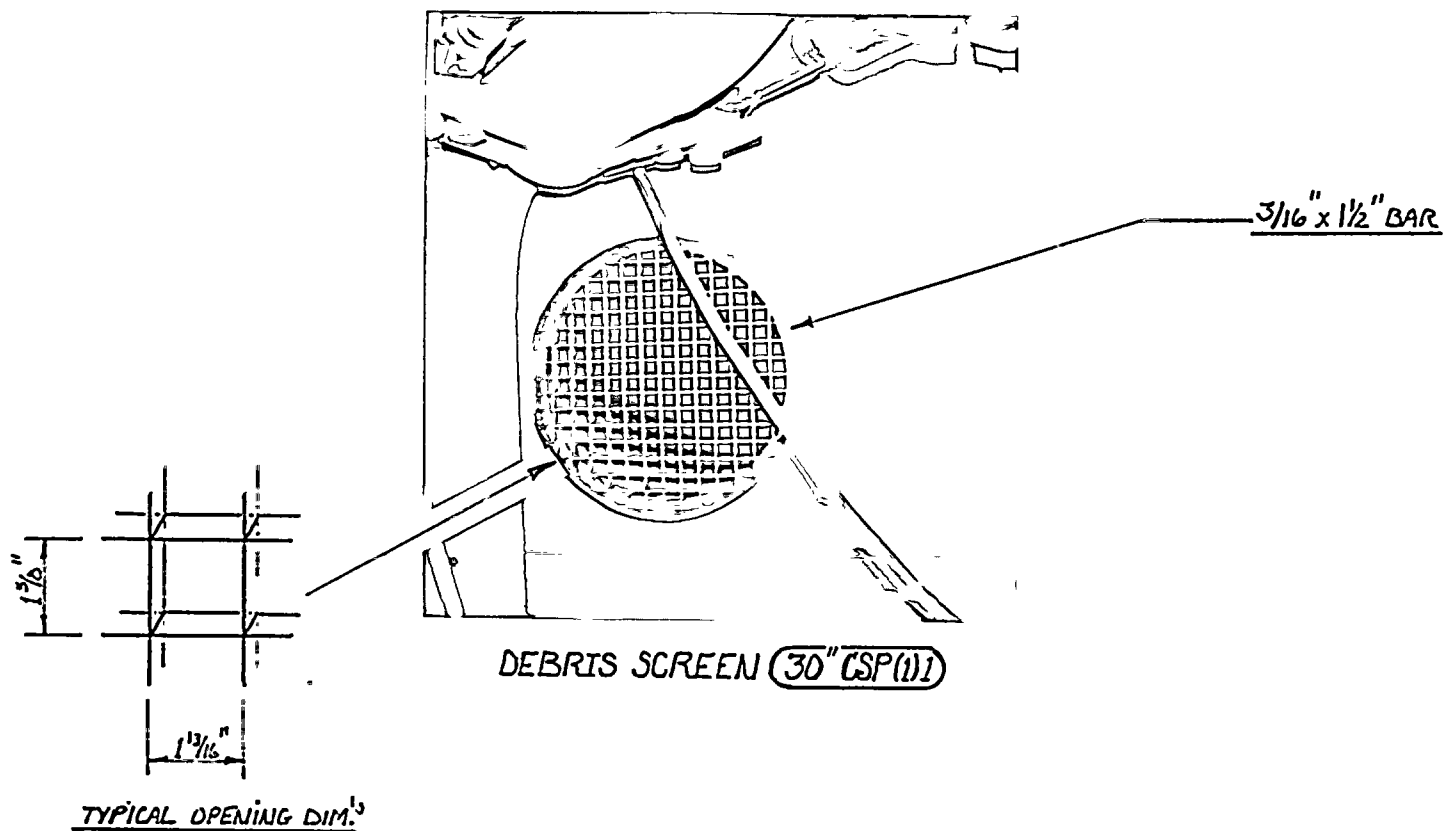
File No

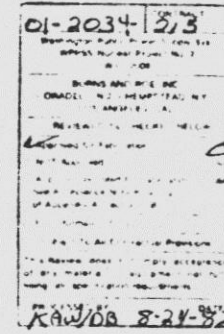
Analysis No GID 361104, 106

Rev No

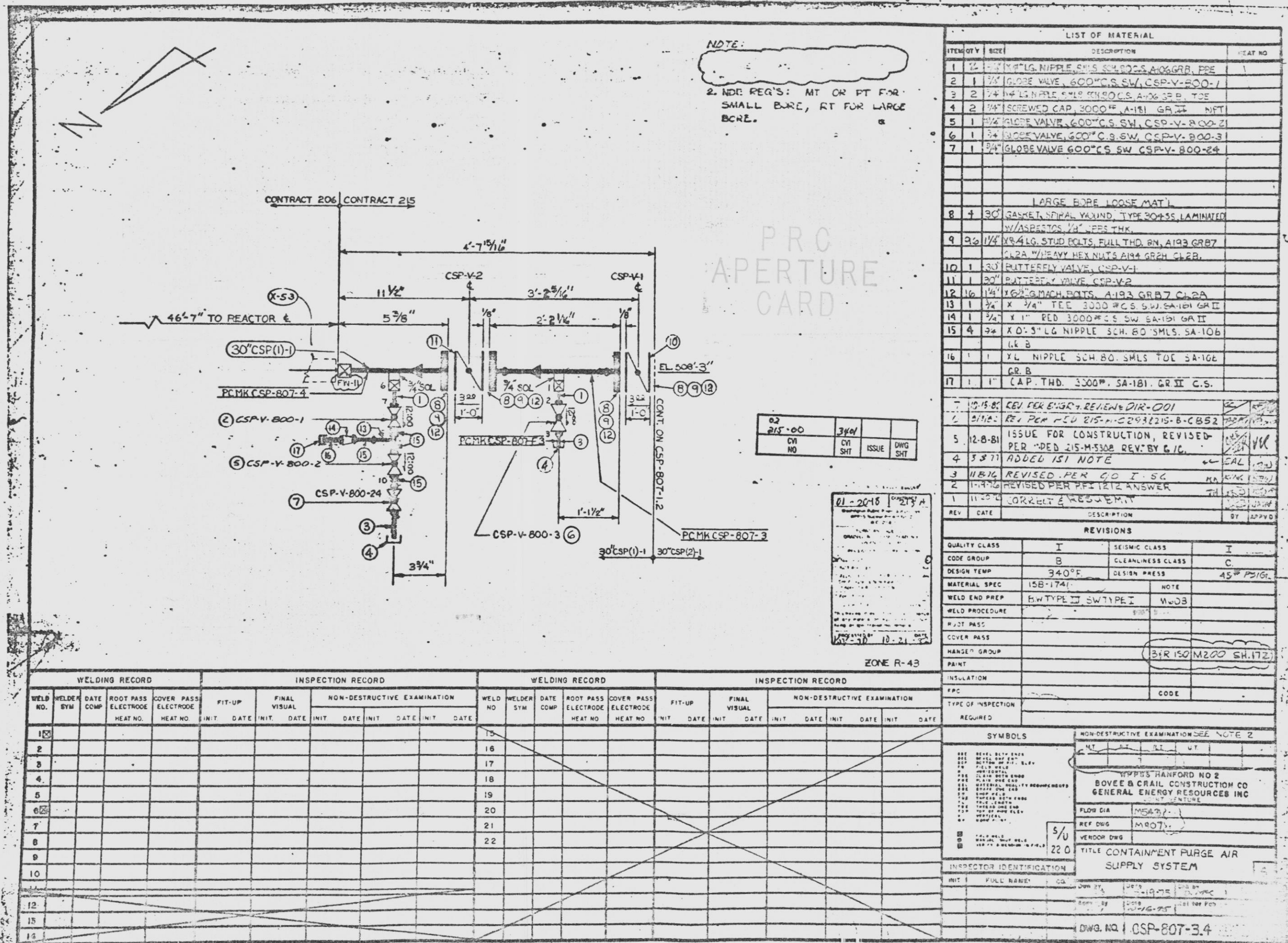
Sheet No

1 OF 1





8312300164-01



NOTE:
2. NDR REG'S: MT OR PT FOR
SMALL BORE, RT FOR LARGE
BORE.

