MEMORANDUM TO: Tolbert Young, Section Chief, Region V

FROM: Glenn A. Walton, Senior Resident Inspector, BVPS Unit #2

DATE: October 7, 1983

SUBJECT: TEAM INSPECTION - PALO VERDE UNIT 1

Attached is my feeder report covering inspection activities at Palo Verde, Unit 1. The inspection of concrete expansion anchor bolts and embeded plates was a combined inspection and will be written by Mr. Lou Vorderbrueggen. The radiographs that I reviewed will be included in Harry Kerch's report.

I will be on vacation the week of October 11 - 14, 1983. If any questions arise, please call me at my office on October 17th or thereafter at (412) 728-8886.

Glenn A. Walton

Glenn A. Walton

gab

cc: L. E. Tripp, Region 1, w/attach.
W. Albert, Region V, w/attach.
L. Vorderbrueggen, Region V, w/attach.

#26

APPENDIX A

NOTICE OF VIOLATION

Arizona Public Service
Palo Verde, Unit 1

Docket No. 50-528
License No. CPPR-141

10 CFR 50, Appendix B, Criterion IX requires that measures shall be established to assure that special processes including welding are controlled and accomplished in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

Bechtel Drawing Number 13-S-ZAS-536, Revision 3, requires a 5/16 inch fillet weld when attaching structural steel vertical members to horizontal members. Drawing Number 13-C-ZAS-570, Revision 8, requires a 5/16 inch fillet weld when attaching structural steel to embeded plates.

AWS D.1.1 Paragraph 10.17 states that undercut shall be no more than .01 inch deep when its direction is transverse to primary tensile stress in the part that is undercut, not more than 1/32 inch for all other situations.

Contrary to the above, on September 10 and 15, 1983, welds on structural steel were found with fillet sizes less than required by the drawings and welds with undercut were observed which exceeded the requirements of AWS D1.1.

This is a Severity Level IV Violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, Arizona Public Service is hereby required to submit to this office within thirty days of the date of the cover letter to this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending your response time.

APPENDIX A

NOTICE OF VIOLATION

Arizona Public Service
Palo Verde, Unit 1

Docket No. 50-528
License No. CPPR-141

10 CFR 50, Appendix B, Criterion V states "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings . . . and shall be accomplished in accordance with these instructions, procedures, or drawings."

Bechtel specification 13-CM-320, Section 11.0 states, in part "Installation shall be in accordance with AISC Specification for Structural Joints using ASTM-A325 or A490 Bolts."

The specification for Structural Joints using ASTM A325 or A490 Bolts, Paragraph 5(a) requires that A325 bolts, 7/8 inch diameter, be tightened to at least a minimum tension of 39 Kips. An acceptable method of obtaining this tension is described in paragraph 5(e) "Turn-of-Nut Tightening" which requires that bolts br brought to a "snug tight" condition plus an additional 1/3 to 2/3 turn, depending on the bolt length.

Contrary to the above, on September 7 and 13, 1983, four A325 bolts were found finger loose and additional test using a calibrated torque wrench found two A325 bolts with tightness less than the 39 Kips.

This is a Severity Level IV Violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, Arizona Public Service is hereby required to submit to this office within thirty days of the date of the cover letter to this Notice, a writeen statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending your response time.

DETAILS

1. Persons Contacted

R. Forrester, Quality Assurance, Arizona Public Service

C. Collup, Quality Control Engineer, Bechtel

R. Butler, Civil Lead Discipline Engineer, Bechtel

H. Mear, Quality Control Manager, Bechtel

J. Black, Field Engineering Manager, Bechtel

A. Spicer, Records Management, Bechtel

2. Structural Steel

The inspector audited the installed structural steel associated with the High Pressure Safety Injection (HPSI) A train system. The areas inspected are located in the Auxiliary Building and Containment Building. The inspector physically examined welds and bolted connections to ascertain compliance with the below listed applicable documents.

- Specification 13-CM-320 Revision 7 Installation Specification for Erection of Structural and Miscellaneous Steel.
- Structural Welding Code AWD D1.1 1972 with 1973 Revision 1.
- American Institute of Steel Construction AISC - Specification for Structural Joints using ASTM A325 or A490 Bolts.
- Applicable construction drawings.

The matrix below identifies the areas inspected, location, type of inspection and inspection findings.

Inspection Location	Elevation	Amount of Inspection Versus Total Available	Items Inspected	Type Of Inspection	Inspection Findings
Auxiliary Bldg. Pump Room A HPSI	51'6"	15 joints of approx. 30	Bolted Connections	Visual	Four Loose bolts See details below
AD06 Pipe Way Auxiliary Bldg.	51'6"	13 joints of approx. 15	Bolted Connections	Visual	Acceptable
AD06 Pipe Way Auxiliary Bldg.	51'6"	13 joints of approx. 15	Welded Connections	Weld gauge Visual	Six undersize fillet welds See details below
Piping Penetration Area Auxiliary Bldg.	82'-95'	[illegible] joints of approx. 200	Bolted Connections	Visual	Acceptable
Pipe Chase Area Auxiliary Bldg.	88'-	40 joints of approx. 200	Bolted Connections	Visual	Acceptable
Pipe Chase Area Auxiliary Bldg.	88'	50 joints of approx. 200	Welded Connections	Weld gauge Visual	Eight undersize fillet welds, Four welds with undercut. See details below
Containment Bldg.	80'-87'	110 joints of approx. 500	Bolted Connections	Visual	Acceptable
Containment Bldg.	80'-87'	110 joints of approx. 250	Welded Connections	Weld gauge Visual	Acceptable
Auxiliary Bldg. Pump Room A	51'6"	10 bolts of approx. 120	Bolted Connections	Torque Test	Acceptable
AD06 Pipe Way Auxiliary Bldg.	51'6"	28 bolts of approx. 52	Bolted Connections	Torque Test	One bolt turned 60 degree rotation before minimum tightness was achieved. See details below.