LIST OF MATERIAL			
ITEM	QTY	SIZE	DESCRIPTION
1	12	1/2"	1/2" LG. NIPPLE SCH. 40 SMLS. A-181 GR. II
2	1	1/2"	GLOBE VALVE, 600°C.S. SW. CSP-V-800-1
3	2	1/2"	1/2" LG. NIPPLE SCH. 40 SMLS. A-181 GR. II
4	2	1/2"	SCREWED CAP, 3000# C.S. SW. SA-181 GR. II
5	1	1/2"	GLOBE VALVE, 600°C.S. SW. CSP-V-800-2
6	1	1/2"	GLOBE VALVE, 600°C.S. SW. CSP-V-800-3
7	1	1/2"	GLOBE VALVE, 600°C.S. SW. CSP-V-800-24
LARGE BORE LOOSE MAT'L			
8	4	30"	GASKET, SPIRAL WOUND, TYPE 304SS, LAMINATED W/ASBESTOS, 1/4" SEES THK.
9	2	1/4"	1/4" LG. STUD BOLTS, FULL THD. 8N, A193 GR. B7 1/2" X 1/4" HEAVY HEX NUTS A194 GR. B7
10	1	30"	BUTTERFLY VALVE, CSP-V-1
11	1	30"	BUTTERFLY VALVE, CSP-V-2
12	1	1/4"	1/4" LG. STUD BOLTS, A193 GR. B7 CAPS
13	1	1/4"	1/4" X 1/4" TEE, 3000# C.S. SW. SA-181 GR. II
14	1	1/4"	1/4" X 1/4" TEE, 3000# C.S. SW. SA-181 GR. II
15	4	3/4"	3/4" LG. NIPPLE SCH. 40 SMLS. SA-106 GR. B
16	1	1"	1" LG. NIPPLE SCH. 40 SMLS. TOE SA-106 GR. B
17	1	1"	CAP. THD. 3000# SA-181 GR. II C.S.

02	215-00	3/4"	ISSUE	DWG	SHT
01	215-00	3/4"	ISSUE	DWG	SHT

01-20-18
DATE
10-21-18
BY
10-21-18

ZONE R-43

WELDING RECORD									
WELD NO.	WELDER	DATE	ROOT PASS	COVER PASS	FIT-UP	FINAL VISUAL	NON-DESTRUCTIVE EXAMINATION	WELD NO.	WELDER
1								15	
2								16	
3								17	
4								18	
5								19	
6								20	
7								21	
8								22	
9									
10									
11									
12									
13									

SYMBOLS

NON-DESTRUCTIVE EXAMINATION SEE NOTE 2

WPPUS HANFORD NO 2
BOVEE & CRAIL CONSTRUCTION CO
GENERAL ENERGY RESOURCES INC

FLOW DIA: 1554.7
REF DWG: M007
VERDOR DWG: 22.0

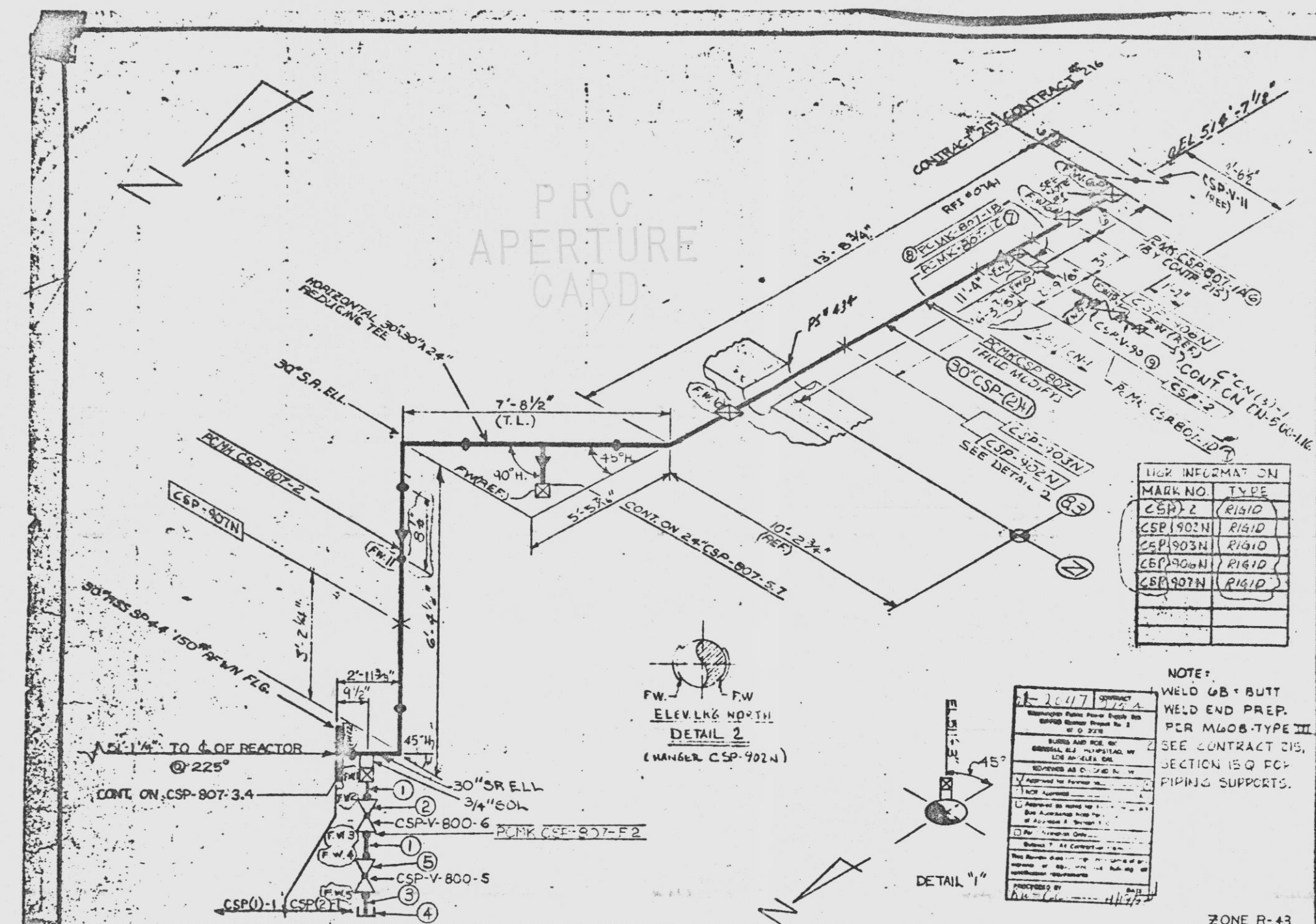
TITLE: CONTAINMENT PURGE AIR SUPPLY SYSTEM

INSPECTOR IDENTIFICATION

INIT: FULL NAME: CO: DATE: 10-21-18

DWG. NO: CSP-807-3.4

8312 300164-03



LIST OF MATERIAL			
ITEM	QTY	SIZE	DESCRIPTION
1	2	3/4"	1/2" LG NIPPLE, SCH 80CS, AGGREG PRE
2	1	1/2"	GLOBE VALVE, 600#CS, SW CSP-V-800-6
3	1	3/4"	1/2" LG NIPPLE, SCH 80CS, AGGREG PRE
4	1	3/4"	CAP, 3000# CS, A-105 NPT
5	1	3/4"	GLOBE VALVE, 600#CS, SW CSP-V-800-5
6	1	30"	X6" LG. PUP. PIECE, W, WELDED, A155, CL.1.
7	1	6"	X2-1" G. PIPE SCH 40 SMLS A 66 GR. B
8	1	30"	X6" WELDOLE SCH 40 SMLS CS BWA 345 GR. B
9	1	6"	GATE VALVE (CSP-V-90)

MARK NO.		TYPE
CSP-902N	1	RIGID
CSP-903N	1	RIGID
CSP-906N	1	RIGID
CSP-907N	1	RIGID

REV	DATE	DESCRIPTION	BY	APPROV
8	11-8-82	REV. PER HANGER REVIEW FOR CSP-807-		
7	7-18-82	REVISED PER PED-215-D-B427		
6	12-8-81	"AS BUILT CONFIGURATION AND MATERIAL SATISFACTORY" REV BY GIC.		
5	11-4-78	REVISED PER PED-215-M-0215		
4	9-27-77	RELEASED HOLD PER BRAC-215-77-2419		
3	11-21-77	REF 215-1773		
2	11-20-76	DELETED 3' WOL. FOR CN CONN. PER.		
1	11-20-76	CORRECT + RES. ADMIN		

11/2/77

WELDED BUTT JOINT

WELDED END PREP

PER M608-TYPE III

SEE CONTRACT 215,

SECTION 15.0 FOR

PIPING SUPPORTS.