Inspection Location	Elevation	Amount of Inspection Versus Total Available	Items Inspected	Type Of Inspection	Inspection Findings
Containment Bldg.	87'	24 bolts of approx. 2500	Bolted Connections	Torque Test	One bolt turned 45 degrees rotation before minimum tightness was achieved. See details below
Containment Bldg.	98'	34 joints of approx. 100	Bolted Connections	Visual	Acceptable
*Containment Bldg.	125'	12 joints	Bolted Connections	Visual	Acceptable
*Containment Bldg.	125'	4 joints	Welded Connections	Weld gauge Visual	Acceptable
*Containment Bldg.	140'	15 joints	Bolted Connections	Visual	Acceptable
*Containment Bldg. Pressurizer Cubicle	-	20 joints	Bolted Connections	Visual	Acceptable
*Auxiliary Bldg. Pump Room B HPSI	51'6"	15 joints	Bolted Connections	Visual	Acceptable

*Items inspected which are not associated with the HPSI Train A system.

Findings:

Bolted Connections

Visual inspections performed in the HPSI Pump Room A found four bolts which were finger loose. The bolts are shown on Drawing 13-C-ZAS-581 Revision 7 and connect the AC-6 platform at the 51'6" elevation. The connections were inspected by Bechtel Quality Control personnel on August 17, 1980, and found acceptable.

Specification 13-CM-320 requires the turn-of-the-nut method be used to obtain a minimum tightness of 39 Kips on an A325, 7/8 inch diameter bolt. To verify whether correct turn-of-the-nut tightness was achieved, the inspector requested the licensee to retorque a sample number of A325 bolts. The contractor used a calibrated torque wrench set at 560 foot pounds. Torque testing of bolted clips to I beams in the Containment Building, AD06 pipe way at AE, 6 foot east of AD, elevation 51'6" found one bolt which required a nut rotation of 60 degrees to achieve the minimum tightness requirements of 39 Kips.

In the Containment Building at 125 degrees aximuth, 10 foot from the liner plate, elevation 88, one bolt is an I beam to I beam connection turned 45 degrees before achieving the minimum tightness.

The loose bolts discussed above were previously inspected and accepted by Bechtel Quality Control personnel.

The installation specification 13-CM-320 Revision 8, for erection of structural and miscellaneous steel, specifies AISC as applicable for structural joints using ASTM-A325 or A490 bolts. Table 3 of this specification requires that 7/8 inch diameter, A325 bolts must be tightened to a minimum tension of 39 Kips.

Failure to achieve the required bolt tightness is a Violation of the installation specification 13-CM-320 and 10 CFR 50, Appendix B, Criterion V. The licensee had commenced corrective actions by issuing a non-conformance report.

All other bolted connections were found acceptable to the applicable acceptance standards.

Welded Connections

In the Auxiliary Building Pipe Chase, elevation 51', the inspector found six fillet welds with undersize leg length and unacceptable undercut. The welds are portions of a W8X31 pipe rack, number 79, fabricated by Marathon Steel Company and shown on Drawing No. 13-S-ZAS-536, Revision 3. In the AD06 pipe way, elevation 51'6", the inspector found six additional fillet welds with undersize leg lengths. The welds are portions of W16X36 I beams clip connections shown on Drawing No. 13-ZAS-500 Revision 10.

The drawings stated above specify a 5/16 inch fillet weld for these connections. The inspector found fillet sizes down to 5/32 inch. The undercut criteria is specified in AWS D1.1 which states, Undercut shall be no more than .01 inch deep when its direction is transverse to primary tensile stress in the part that is undercut, nor more than 1/32 inch for all other situations. Contrary to this requirement, the inspector found undercut of approximately 1/16 inch deep. All other welds inspected were found acceptable to the applicable requirements.

Failure to achieve the required minimum fillet sizes and allowing undercut which exceeds the acceptance standards is a Violation of the applicable drawings, Bechtel Specification 13-CM-320, Revision 8, AWS D1.1 and 10 CFR 50, Appendix B, Criterion IX.

In addition to the inspection associated with the HPSI, Train A system, the inspector randomly selected and inspected 66 bolted and/or welded structural steel connections in the Auxiliary Building and Containment Building. All items were found acceptable to the applicable acceptance standards.

3. Containment Penetrations

Reviews were made of five piping penetrations and one electrical penetration associated with the HPSI Train A system, In addition, one containment pressure, and one spare piping penetration was reviewed.

The review included a walk down of penetrations number 13, 14, 15, 16, 77 (piping), 69 (spare penetration), 62 (containment pressure), and 47 (electrical penetration), to assure the welding was in accordance with ASME, B&PV Code, Section III. In addition, a record review was made to ascertain compliance with the applicable requirements. The inspector verified the below listed attributes were performed in accordance with the requirements. No items of noncompliance were identified.

Penetration Number	Weld Reinforcement	Surface Finish	NDE	Weld Procedure Qualification	Preheat Temp. Maintained	Interpass Temp. Controls	Filler Metal	Weld Checklist	Material Test Report
13	X	X	X	X	X	X		X	X
14	X	X	X	X				X	X
15	X	X	X	X	X	X	X	X	X
16	X	X	X	X	X	X		X	X
77	X	X	X	X	X		X		X
69	X	X	X	X	X		X		
62	X	X	X	X					
47	X	X	X	X					X

Symbols for Joint Types

B — butt joint
C — corner joint
T — tee joint
BC — butt or corner joint
TC — tee or corner joint
BTC — butt, tee, or corner joint

Symbols for Base Metal Thickness and Penetration

L — limited thickness — complete joint penetration
U — unlimited thickness — complete joint penetration
P — partial joint penetration