NOTE:

WELD 6B BUTT

WELD END PREP

PER M608-TYPE III

SEE CONTRACT 215,

SECTION 15.0 FOR

PIPING SUPPORTS.

WELDING RECORD									
WELD NO.	WELDER	DATE	ROOT PASS	COVER PASS	FIT-UP	FINAL	NON-DESTRUCTIVE EXAMINATION		
NO.	SYM	COMP	ELECTRODE	ELECTRODE	INIT.	DATE	INIT.	DATE	INIT.
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									

SYMBOLS

WPPSS HANFORD NO 2

BOVEE & CRAIG CONSTRUCTION CO

GENERAL ENERGY RESOURCES INC

FLOW DIA M543/D-5

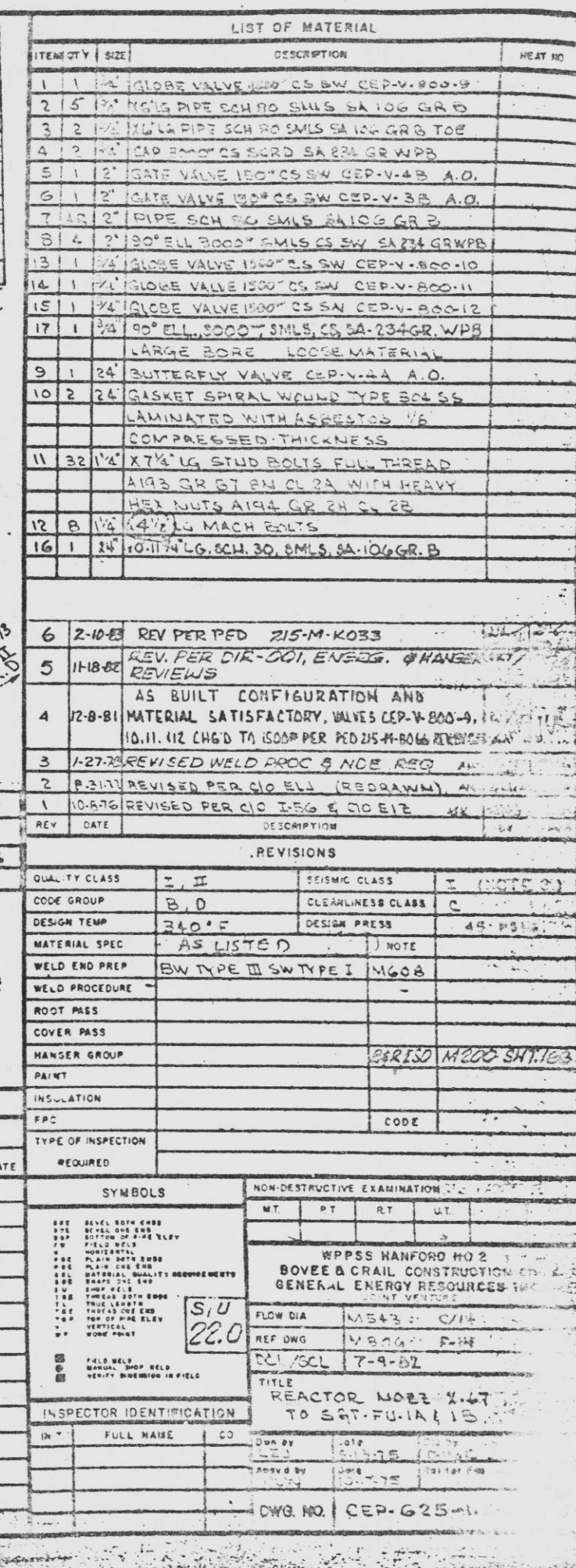
REF DIA M802

VENDOR DIA

TITLE CONTAINMENT PURGE AIR

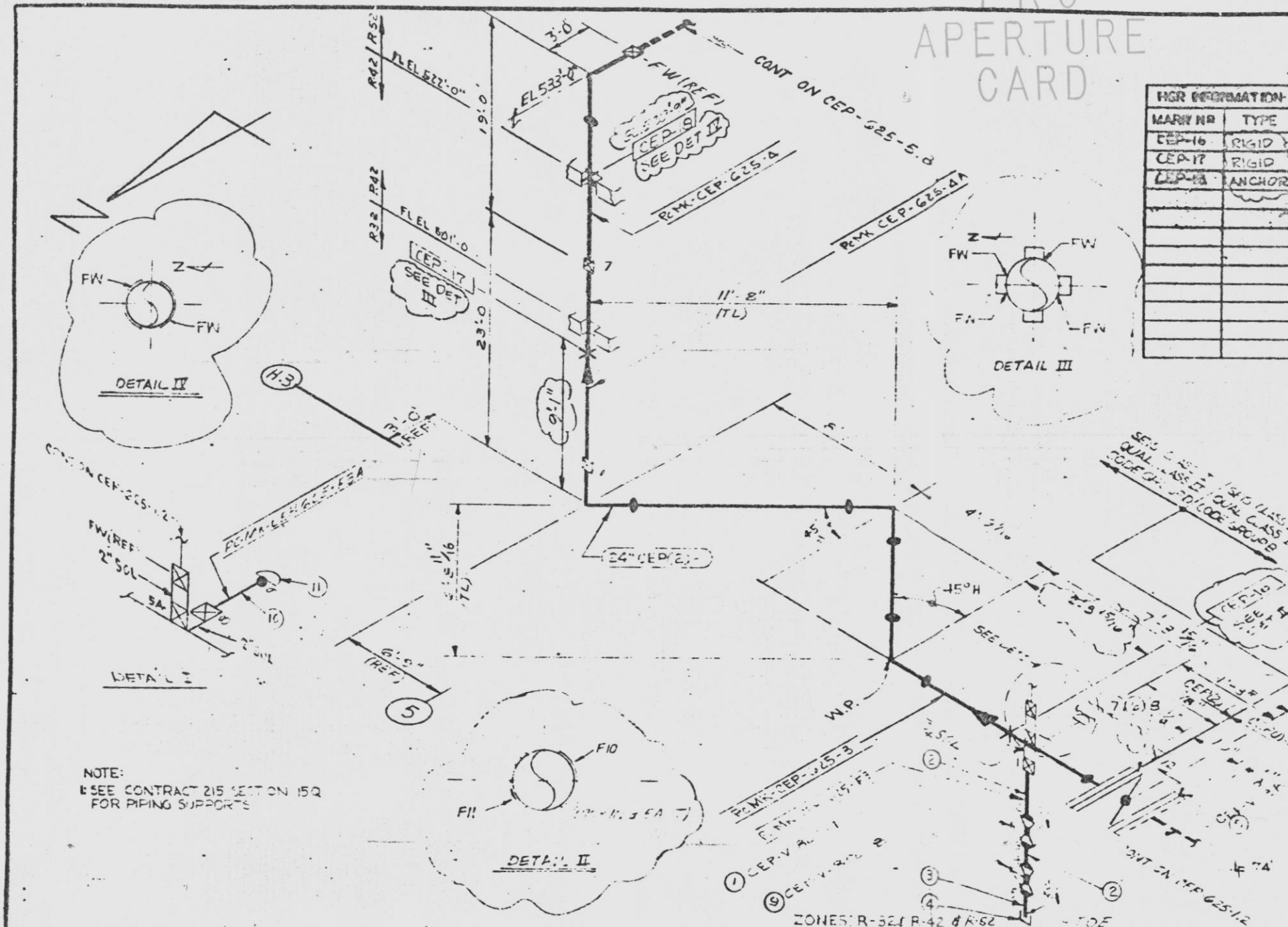
SUPPLY SYSTEM

83123 00164-04

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8312300164-05

PRC
APERTURE
CARD



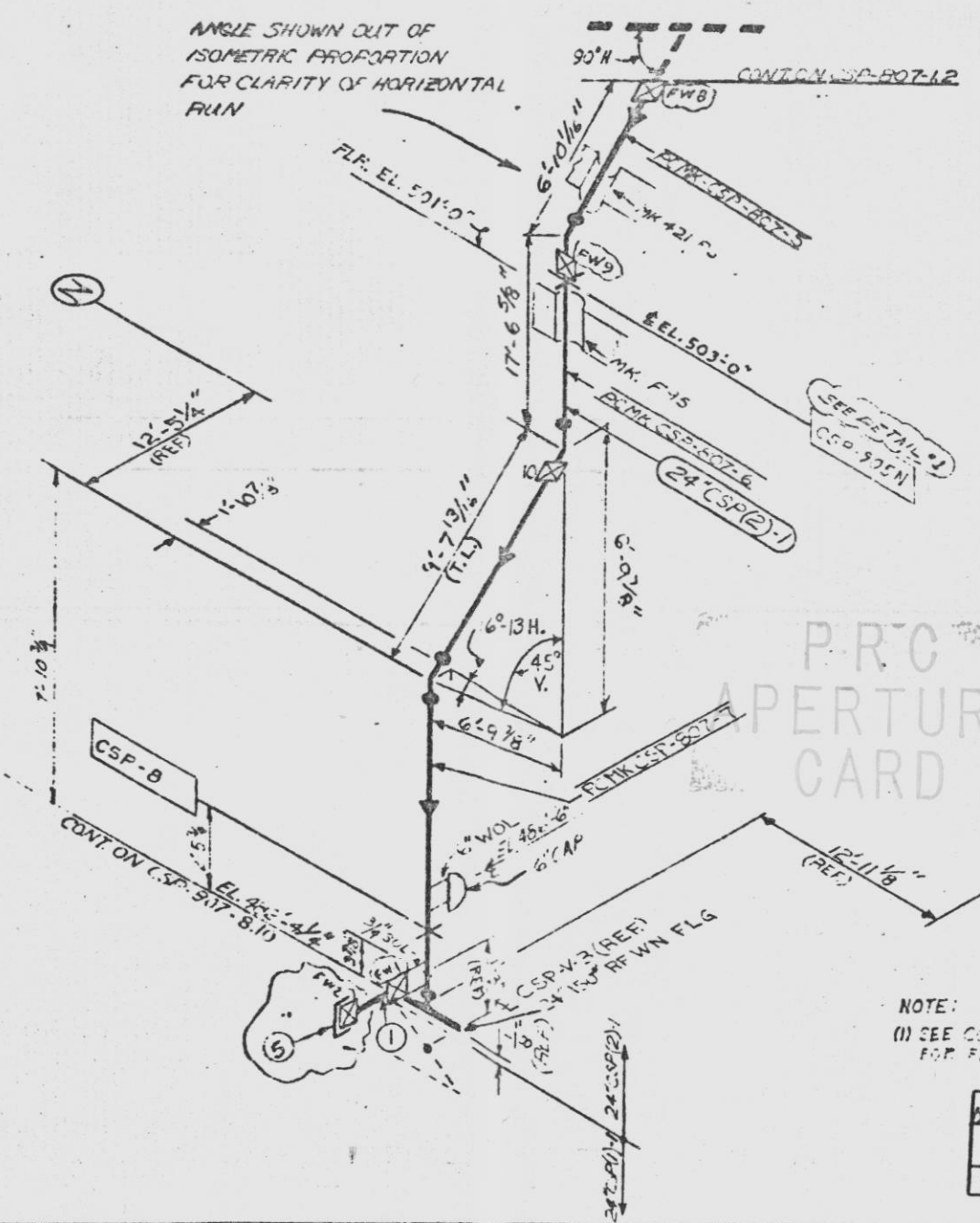
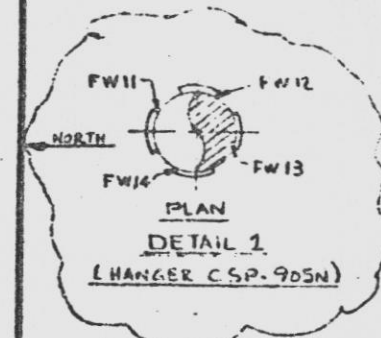
LIST OF MATERIAL				
ITEM	QTY	SIZE	DESCRIPTION	PLANT NO
1	1	3"	VALVE GLOBE CEP-V-800-7 600°PS SW	
2	2	3/8"	1/2" NIPPLE SCH 40 S.S. 4106 LF	
3		3/8"	1/2" NIPPLE S & W S.S. 4106 LF TOE	
4	1	3/4"	PIPE CAPCS 1/2" 4106 1 LF	
5	1	3/4"	GLOBE VALVE 600°PS SW CEP-V-800-6	
10	1	2"	KW GPIPE SCH 40 S.S. 4106 1 LF	
11		2"	CAP 600°PS SW 4106	
			LARGE BORE LIGNE MATERIAL	
5	1	24"	VALVE BUTTERFLY CEP-V-BA, A.D.	
2	2	24"	GASKET 1/2" 1/2" THK BRASS WND TYPE 1 1/2" 1/2" LANTN W/ASBESTOS	
7	1	4"	1/2" 1/2" FULL THK 4106 BR-4106 AN 1/2" 1/2" W/ 1/2" HEX NUT 1/2" 1/2" 1/2" 1/2"	
6	5	1/2"	1/2" 1/2" NUT 1/2" 1/2" 1/2" 1/2"	
			RA 1/2" 1/2"	

REV	DATE	DESCRIPTION	BY	APP'D
1	2-2-54	REV PER DRUGS 3-4-50, NAVA 11-1-54	JK	JK
2	2-2-54	AD BUILT CONFIGURATION AND MATERIAL SATISFACTORY REV BY GIC	JK	JK
3	2-2-54	REV PER GIC 2-5-54	JK	JK
4	2-2-54	REV PER GIC 2-5-54	JK	JK
5	2-2-54	REV PER GIC 2-5-54	JK	JK
6	2-2-54	REV PER GIC 2-5-54	JK	JK