Symbols for Weld Types

1 — square-groove
2 — single-Vee-groove
3 — double-Vee-groove
4 — single-bevel-groove
5 — double-bevel-groove
6 — single-U-groove
7 — double-U-groove
8 — single-J-groove
9 — double-J-groove

Symbols for Welding Processes, if not Manual Shielded Metal-Arc

S — Submerged Arc
G — Gas Metal-Arc
F — Flux Cored Arc

Fig. 2.6.1—Prequalified joints, method of joint and weld classification

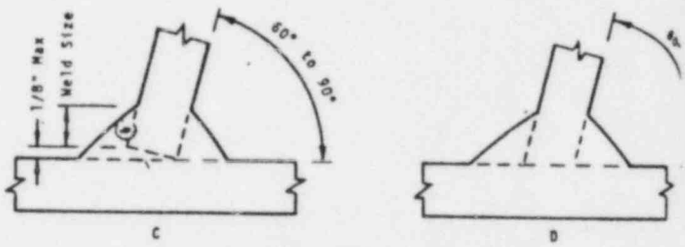


Fig. 2.7.1—Details for fillet welds

2.7.1.1 The minimum fillet weld size, except for fillet welds used to reinforce groove welds, shall be as shown in the following table:

Base Metal Thickness of Thicker Part Joined, in.	Minimum Size* of Fillet Weld, in.
To ¼ inclusive	⅛**
Over ¼ to ½ inclusive	3/16
Over ½ to ¾ inclusive	¼
Over ¾ to 1½ inclusive	5/16
Over 1½ to 2¼ inclusive	⅜
Over 2¼ to 6 inclusive	½
Over 6	⅝

*Except that the weld size need not exceed the thickness of the thinner part joined.
**Minimum size for Bridge applications 3/16 in.

2.7.1.2 The maximum fillet weld size permitted along edges of material shall be:

(1) the thickness of the base metal, for metal less than ¼ in. thick; (See Fig. 2.7.1, Detail A)

(2) 1/16 in. less than the thickness of base metal, for metal ¼ in. or more in thickness, (See Fig. 2.1.1, Detail B) unless the weld is designated on the drawing to be built out to obtain full throat thickness.

2.7.1.3 Fillet welds in holes or slots in lap joints may be used to transmit shear or to prevent buckling or separation of lapped parts. These fillet welds may overlap, subject to the provisions of 2.3.2.2. Fillet welds in holes or slots are not to be considered as plug or slot welds.

2.7.1.4 Fillet welds may be used in skew joints that have an included angle of not less than 60 degrees. (See Fig. 2.7.1, Details C and D)

2.7.1.5 The minimum length of an intermittent fillet weld shall be 1½ in.

2.8 Plug and Slot Welds[5]

2.8.1 Plug and slot welds in lap joints may be used to transmit shear or to prevent the buckling or separation of lapped parts.

2.8.2 The diameter of the hole for a plug weld shall be not less than the thickness of the part containing it plus 5/16 in., preferably rounded to the next greater odd 1/16 in., nor shall it be greater than 2¼ times the thickness of the weld.

2.8.3 The minimum center to center spacing of plug welds shall be four times the diameter of the hole.

2.8.4 The length of the slot for a slot weld shall not exceed ten times the thickness of the weld. The

[5] See Appendix A for the technique of making plug and slot welds.

#34

SI-008-S002

1/16" Pit Problem

Narbut Note

#51

STATUS: AA OD

VENDOR: HBA

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT

NO. PA-7138 PAGE 1 OF ~~2~~ 3

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV.	4. ITEM DESCRIPTION	5. ITEM LOCATION
1	9 9 83	13-P-SIF-201	13	PIPE - 10" SCH/20 - GCBC	AUX BLDG HPSI-'A' EL. 49'-8"

6. Q CLASS	7. STARTUP SYSTEM NO.	8. SERIAL NO.	9. SUBCONTRACTOR/SUPPLIER/BECHTEL	10. P.O. OR SPEC NO.	11. ASME AUTHORIZED INSPECTION REQ'D.
Q/B	1SI-01	1SI-008-S002	BECHTEL	13-PM-204(12)	☒ YES III AS ☐ NO 9/9/83

ITEM	12. DESCRIPTION LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☐ FIELD RECOMMENDED DISPOSITION ☐ ENGINEER DISPOSITION REQ'D. ☒ ENGINEER CONCURRENCE REQ'D.
1	A MECHANICAL INDENTATION HAS BEEN DISCOVERED ON LINE SI-008-S-002 (MAP ATTACHED). THE CIRCULAR INDICATION MEASURES: 1/8" DIA. x 0.059" DEPTH. 10" SCH/20 NOM. WALL = .250 ALLOW. MIN. WALL = .219 CALCULATED WALL = .19[illegible] (INSTRUMENT: STARRETT DIAL INDICATOR DEPTH GAUGE - S/N JGA-0683; RANGE .0005"-.125": CAL. 3-23-83 - 9-23-83)	Use-As-Is	A UT exam has been performed around the circular indication and a min. wall thickness of ~~.256~~ .257" has been found (Note: this is ~~.006~~ .007" above nom. wall). Per engineering calculation ZZ-584 a wall thickness of ~~.197~~ .198 (~~.256~~ .257" - .059") will not affect the integrity or function of the pipe. [signature] 9/9/83 CSB 9/9/83

13. REPORTED BY: E. POLYCHRONIS (BPC 193 QCE)

15. INSPECTION/VALIDATION/REVIEW DATE: [signature] 9/9/83

15A. REPORTABILITY EVALUATION: NOT REPORTABLE: ☒ OR DER NO. ______ REVIEWERS: R/E [signature] QA [signature] DATE [date]