7	2-2-54	REV PER GIC 2-5-54	JK	JK
8	2-2-54	REV PER GIC 2-5-54	JK	JK
9	2-2-54	REV PER GIC 2-5-54	JK	JK
10	2-2-54	REV PER GIC 2-5-54	JK	JK
11	2-2-54	REV PER GIC 2-5-54	JK	JK
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23	2-2-54	REV PER GIC 2-5-54	JK	JK
24	2-2-54	REV PER GIC 2-5-54	JK	JK
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67	2-2-54	REV PER GIC 2-5-54	JK	JK
68	2-2-54	REV PER GIC 2-5-54	JK	JK
69	2-2-54	REV PER GIC 2-5-54	JK	JK
70	2-2-54	REV PER GIC 2-5-54	JK	JK

REVISIONS			
QUALITY CLASS	1.1	STAIN CLASS	1.1 (NOTED)
CODE GROUP	M. 2	CLEANLINESS CLASS	0
DESIGN TEMP	-40° F	CORROSION CLASS	4E (NOTED)
WATER ALK. REQ.	5000 (REV. 4E) 1	NOTE	
WELD END PROD	1.1 (REV. 4E) 1		
WELD CRACKING			
BOILER PRESS			
COVER PRESS			
HANGER GROUP			
PAINT			
INSULATION			
FPC			
TYPE OF INSULATION			

[illegible][illegible]

8312300164-0.6



WELD INFORMATION	
WELD NO.	WELD TYPE
CSP-9	RIGID
CSP-10	RIGID

WELD INFORMATION	
WELD NO.	WELD TYPE
CSP-9	RIGID
CSP-10	RIGID
CSP-11	RIGID
CSP-12	RIGID
CSP-13	RIGID
CSP-14	RIGID
CSP-15	RIGID
CSP-16	RIGID
CSP-17	RIGID
CSP-18	RIGID
CSP-19	RIGID
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CSP-96	RIGID
CSP-97	RIGID
CSP-98	RIGID
CSP-99	RIGID
CSP-100	RIGID

NOTE:
(1) SEE CONTRACT 215 SECTION 15.2 FOR PIPE SUPPORTS

CVI NO.	CVI SHT	ISSUE	DWG SHT
0221560	34021		

CARD NO. OF ZONE R-45

LIST OF MATERIAL				
ITEM	QTY	SIZE	DESCRIPTION	HEAT NO
1	15	3/4"	X4 LG. NIPPLE S.W. 3000 F.S. A-106 GRB	
5	1	3/4"	C.N.P. SW 3000 F.S. A-105	

REV	DATE	DESCRIPTION	BY	APPROV
5	11-9-82	REV. PER HANFORD NO 2 BOVEE & CRAIL CONSTRUCTION CO		
4	12-8-81	REV. FOR CONSTRUCTION		
3	2-15-81	ADDED 6 CAP PER RE-25-1773		
2	11-8-80	REVISED PER I.D. I-56		
1	11-2-79	CORRECTED RES-25-1		

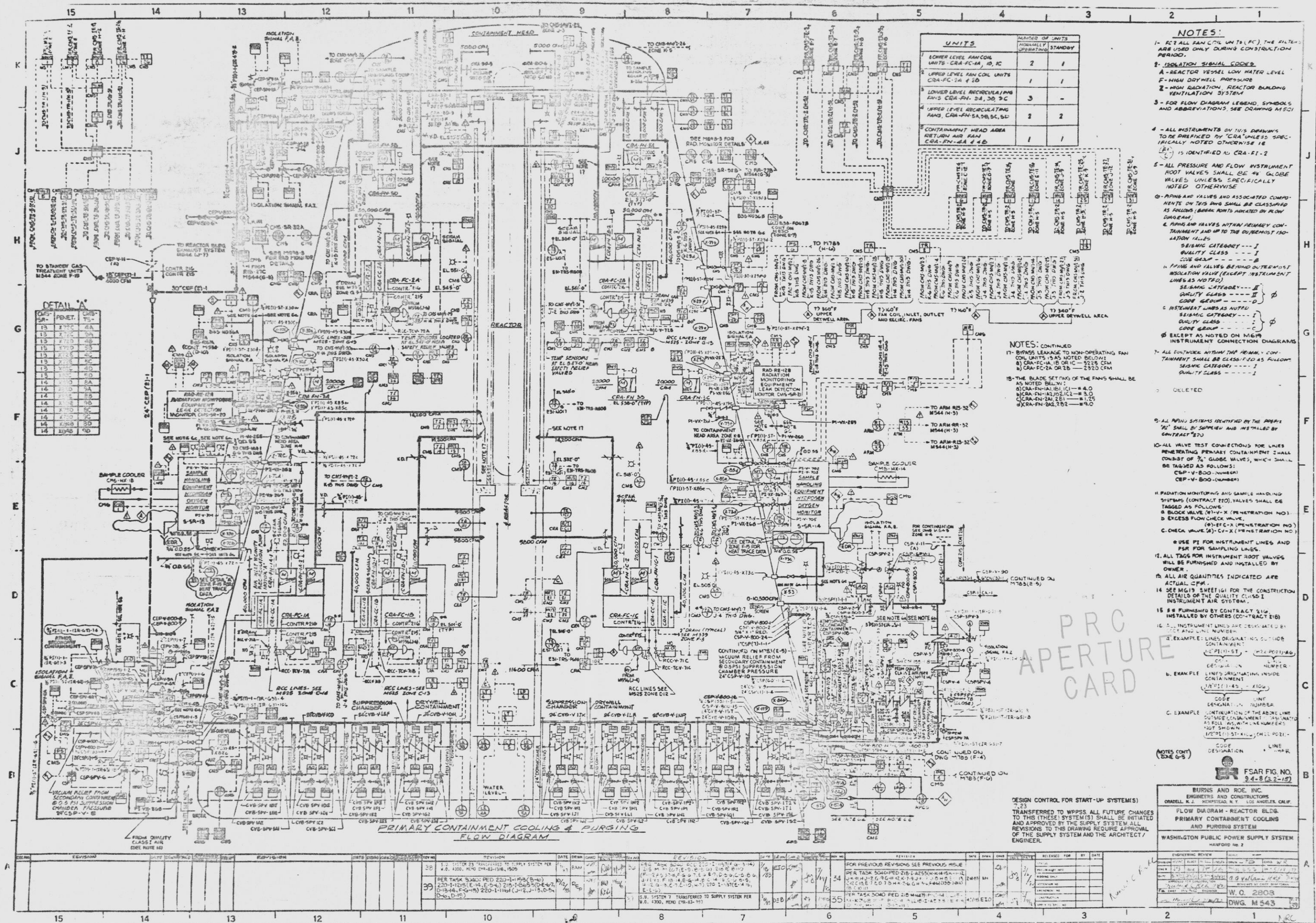
REVISIONS			
QUALITY CLASS	II	SEISMIC CLASS	I (SEE NOTE 1)
CODE GROUP	D	CLEANLINESS CLASS	D
DESIGN TEMP	340°F	DESIGN PRESS	45 PSIG
MATERIAL SPEC	15R-175	NOTE	
WELD END PREP	S.W. TYPE II	S.W. TYPE I	M608
WELD PROCEDURE			
ROOT PASS			
COVER PASS			
HANGER GROUP		24R	M200 SHT 172
PAINT			
INSULATION			
FPC			
TYPE OF INSPECTION			
REQUIRED			

SYMBOLS		NON-DESTRUCTIVE EXAMINATION	
W	WELD	W	WELD
PT	PIPE	PT	PIPE
RT	RADIATION	RT	RADIATION
UT	ULTRASONIC	UT	ULTRASONIC

INSPECTOR IDENTIFICATION	
UNIT	FULL NAME

WPPSS HANFORD NO 2	
BOVEE & CRAIL CONSTRUCTION CO	
GENERAL ENERGY RESOURCES INC	
FLOW DIA	M543 D.4.5
REF DWG	M806 M807
VENDOR DWG	
TITLE CONTAINMENT PURGE AIR SUPPLY SYSTEM	
DWG NO. CSP-907-57	

83/2300164-08



UNITS		NUMBER OF UNITS	STANDBY
LOWER LEVEL FAN COIL UNITS - CRA-FN-1A, 1B, 1C		2	1
UPPER LEVEL FAN COIL UNITS - CRA-FN-2A, 2B, 2C		1	1
LOWER LEVEL RECIRCULATING FANS - CRA-FN-3A, 3B, 3C		3	-
UPPER LEVEL RECIRCULATING FANS - CRA-FN-4A, 4B, 4C, 4D		2	2
CONTAINMENT HEAD AREA RETURN AIR FAN - CRA-FN-5A		1	1

- NOTES:**
- 1- FOR ALL FAN COIL UNITS (FC), THE FILTERS ARE USED ONLY DURING CONSTRUCTION PERIOD.
 - 2- ISOLATION SIGNAL CODES:
A - REACTOR VESSEL LOW WATER LEVEL
F - HIGH DRYWELL PRESSURE
Z - HIGH RADIATION, REACTOR BUILDING VENTILATION SYSTEM
 - 3- FOR FLOW DIAGRAM LEGEND, SYMBOLS AND ABBREVIATIONS, SEE DRAWING M501.
 - 4- ALL INSTRUMENTS ON THIS DRAWING TO BE PREPARED BY "CRA" UNLESS SPECIFICALLY NOTED OTHERWISE.
(E) IS IDENTIFIED AS CRA-FI-2
 - 5- ALL PRESSURE AND FLOW INSTRUMENT ROOT VALVES SHALL BE 4" GLOBE VALVES UNLESS SPECIFICALLY NOTED OTHERWISE.
 - 6- PIPING AND VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS INDICATED BY FLOW DIAGRAM):
A. PIPING AND VALVES WITHIN PRIMARY CONTAINMENT AND UP TO THE OUTERMOST ISOLATION VALVE:
SEISMIC CATEGORY --- I
QUALITY CLASS --- B
CODE GROUP --- B
B. PIPING AND VALVES BEYOND OUTERMOST ISOLATION VALVE (EXCEPT INSTRUMENT LINES AS NOTED):
SEISMIC CATEGORY --- II
QUALITY CLASS --- D
CODE GROUP --- D
C. INSTRUMENT LINES AS NOTED:
SEISMIC CATEGORY --- I
QUALITY CLASS --- B
CODE GROUP --- B
EXCEPT AS NOTED ON M619 INSTRUMENT CONNECTION DIAGRAMS
 - 7- ALL OUTLETS WITHIN THE PRIMARY CONTAINMENT SHALL BE CLASSIFIED AS FOLLOWS:
SEISMIC CATEGORY --- I
QUALITY CLASS --- I
CODE GROUP --- I
DELETED
 - 8- ALL PIPING SYSTEMS IDENTIFIED BY THE PREFIX "P" SHALL BE SUPPLIED AND INSTALLED BY CONTRACT "B23"
 - 9- ALL VALVE TEST CONNECTIONS FOR LINES PENETRATING PRIMARY CONTAINMENT SHALL CONSIST OF 3/4" GLOBE VALVES, WHICH SHALL BE TAGGED AS FOLLOWS:
CSP-V-800 (NUMBER)
CSP-V-800 (NUMBER)
 - 10- RADIATION MONITORING AND SAMPLE HANDLING SYSTEMS (CONTRACT "B23"). VALVES SHALL BE TAGGED AS FOLLOWS:
B. BLOCK VALVE (BHV-X) (PENETRATION NO.)
D. EXCESS FLOW CHECK VALVE.
(B)-EFC-X (PENETRATION NO.)
C. CHECK VALVE (X)-CV-X (PENETRATION NO.)
 - 11- USE PI FOR INSTRUMENT LINES AND PSR FOR SAMPLING LINES.
 - 12- ALL TAGS FOR INSTRUMENT ROOT VALVES WILL BE FURNISHED AND INSTALLED BY OWNER.
 - 13- ALL AIR QUANTITIES INDICATED ARE ACTUAL CFM.
 - 14- SEE M619 SHEET (G) FOR THE CONSTRUCTION DETAILS OF THE QUALITY CLASS II INSTRUMENT AIR SYSTEM.
 - 15- SEE FURNISHED BY CONTRACT "B10" INSTALLED BY OTHERS (CONTRACT "B10")
 - 16- ALL INSTRUMENT LINES ARE DESIGNATED BY TYPE AND LINE NUMBER.
A. EXAMPLE: LINES ORIGINATING INSIDE CONTAINMENT
CRA-FI-1A (LINE NUMBER)
CRA-FI-1A (LINE NUMBER)
B. EXAMPLE: LINES ORIGINATING INSIDE CONTAINMENT
CRA-FI-1A (LINE NUMBER)
CRA-FI-1A (LINE NUMBER)
C. EXAMPLE: CONTINUATION OF THE ABOVE LINE OUTSIDE CONTAINMENT - INDICATED AS FOLLOWS WITH LINE NUMBER NOT SHOWN
CRA-FI-1A (LINE NUMBER)
CRA-FI-1A (LINE NUMBER)