19. ACCEPTANCE OF REWORK/REPAIR
☐ QC ENGR ______ DATE ______ AUTHOR. INSP ______ DATE ______
☐ FIELD ENGR

14. ASSUMED CAUSE OF DISCREPANCY: UNKNOWN

18. DISPOSITION CONCURRENCE
PROJ FIELD ENGR [signature] 9/9/83 DATE — NUCLEAR GROUP SUPV N/A (IF REQUIRED) DATE
GROUP SUPV C.S. Barash 9/9/83 DATE — PROJ ENGR [signature] 9/9/83 DATE
AUTHORIZED INSPECTOR ______ DATE — QA ENGR ______ DATE

INITIATOR E Polychronis DATE 9-9-83

PF-794 (10407) 12/81

~~Please do indepen~~

GEO Construction Testing

FOSTER CITY — MAIN OFFICE 1118 Chess Drive, Foster City, 94404 (415) 573-8000

SI 01

CERTIFIED REPORT of NONDESTRUCTIVE EXAMINATION

CUSTOMER: Bechtel Power Corporation

DATE: 9 19 83

ADDRESS: P.O. Box 49, Palo Verde, Arizona 85343

CONTROL NO. OR REPORT NO: GEO - UT - 1,187

JOB OR PROJECT LOCATION: PVNGS Unit # 1

P.O. NO: 10407-13-MM-501B

PLAN OR DWG. NO: 13PSIF 201 REV. N/A

SURFACE CONDITION: ☐ AS GROUND ☑ AS WELDED ☑ AS FABRICATED

SPECIFICATION: ☑ ASME SECTION III ☐ ANSI B31.1 ☐ AWS D1.1 ☐ _____ OTHER

ACCEPTANCE STANDARD: RECORD ONLY

TYPE OF MATERIAL: S/S

TEMP. OF MAT'L: N/A °F

TYPE OF EXAMINATION: UT ☑ MT ☐ PT ☐

N.D.T. PROCEDURE NO: TMD 1 REV. ____ AMEND. ____

ULTRASONIC EXAMINATION

EQUIPMENT	TRANSDUCER	TEST BLOCK	METHOD USED	SCANNING METHOD	SENSITIVITY LEVEL
PANAMETRICS S/N JJA0066	10 MHZ 1/4" DIA	D301 SS1	DIGITAL READOUT	CONTACT	N/A

MAGNETIC PARTICLE EXAMINATION

EQUIPMENT	DRY ☐ WET ☐	VISIBLE ☐ FLUORESCENT ☐	AC ☐ DC ☐ RECTIFIED ☐	AMPERAGE	POLE/PROD. SPACING HEAD ☐ COIL ☐	PARTICLES — COLOR RED ☐ M-X ____ GREY ☐
N/A						

LIQUID PENETRANT EXAMINATION

☐ Solvent Removable ☐ Post Emulsifying ☐ Water Washable N/A

PENETRANT Brand No.	PENETRANT Batch No.	PENETRANT Dwell Time	CLEANER Brand No.	CLEANER Batch No.	EMULSIFIER Brand No.	EMULSIFIER Batch No.	EMULSIFIER Emuls. Time	DEVELOPER Brand No.	DEVELOPER Batch No.	DEVELOPER Dev. Time	DEVELOPER Dry ☐ Wet ☐ Non-Aqueous ☐

LINE # OR PART #: SI008 S002 10" | AREA EXAMINED: SEE REMARKS | TYPE OF WORK: NEW ☑ REPAIR ☐ | BECHTEL NDE PROCEDURE NO: TMD 1 REV. 0 AMEND. N/A

TYPE OF DEFECTS CODE

C — Cracks P — Porosity NF — Non-Fusion LI — Linear Indication S — Slag LA — Lamination OTHER — Specify

SERIAL # OR WELD #	ACC	REJ	DEF. CODE	REMARKS	SERIAL # OR WELD #	ACC	REJ	DEF. CODE	REMARKS
				SCANNED ENTIRE AREA AROUND INDICATION					
S002	N/A	N/A		MIN READING OBTAINED = .251					
				COUPLANT = CELLULOSE GUM					
				NOM WALL = .250"					
				MIN WALL = .219"					
				NCR PA 7138					

AREA — Aux

NPW

NCR # PA 7138 P. 3 of 3

Technician: John D Brown SNT-TC-1A Level II

Asst Technician: N/A

Customer: acceptable / [illegible] 9/6/83

Witnessed by: NONE SIGNATURE

ENCLOSURE ADDED Yes ☐ No ☑

Page 1 of 1

Walk down bug off Procedure 204

Ñ63032

PALCO VERDE NUCLEAR GENERATING STATION

JOB NO. 10407

PIPING RELEASE FOR INSULATION UNIT NO. 1

QC FIELD INSPECTION REPORT

DATE 11/11/81 RELEASE NO. 301-398

STARTUP SYSTEM 1 S I 0 9

LINE S I 0 0 8

SPOOLS 5001 THRU 5008

VALVES V470 Q SS

	DATE	NAME OF INITIATOR	NAME OF INSPECTOR
CLEANED	11-1-82	RWS	
INSPECTED			BPC 53 NCF 11/14/82
INSULATED	1-31-83	RWS	

Remarks

PALLO VERDE NUCLEAR GENERATING STATION

JOB NO. 10407

PIPING RELEASE FOR INSULATION UNIT NO. 1

QC FIELD INSPECTION REPORT

DATE 11/11/82 RELEASE NO. 301-398

STARTUP SYSTEM | 1 | 5 | F | 6 | 9 |

LINE | S | F | 6 | 0 | 8 |

SPOOLS S001 THRU S008

VALVES V470 Q SS

	DATE	NAME OF INITIATOR	NAME OF INSPECTOR
CLEANED	11-1-82	RWS	
INSPECTED			11/14/82
INSULATED	1-31-83	RWS	

Remarks

INSULATION SERVICES, INC. - JOB 1411
PALO VERDE NUCLEAR GENERATING STATION
10407-13-MM-301 (PO) (SC)

RELEASE NO. 398
LINE NO. SI-008

UNIT NO. 1
SHEET 60 of 103
BILLING NO. 21

RW

MULT.	PIPE SIZE X THICKNESS / DESCRIPTION	10X2 LF/ea	10X2 E.LF	1X2 LF/ea	1X2 E.LF	LF/ea	E.LF	LF/ea	E.LF
---	Pipe	59	59						
X 2	Tee, Cross, Wye, Union, Coup., Cap., Red.		2						
X 3	Elbow & Bend 1.5 Times	4	12						
X 4	Expansion Joints								
X 2	Strainer 1" to 4"								
X 4	" 4" to 10"								
X 8	10" and larger								
X 4	Valve (excludes in line flanges) - All valves except Fl.Bonnet valves 1" to 4"								
X 6	4.5" to 10"								
X 8	12" and larger								
X 5	Valves with flanged bonnet 1" to 4"								
X 7	4.5" to 10"	1	7						
X 9	12" and larger								
X 4	Flanges In line	2	8						
X 4	Equipment nozzle								
X 2	Uncovered								
X 4	Valve								
X 1.5	Stub-ins, bosses & butt-weld Tees W/branches 1.5" NPS + smaller and run of 6" NPS and larger each			2	3				
X 2	Sup. collars and kickbands								
X 1.5	Bevels								
	Other								
	Subtotal ELF		86		3				
	ASME III & H.T.Surcharge		—		—				
	Total ELF		86		3				
	Material unit		7.92		2.75				
	Material price		681.12		8.25				
	Labor unit		8.01		5.22				
	Labor price		688.86		15.66				

CERTIFIED CORRECT:

D.P.C. _____ Date: _____

I.S.I. [signature] Date: 11-23-82

Ref: Dwg. No. SI-201

Insulation: Cal. Sil. ✓ F/G _____

Complete: _____ Partial: ✓

TOTALS THIS PAGE:

MM-301-PO-Material: 689.37

MM-301-SC-Labor: 704.52

ASME Piping - 1.5 —

Heat traced - 1.05 —

Turbine - 1.10 —

LOS ANGELES POWER DIVISION

LARGE PIPE CONTROL CARD

RETENTION TIME 24 YRS

1510085002

SPOOL TAG NUMBER

SIZE	LENGTH	P&ID NO.	COORD	REV.	PROJ CLASS	AREA
					✓	

MAT'L CLASS	S/U SYSTEM	MRR NO.	STORAGE LOC	VENDOR
			Q317290	

RECEIVED	FPT	DATE	INSTALLED	FOREMAN	DATE

ISOMETRIC DWG NO.	REV.	FCR	DCN
	7	NA	NA

TASK NO.	INSPECTION ITEM	AFE	DATE	QCE	DATE
1.0	SPOOL NUMBER MARKING VERIFIED	[signature]	10/10/80	BPC 118 QCE	10/13/80
2.0	CONFIGURATION & ORIENTATION PER ENGR DWG	[signature]	10/10/80	BPC 118 QCE	10/13/80
3.0	ORIENTATION OF FLOW ELEMENTS, ETC.	NA		N/A	
4.0	INTERNAL CLEANLINESS INSPECTION LEVEL: ~~I~~ B (QCH 10/13/80)	[signature]	10/10/80	BPC 118 QCE	10/13/80
5.0	SURFACES FREE OF INJURIOUS DEFECTS	[signature]	10/10/80	BPC 118 QCE	10/13/80
6.0	RECORD NCR & MCN APPLICABLE TO INSTALLATION	NA		N/A	
7.0	INSTALLATION ACCEPTED Q4.1 ①-1 1-51-008-5,002	[signature]	10/10/80	BPC 118 QCE	10/13/80

REMARKS: INFO TRANSFERED FROM SUPPLEMENTARY SHEET DATED 8/28/78 QCH64
F 11-17-80

LAO-0478 12/79

Q4.1 CH-3

PIPE: 10" SCH 20 WELDED SA312 TP304

...ED DATA REPORT

RETENTION TIME ... YRS.

MRR NO. 27964

FORM NPP-1 DATA REPORT FOR FABRICATED NUCLEAR PIPING ASSEMBLIES

(As Required by the Provisions of the ASME Code Rules)

R406D

1. Fabricated by *Pullman Power Products, Paramount, CA (Name and Address of Fabricator) Order No. 2810

2. Fabricated for Bechtel Power Corp., Norwalk, CA (Name and Address) Order No. 10407-13-PM-201

3. Owner Arizona Public Service Co. 4. Location of Plant 3 miles south of Wintersburg, AZ

5. Piping System Identification SAFETY INJECTION (Brief description of intended use, main coolant etc.) Serial No. N-5589-R ✓

Bechtel Dwg.

(a) Drawing No. 13-P-SIF-201 Prepared by Bechtel Power Corp., Norwalk, CA

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2 ✓

Edition 1974, Addenda Date Summer 1975, Case No.

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report NOT APPLICABLE (Name of Part — Item number, Manufacturer's name, and identifying stamp)

7. Shop Hydrostatic Test None psi.

8. Description of piping Inspected 1-Piping Ass'y. Pc. Mk. 1-SI-008-S-002 ✓ (include—mark no.—material spec.—nom. pipe size—schedule or thickness—Length—fittings—flanges, etc.)

Fabrication Drawing F-136R REV.0 "FOR ORIGINAL FABRICATION SEE DATA REPORT SIGNED BY A.N.I. ON 10-18-77 ATTACHED" (SEE ATTACHMENT B)

PIPE: 10" SCH 20 WELDED SA312 TP304

N.D.E.: 100% R.T. GIRTH BUTT WELD

100% L.P. ATTACHMENT WELD

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 4/13/78 Signed *Pullman Power Products (Fabricator) By

Certificate of Authorization Expires 11-18-80 Certificate of Authorization No. N-1926

CERTIFICATE OF SHOP INSPECTION

I, the undersigned holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of and employed by H.S.B.I. & I. Co. of Hartford, Conn. have inspected the piping described in this Data Report on 4/13 1978, and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer make any warranty, expressed or implied concerning the piping in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 5/9 1978 Commissions Ca 1126

(Inspector) National Board, State, Province and No.