NOTES: CONTINUED

17- BYPASS LEAKAGE TO NON-OPERATING FAN COIL UNITS (AS NOTED BELOW):
A) CRA-FN-1B OR 1C - 2500 CFM
CRA-FN-2A OR 2B - 2500 CFM
CRA-FN-3A, 3B, 3C - 1125 CFM
CRA-FN-4A, 4B, 4C, 4D - 1125 CFM

18- THE BLADE SETTING OF THE FANS SHALL BE AS NOTED BELOW:
CRA-FN-1A (B) (C) - 4.0
CRA-FN-1B (B) (C) - 4.0
CRA-FN-2A (B) (C) - 4.0
CRA-FN-2B (B) (C) - 4.0
CRA-FN-3A (B) (C) - 4.0
CRA-FN-3B (B) (C) - 4.0
CRA-FN-3C (B) (C) - 4.0
CRA-FN-4A (B) (C) - 4.0
CRA-FN-4B (B) (C) - 4.0
CRA-FN-4C (B) (C) - 4.0
CRA-FN-4D (B) (C) - 4.0

FSAR FIG. NO. 9.4-8 (2-10)

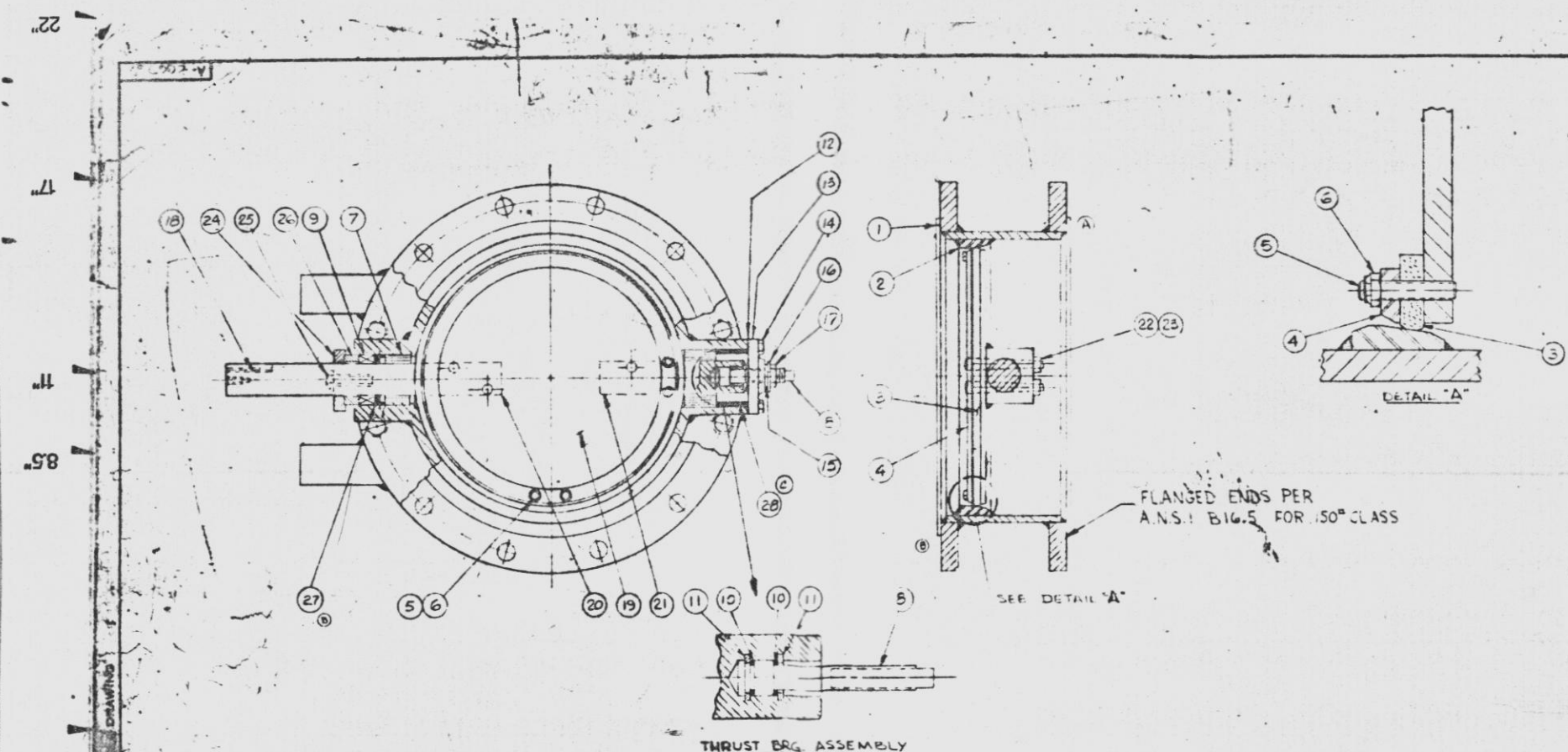
BURNS AND ROE, INC.
ENGINEERS AND ARCHITECTS
ORADCLIFF, N.Y. 10846
FLOW DIAGRAM - REACTOR BLDG.
PRIMARY CONTAINMENT COOLING
AND PURGING SYSTEM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
HARTFORD, CT 06102

DESIGN CONTROL FOR START-UP SYSTEM(S)
7.23
TRANSFERRED TO WPPSS ALL FUTURE CHANGES TO THIS (THESE) SYSTEM(S) SHALL BE INITIATED AND APPROVED BY THE SUPPLY SYSTEM ALL REVISIONS TO THIS DRAWING REQUIRE APPROVAL OF THE SUPPLY SYSTEM AND THE ARCHITECT/ENGINEER.

REVISION	DATE	BY	DESCRIPTION
38	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
39	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
40	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
41	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
42	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
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64	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
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70	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
71	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
72	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
73	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
74	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
75	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
76	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
77	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
78	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
79	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
80	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
81	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
82	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
83	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
84	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
85	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
86	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
87	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
88	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
89	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
90	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
91	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
92	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
93	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
94	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
95	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
96	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
97	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
98	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
99	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE
100	10/1/73	RAM	FOR PREVIOUS REVISIONS SEE PREVIOUS ISSUE