*Division of Pullman Incorporated

Q.4.1 CHJ-3

1-SI-008

9. Description of Field Fabrication
-CUT ITEM (2A) AT A POINT 0'7¾" AT A ~~POINT~~ DWG FIELD WELD W-002.
(REFERENCE FULLMAN SHOP DRAWING F-136R, REV. 0) WELD A 0'8¾"
10" DIA. SS PIPE, SCHEDULE 20, SA-312, TP-304, AT CUT POINT WITH FIELD
WELD FW 301. THIS IS IN COMPLIANCE WITH NCR-PA-386 DISPOSITION.
REFER TO NCR- FOR MATERIAL HEAT NUMBER.

10. Field Hydrostatic Test NA psi.

We certify that the field fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE, Class 2, Edition 1974, Addenda Date WINTER 75 Class No. NA

Date 6/25, 1979 Signed BECHTEL POWER CORP. (Fabricator) By Emil A. Kovacevich (Representative)

Our Certification of Authorization to use the NPT Symbol Expires SEPT. 1 19 81
Certificate of Authorization No. N-1917-2

CERTIFICATE OF FIELD FABRICATION INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of ARIZONA and employed by LMCC of ILLINOIS have compared the statements in this Manufacturer's Data Report with the described piping and state that the parts referred to as data items No. 9, not included in the certificate of shop inspection have been inspected by me and that to the best of my knowledge and belief the manufacturer has constructed this piping in accordance with the applicable section of the ASME CODE SECTION III.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the piping described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 6/25 19 79

R J Wohlleben Commissions Az #86
Inspector National Board, State, Province and No.

SEE REIVSED DATA REPORT [illegible] PULLMAN POWER PRODUCTS

RETENTION TIME [illegible] YRS

MRR NO. 2796

R406 ①

FORM NPP-1 DATA REPORT FOR FABRICATED NUCLEAR PIPING SUBASSEMBLIES
(As Required by the Provisions of the ASME Code Rules)

1. Fabricated by Pullman Kellogg, Paramount, CA (Name and Address of Fabricator) Order No. 2810

2. Fabricated for Bechtel Power Corp., Norwalk, CA (Name and Address) Order No. 10407-13-PH-201

3. Owner Arizona Public Service Co. 4. Location of Plant 3 miles south of Wintersburg, AZ

5. Piping System Identification SAFETY INJECTION & SHUTDOWN COOLING Serial No. N-5539 (Brief description of intended use, main coolant etc.)

Bechtel Dwg. R-3

(a) Drawing No. 13-P-SIF-201 Prepared by Bechtel Power Corp., Norwalk, CA

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2

Edition 1974, Addenda Date Summer 1975, Case No. ------

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report NOT APPLICABLE (Name of Part — Item number, Manufacturer's name, and identifying stamp)

7. Shop Hydrostatic Test None psi.

8. Description of piping inspected 1-Piping Ass'y. Pc. Mk. 1-SI-008-S-002 (include — mark no. — material spec. — nom. pipe size — schedule or thickness — length — fittings — flanges, etc.)

Fabrication Drawing F- 136

PIPE: 10" SCH 20 WELDED SA312 TP304

6" SCH 40 SMLS SA376 TP304

PLATE: SA240 TP304 (For Support Attach.)

SA516 Gr. 70 (For Support Attach.)

N.D.E: 100% L.P. ALL ATTACHMENT WELDS

Pullman Power Products
Division of Pullman Incorporated
QVR IDENTIFICATION
2810 F-136
[illegible]

Q4.1(F)-3

1-SI-006

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 10/13/77 Signed Pullman Kellogg (Fabricator) By [signature]

Certificate of Authorization Expires 11/22/77 Certificate of Authorization No. N-776

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of California and employed by D.I.S. of State of CA have inspected the piping described in this Data Report on 10/13/77 and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer make any warranty, expressed or implied, concerning the piping in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 10/13/1977 [signature] (Inspector) Commissions Ca 857 National Board, State, Province and No.

MRR NO. 20043
RETENTION TIME 43 YRS.

R272 (I)

FORM NPP-1 DATA REPORT FOR FABRICATED NUCLEAR PIPING SUBASSEMBLIES

(As Required by the Provisions of the ASME Code Rules)

1. Fabricated by Pullman Kellogg, Paramount, CA (Name and Address of Fabricator) Order No. 2810

2. Fabricated for Bechtel Power Corp., Norwalk, CA (Name and Address) Order No. 10407-13-PM-201

3. Owner Arizona Public Service Co. 4. Location of Plant 3 miles south of Wintersburg, AZ

5. Piping System Identification SAFETY INJECTION & SHUTDOWN COOLING Serial No. N-5589 (Brief description of intended use, main coolant etc.) Bechtel Dwg. P-3

(a) Drawing No. 13-P-SIF-201 Prepared by Bechtel Power Corp., Norwalk, CA

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2

Edition 1974, Addenda Date Summer 1975, Case No. ------

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report NOT APPLICABLE (Name of Part – Item number, Manufacturer's name, and Identifying stamp)

7. Shop Hydrostatic Test None psi.

8. Description of piping inspected 1-Piping Ass'y. Pc. Mk. 1-SI-008-S-002 (include – mark no. – material spec. – nom. pipe size – schedule or thickness – length – fittings – flanges, etc.)

Fabrication Drawing F- 136

PIPE: 10" SCH 20 WELDED SA312 TP304

6" SCH 40 SMLS SA376 TP304

PLATE: SA240 TP304 (For Support Attach.)

SA516 Gr. 70 (For Support Attach.)