8312300164-10



ITEM	DESCRIPTION	MATERIAL
1	VALVE BODY	STL SA 516 GR 60
2	VALVE BODY SEAT	STL SA 479 GR 304
3	RUBBER SEAT	35 VALVE SEAT WITH DOWNSIDE METAL-GET METAL VALVE SEAT
4	CLAMPING RING	STL SA 479 GR 304
5	CLAMPING RING STUD	18-8 STL
6	CLAMP RING LOCKWASHER	STL SA 479 GR 304
7	SHAFT BEARING	"MC GILL" GR SERIES 6
8	THRUST ADJ. SCREW	STL SA 479 GR 304
9	THRUST ADJ. SCREW	CRANE # 187-1 SQUARE
10	THRUST BEARING	BRONZE ASTM B-36
11	RETAINING RING	ARMCO PH 15-7 MO
12	GASKET	COMPRESSED ASBESTOS PYROLOY
13	THRUST BEARING COVER	STL SA 516 GR 60
14	HEX HEAD SCREW	STL SA 479 GR 304
15	LOCKWASHER	18-8 STL
16	PLAIN WASHER	BRASS
17	HEX NUT	18-8 STL SA 479 GR 304
18	KEY	STL A 1010
19	VALVE DISC	STL SA 516 GR 60
20	VALVE SHAFT FRONT	STL SA 479 GR 304
21	VALVE SHAFT	STL SA 479 GR 304
22	VALVE SHAFT	STL SA 479 GR 304
23	HEX NUT	18-8 STL SA 479 GR 304
24	VALVE FOLLOWER	STL SA 479 GR 304
25	HEX HEAD SCREW	STL SA 479 GR 304
26	STUFFING BOX GUARD	STL SA 479 GR 304
27	STUFFING BOX GUARD	STL SA 479 GR 304
28	SPACER	STL SA 479 GR 304
29	PACKER	STL SA 479 GR 304

THIS VIEW FOR THESE ITEMS ONLY

SGT-V-1A	SGT-V-2A
1B	2B
3A-2	CSP-V-2A
3B-1	2B
3B-2	3A
4A-1	3B
4A-2	4A
4B-1	4B
5A-1	
5A-2	
5B-1	
5B-2	

30	CSP-V-1, CSP-V-2, CEP-V-1A, CEP-V-2A	(4) REQ'D	PRIMARY CONTAINMENT BUTTERFLY ISOLATION VALVES
24	CSP-V-5, CSP-V-6, CSP-V-9	(3) REQ'D	PRIMARY CONTAINMENT VACUUM RELIEF ISOLATION VALVES
24	CSP-V-3, CSP-V-4, CEP-V-3A, CEP-V-4A	(4) REQ'D	PRIMARY CONTAINMENT BUTTERFLY ISOLATION VALVES
18	SGT-V-2A, SGT-V-2B	(2) REQ'D	STANDBY GAS TREATMENT SYSTEM BUTTERFLY VALVES
18	SGT-V-1A, SGT-V-1B, SGT-V-3A, SGT-V-3A-2 (4) REQ'D		
	SGT-V-3B-1, SGT-V-3B-2, SGT-V-4A, SGT-V-4A-2, SGT-V-4B-1, SGT-V-4B-2, SGT-V-5A-1, SGT-V-5A-2, SGT-V-5B-1, SGT-V-5B-2		
SIZE	VALVE TAG NO'S		

A 2. ALL VALVE MATERIAL IS SUITABLE FOR ACCIDENT AMBIENT CONDITIONS AS PER TABLE 7 OF SPEC.

1. VALVES TO BE MANUFACTURED IN ACCORDANCE WITH ASME BOILER/PRESSURE VESSEL CODE, SECTION II CLASS 2, SUBSECTION 1000.

NOTES: UNLESS OTHERWISE SPECIFIED

PRC
APERTURE
CARD

DATE 12/24/66

PRINT RELEASED FOR

WASHINGTON FIELD OFFICE

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RECEIVED

MAR 29 1977

PROJECT NO. 2

WASHINGTON PUBLIC POWER

SYSTEM CONTROL

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THRU

PN-2732-F

SEE LIST

VALVE ASSEMBLY

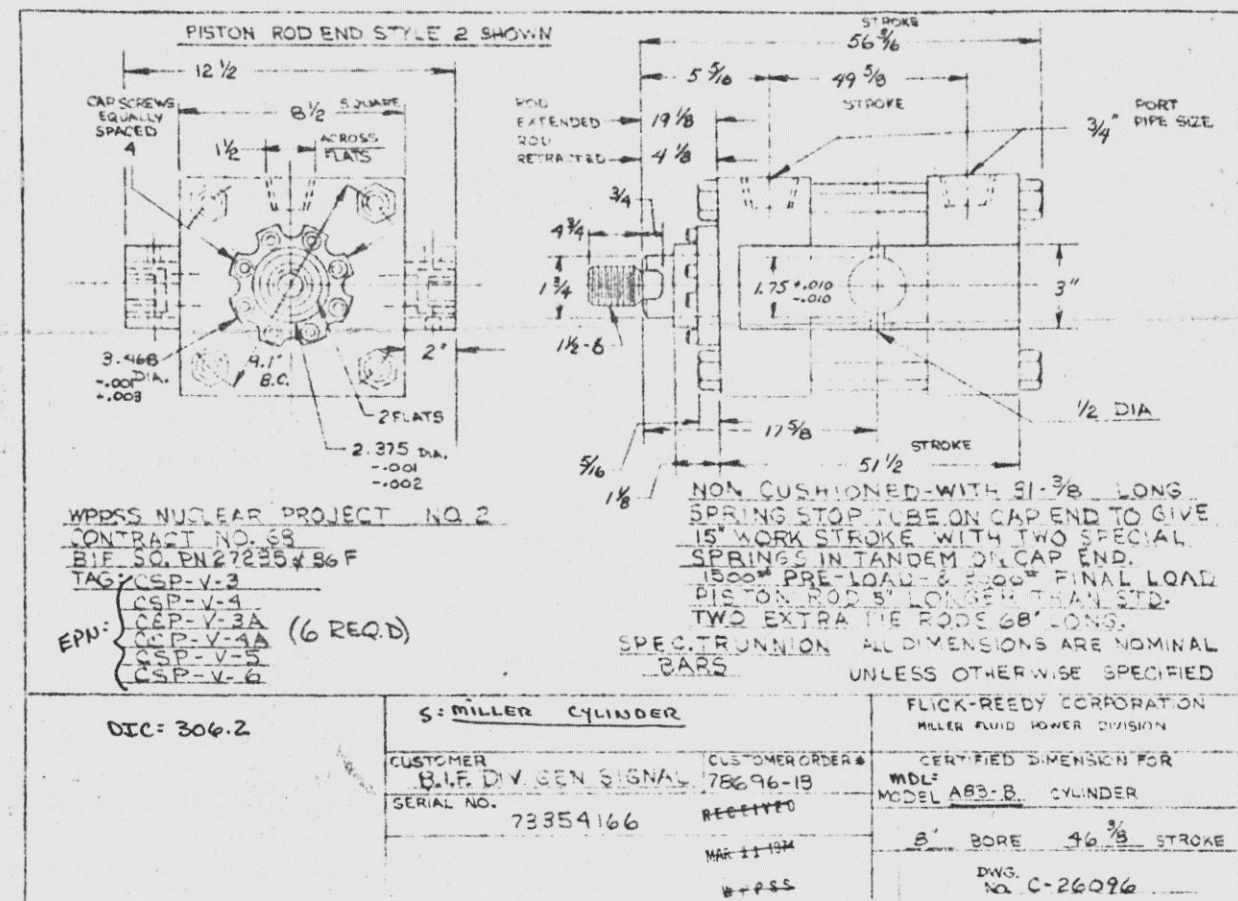
SS. D.

BUTTERFLY VALVE

RED LINE MADE FOR 18-8 STL

SIZE: 18, 24, 30

8312300164-12C



02-68-00 20 1

WASHINGTON PUBLIC POWER SUPPLY SYS.	BRILL 68 00 0035
DATE 2-17-64	

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 CARD

T#4A

8312300164-136

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S- VALVE DATA SHEETS

VALVE DESIGNATION: CSP-V-1 AND -2 } EPN
CEP-V-1A AND -2A }

DWG. A-206763
A-206767
B-206768

DESIGN PRESSURE: 150 PSI
DESIGN TEMPERATURE: 340 DEGREES F
VALVE CLOSING/OPENING TIME: 4 / 4 SECONDS
OPERATOR RESPONSE TIME: 1/2 TO 3/4 SECONDS
WEIGHT OF VALVE AND ACCESSORIES: 1,900 LBS. EACH
CALCULATED PRESSURE DROP THROUGH VALVES AT RATED FLOW FOR ALL BUTTERFLY VALVES: .08 INCHES OF WATER GAGE
FLOW RESTRICTION, K-FACTOR, FULL OPEN, FOR PRIMARY CONTAINMENT VACUUM RELIEF ISOLATION VALVES: 0.27

MANUFACTURER'S DESIGNATION

SIZE: 30" BUTTERFLY VALVE

TRIM MATERIALS: SA 479 GR. 304 ST. STL.

PISTON AREA: 78.5 SQ. IN.