N.D.E: 100% L.P. ALL ATTACHMENT WELDS

Pullman Power Products
Division of Pullman Incorporated
QVR IDENTIFICATION
2810 F-136
PER PC. ITEM 19

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 10/18/77 Signed Pullman Kellogg (Fabricator) By A. E. Allison

Certificate of Authorization Expires 11/30/77 Certificate of Authorization No. N-776

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of California and employed by D.I.S. of State of CA have inspected the piping described in this Data Report on 10/18/1977 and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer make any warranty, expressed or implied, concerning the piping in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 10/18/1977

J. Wilson (Inspector) Commissions Ca 857 National Board, State, Province and No.

1-SI-008
Q4:1(H)-3

1. Fabricated by Pullman Power Products, Corporant, CA. Order No. 280
(Name and Address of NPT Certificate Holder)

2. Fabricated for Bechtel Power Corp Norwalk, CA Order No. 6702-13-PP-201
(Name and Address)

3. Owner Arizona Public Service Co. 4. Location of Plant 3 miles south of Wickenburg AZ.

5. Piping System Identification Safety Injection Serial No. N-5589
(Brief description of intended use, main coolant etc.)

(a) Drawing No. Bechtel Drawing 13-P-SIF-2011 Prepared by Bechtel Power Corp. Norwalk, CA

(b) National Board No. N/A

6. Description of Field Fabrication. ISI-008-H003

Weld BB was cut out, C.S. plate item 5 and replaced with, S.S. plate 3/4" x10"x10" SA 240 Gr. TP-304 item 31 welded to item 30 with weld # 3 (shop sheet drawing F-136) work done in compliance with NCR # PA-252.

7. Field Hydrostatic Test N/A psi.

We certify that the field fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE, Class 2, Edition 1974, Addenda Date W 75 Case No. N/A

Date 8 - 8, 19 80 Signed Bechtel Power Corp By Emil A. Kovacevich
(NPT Certificate of Authorization) (Representative)

Our Certification of Authorization to use the NPT Symbol Expires Sept. 1 19 81

Certificate of Authorization No. N-1912-2

CERTIFICATE OF FIELD FABRICATION INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Arizona and employed by I.N.I. of Illinois have compared the statements in this Data Report with the described piping and state that the parts referred to as data items. Number 6, not included in the certificate of shop inspection have been inspected by me and that to the best of my knowledge and belief, the NPT Certificate Holder has constructed this piping in accordance with the applicable section of the ASME CODE SECTION III.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the piping described in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date Aug 13 1980

Robert C. Koches Commissions Arizona 124
Inspector National Board, State, Province and No.

REV. 7

PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2 & 3
RECEIVING INSPECTION PLANNING FOR
PERMANENT PLANT ITEMS
JOB NO. 10407

QP/P/QC NO. 4.0

9. TASK NO.	10. DESCRIPTION	11. INSPECTION METHOD	12. QCE ACCEPT.	13. DATE
5.0	EXCEPTIONS:		N/A	
5.1	NO EXCEPTIONS NOTED ITEM(S) RELEASED FOR STORAGE OR INSTALLATION.	VERIFY		
5.2	INDICATE EXCEPTIONS IN REMARKS SECTION RECORD NCR NO _____ OR DDN NO R-699 ITEM(S) TAGGED AND PLACED ON HOLD PENDING COMPLETION OF RECEIVING INSPECTION.	VERIFY		5-9-78
5.3	INDICATE EXCEPTIONS IN REMARKS SECTION RECORD NCR NO. _____ ITEMS TAGGED AND CONDITIONALLY RELEASED FOR INSTALLATION.	VERIFY	N/A	

14. REMARKS:

1. DDN R-699- DOCUMENTATION.

2. THIS RIP & DOCUMENTATION IS FOR PIPE SPOOL 136-R MK # 1-SI-008-S-002 ONLY.

EXHIBIT 4.0-1 (back)

15. COMPLETED PACKAGE REVIEWED AND ACCEPTED PQCE Allen E. Moore DATE 6/2/78

PP-1324.1 (10407) 1/78

RETENTION TIME 4 YRS.

MRR No. 27904

R4060①

EXHIBIT 5A-2

[READ INSTRUCTIONS BEFORE FILLING IN FORM]

[illegible]

1 Document Category Number	2 Specification Paragraph Reference	3 Type of Copies	4 Drawings & Data (Initial / Final)	5 Prior Approval Required (Yes / No)	6 Quantity Required for Release	7 Distribution Code	8 Type of Conformance Check	9 Inspection Release	10 Engineering Review	11 Field QCE Check-In	12 Remarks
12.0	4.6.5.1	Reproducible / Microfilm			1	b	*	GBH		QCE	* SEE QAR-3
12.0	4.6.5.3	Reproducible / Microfilm			1	b	*	GBH		QCE	* SEE QAR-5
13.0	4.6.3.9	Reproducible / Microfilm			1	b	*	GBH		QCE	* SEE QAR-2
14.0	4.6.6.4	Reproducible / Microfilm					N/A	GBH			
14.0	4.4.2.3	Reproducible / Microfilm			1	b	N/A	GBH		QCE	Verification Reports
15.0	4.12.1	Reproducible / Microfilm	NOT USED		1	b	1	GBH			
16.0	4.15.3d	Reproducible / Microfilm			1	b	N/A	GBH		QCE	* SEE QAR-1-C
17.1	4.4.1.2	Reproducible / Microfilm					*	GBH		QCE	* SEE QAR-1-C
17.1	4.15.3c	Reproducible / Microfilm			1	b	*	GBH			
17.2	4.9.2.2	Reproducible / Microfilm			1	b	N/A	GBH		QCE	Ferrite Data Report
17.3	4.6.3.7	Reproducible / Microfilm			1	b	*	GBH			* FOR WELD MATERIAL SEE QAR-2