INNER VALVE REMOVAL METHOD: N/A

TOTAL AIR REQUIREMENTS

STEADY STATE 0 SCFM

LOAD CHANGE 57.6 SCFM W/ 70 PSI SUPPLY (A)

OPERATOR CYCLE DESIGN LIFE 4000 MIN. (A)

SOLENOID VALVE CV 2.5 MIN. (A)

INSTRUMENT AIR LINE SIZE 3/4" I.D. MIN. (A)

SOLENOID VALVE MIN. AIR REQUIREMENT IS DEPENDENT ON SOLENOID VALVE SELECTED. (A)

VALVE LEAK RATE: NOT > 90 CC/HR AGAINST DP=45 psig. (A)

CORRECTED PER
B/C COMMENTS
12/15/73 JTC

A UNIT OF GENERAL SIGNAL CORPORATION
PROVIDENCE, RHODE ISLAND, U.S.A.

WASHINGTON PUBLIC
POWER SUPPLY SYSTEM
CONTRACT #68

Frame 1 of 1

D-207110-F

FORM 1162 The Draftboard, Inc.

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NUMBER 68 00 0019

CONTRACT	
WASHINGTON PUBLIC POWER SUPPLY SYS. Hanford No. 2 W. O. 2808	
BURNS AND ROE, INC. ORADELL, N.J. - HEMPSTEAD, N.Y. - LOS ANGELES, CAL.	
REVIEWED AS CHECKED BELOW	
<input checked="" type="checkbox"/> APPROVED FOR FABRICATION A
<input type="checkbox"/> NOT APPROVED BA
<input type="checkbox"/> APPROVED AS NOTED FOR FABRICATION AR
<input type="checkbox"/> RELEASED AS PRELIMINARY INFORMATION P
SUBJECT TO ALL CONTRACTUAL PROVISIONS	
THIS REVIEW DOES NOT IMPLY ACCEPTANCE OF ANY MATERIAL OR EQUIPMENT NOT FULFILLING ALL SPECIFICATION REQUIREMENTS.	
BSS/PA	1/9/74
PROCESSED BY	DATE

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RECEIVED
JAN 17 1974
W.P.P.S.S.

P.R.C.
APERTURE
CARD

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S- VALVE DATA SHEETS

VALVE DESIGNATION: CSP-V-3 AND -4 } EPN
CEP-V-3A AND -4A }

DWG. A-206764
A-206767
B-206768

DESIGN PRESSURE: 150 PSI

DESIGN TEMPERATURE: 275 DEGREES F

VALVE CLOSING/OPENING TIME: 4 / 4 SECONDS

OPERATOR RESPONSE TIME: 1/2 TO 3/4 SECONDS

WEIGHT OF VALVE AND ACCESSORIES: 11,630 LBS. EACH

CALCULATED PRESSURE DROP THROUGH VALVES AT RATED FLOW FOR ALL BUTTERFLY VALVES: .10 INCHES OF WATER GAGE

FLOW RESTRICTION, K-FACTOR, FULL OPEN, FOR PRIMARY CONTAINMENT
VACUUM RELIEF ISOLATION VALVES: 0.27

MANUFACTURER'S DESIGNATION

SIZE: 24" BUTTERFLY VALVE

TRIM MATERIALS: SA479 GR. 304 ST. STL.

PISTON AREA: 50.3 SQ. IN.

INNER VALVE REMOVAL METHOD: N/A

TOTAL AIR REQUIREMENTS

STEADY STATE 2.7 0 SCFM

LOAD CHANGE 36.8 SCFM W/ 70 PSI SUPPLY

OPERATOR CYCLE DESIGN LIFE 4000 MIN.

SOLENOID VALVE Cy 2 MIN.

INSTRUMENT AIR LINE SIZE 3/4" MIN.

SOLENOID VALVE MIN. AIR REQUIREMENT IS DEPENDENT ON SOLENOID VALVE SELECTED.

VALVE LEAK RATE: NOT > 72 CC/HR AGAINST $\Delta P = 45$ psig

NUCLEAR

② CORRECTED PER
THE COMMENTS
12/5/73 JJC

A UNIT OF CENTRAL SIGNAL CORPORATION
PROVIDENCE, RHODE ISLAND, U.S.A.

WASHINGTON PUBLIC
POWER SUPPLY SYSTEM
CONTRACT #68

D-207110-G

Frame 1 of 1

FORM 1162 The Draftboard, Inc.

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BR FILE 68 00 0020
NUMBER

	CONTRACT
WASHINGTON PUBLIC POWER SUPPLY SYS	
Hanford No. 2	
W. O. 2808	
BURNS AND ROE, INC.	
ORADELL, N.J.-HEMPSTEAD, N.Y.-LOS ANGELES, CAL.	
REVIEWED AS CHECKED BELOW	
<input checked="" type="checkbox"/> APPROVED FOR FABRICATION A
<input type="checkbox"/> NOT APPROVED NA
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<input type="checkbox"/> RELEASED AS PRELIMINARY INFORMATION P
<u>SUBJECT TO ALL CONTRACTUAL PROVISIONS</u>	
THIS REVIEW DOES NOT IMPLY ACCEPTANCE OF	
ANY MATERIAL OR EQUIPMENT NOT FULFILLING	
ALL SPECIFICATION REQUIREMENTS.	
BSS / <i>[Signature]</i>	1/9/74
PROCESSED BY	DATE

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9/1/8

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68 00 0021

CONTRACT	
Washington Public Power Supply Sys WPPSS Nuclear Project No 2 W. O. 2808	
BURNS AND ROE, INC. ORADELL, N.J. - NEW STAM, N.Y. - LOS ANGELES, CAL.	
REVIEWED AS CHECKED BELOW	
<input checked="" type="checkbox"/>	Approved for Fabrication
<input type="checkbox"/>	NOT Approved
<input type="checkbox"/>	Approved on notes for Fabrication
See Acceptance Note-Para. 1.2 of Appendix A, Section 1.3	
<input type="checkbox"/>	For Information Only
Subject To All Contractual Provisions	
This Review does not imply acceptance of any material or equipment not full- filling all specification requirements.	
PROCESSED BY	DATE

BSS/LI 5/15/78

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APERTURE
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RECEIVED 8-11-82
R1036106
CYENA RAS

T-2E
C-68

S- VALVE DATA SHEETS

DIC: 709.19

VALVE DESIGNATION: CSP-V-5 AND -6 } EDN
CSP-V-9 }

DWG. A-206765
A-206767
B-206768

DESIGN PRESSURE: 150 PSI

DESIGN TEMPERATURE: 240 DEGREES F

VALVE CLOSING/OPENING TIME: 4 / 4 SECONDS

OPERATOR RESPONSE TIME: 1/2 TO 3/4 SECONDS

WEIGHT OF VALVE AND ACCESSORIES: 1,630 LBS. EACH

CALCULATED PRESSURE DROP THROUGH VALVES AT RATED FLOW FOR ALL
BUTTERFLY VALVES: .10 INCHES OF WATER GAGE

FLOW RESTRICTION, K-FACTOR, FULL OPEN, FOR PRIMARY CONTAINMENT
VACUUM RELIEF ISOLATION VALVES: 0.27

MANUFACTURER'S DESIGNATION

SIZE: 24" BUTTERFLY VALVE

TRIM MATERIALS: SA 479 GR. 304 ST. STL.

PISTON AREA: 50.3 SQ. IN.

INNER VALVE REMOVAL METHOD: N/A

TOTAL AIR REQUIREMENTS

STEADY STATE 0 SCFM

LOAD CHANGE 36.8 SCFM W/ 70 PSI SUPPLY (A)

OPERATOR CYCLE DESIGN LIFE 4000 MIN. (A)

SOLENOID VALVE CV 2 MIN. (A)

INSTRUMENT AIR LINE SIZE 3/4" MIN. (A)

SOLENOID VALVE MIN. AIR REQUIREMENT IS DEPENDENT ON SOLENOID VALVE SELECTED. (A)

VALVE LEAK RATE: NOT > 72 CC/HR AGAINST AP: 45 PSIG (A)

DUPLICATE
ORIGINAL LOST
4-27-78
DIA. NO.

68 00 0021

APPROVED FOR ELECTRICIAN'S 11/16/82	ADDED CSP-V-9 11/16/82	C	D	E	F
WASHINGTON PUBLIC POWER SUPPLY SYSTEM CONTRACT #68		D-207110-H			
A UNIT OF CENTRAL SIGNAL CORPORATION PROVIDENCE, RHODE ISLAND, U.S.A.		The Draftboard, Inc.			

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