13. Supplier's Order No. 2810	14. Supplier's Part No. SEE PAGE 3 of 3	15. Supplier's Part Name PIPE SPOOLS	18. Quantity 1
17. Buyer's Req. Item No. ITEM 2	18. Buyer's Line/Equip. Tag or Code No. SEE PAGE 3 of 3	19. Buyer's Part Name PIPE SPOOLS	20. Traceability RELEASE 39 SEE PAGE 3 of 3

21. Supplier's Conformance Statement — We certify that the listed work and required documents meet the requirements of the procuring documents. Supplier [signature] Title: Q.A. ENGINEER Date: 4/13/78

Authorized Deviations: ☐ YES Noted under 12. Remarks ☑ NONE

22. Inspection Release Statement — Work was released based on satisfactory completion of inspection and review of documentation. Bechtel Inspector: [signature] FOR G. WALDROP Date: 4-13-78

23. Engineering Review Statement — The Quality Verification Documents submitted to Engineering with this form have been reviewed for conformance to the specification requirements and are acceptable. Engineer: ________ Date: ________

24. QCE Check-In Statement — This form and the Quality Verification Documents referenced herein have been received and checked and are verified. QCE: Glenn E. White CONTROLLED FILED (QCE) Date: 5-9-78

After QCE Check-In Distribute to: Requirement Manager, Field Office Manager, Material Supervisor

PALO VERDE NUCLEAR GENERATING STATION
UNITS 1, 2 AND 3

QUALITY VERIFICATION DOCUMENT REQUIREMENTS

Job No. 10407
Spec Number 13-PM-201
Sheet 1 of 3 Rev. 1

G-321-D

QUALITY VERIFICATION DOCUMENT TRANSMITTAL

RETENTION TIME __ YRS.

MRR NO. 27964

EXHIBIT 5A-2

R406 ①

READ INSTRUCTIONS BEFORE FILLING IN FORM

1 Document Category Number	2 Specification Paragraph Reference	3 Kind of Copies	4 Quantity Required	5 Approval Return	6 Quantity Required for Release	7 Distribution Code	8 Supplier Check	9 Inspection Release	10 Engineering Review	11 Field QCE Check In	12 Remarks
17.4	4.15.3f	Reproducible / Microfilm					*	[initials]			* SEE QAR-1-c
	4.17	Reproducible / Microfilm			1	b	3	[initials]			
18.0	4.2.4	Reproducible / Microfilm			1	b	4	[initials]			
19.0	4.15.3.a	Reproducible / Microfilm			1	b	N/A	[initials]			INCLUDES 1 PACKAGE OF FILM
20.0	4.15.3b	Reproducible / Microfilm			1	b	1	[initials]			
21.0	4.15.3a	Reproducible / Microfilm			1	b	N/A	[initials]			
22.0	4.15.3a	Reproducible / Microfilm	NOT USED		1	b	1	[initials]			
24.0	4.9.1.1	Reproducible / Microfilm			1	b	N/A	[initials]			
25.0	4.11	Reproducible / Microfilm			1	b	2	[initials]			

13. Supplier's Order No.	14. Supplier's Part No.	15. Supplier's Part Name	16. Quantity
2810	SEE PAGE 3 of 3	PIPE SPOOLS	1
17. Buyer's Req. Item No.	**18. Buyer's Line/Equip. Tag or Code No.**	**19. Buyer's Part Name**	**20. Traceability**
ITEM 2	SEE PAGE 3 of 3	PIPE SPOOLS	RELEASE 39 SEE PAGE 3 of 3

21. Supplier's Conformance Statement — We certify that the listed work and required documents meet the requirements of the governing documents. Supplier: [signature] Title: Q.A. ENGINEER Date: 4/13/78

Authorized Deviations ☐ YES Noted under 12. Remarks ☒ NONE

22. Inspection Release Statement — Work was released based on satisfactory completion of inspection and review of documentation. Bechtel Inspector: [signature] FOR G. WALDROP Date: 4-13-78

23. Engineering Review Statement — The Quality Verification Documents submitted to Engineering with this form have been reviewed for conformance to the specified requirements and are acceptable. Engineer: ______ Date: ______

24. QCE Check In Statement — CONTROL NO. / FILE NO. — QCE: Glenn C. White Date: 5-9-78

After QCE Check In Distribute to: Procurement Manager, Field Office Manager, Material Supervisor

PALO VERDE NUCLEAR GENERATING STATION
UNITS 1, 2 AND 3

QUALITY VERIFICATION DOCUMENT REQUIREMENTS

JOB NO. 10407 | PO/SPEC NUMBER 13-PM-201 | SHEET 2 OF 3 | REV 1

G-321-D

QUALITY VERIFICATION DOCUMENT TRANSMITTAL

RELEASE: 39

JOB NO.: 2810

Form QAP 6.321 ?

R4060 ①

RETENTION TIME 1 YRS.

MBR NO 27964

PULLMAN POWER PRODUCTS
F-SHEET NUMBER

F- 136R

BECHTEL PIECE
MARK NUMBER

1-SI-008-S-002

Pullman Power Products Verification

[signature]
Signature

Q.A. ENGINEER
Title

4/13/78
Date

Bechtel Verification

[signature] FOR G. WALDROP
Signature

SQR
Title

4-13-78
Date

Pullman Power Products

RELEASE: 39

DATE: 4/13/78

JOB NO.: 2810

R406(1)

MRR NO. 27964

RETENTION TIME ___ YRS.

INSPECTION VERIFICATION REPORT

All pipe spools inspected in accordance with approved Pullman Power Products procedures and procurement documents. Inspection signed off on shop traveler by Pullman Power Products and Bechtel Inspector. Traveler on file for review.

Verification Inspection by Pullman Power Products Quality Assurance.

D.M. Pelac
Signature

Q.A. ENGINEER
Title

4/13/78
Date

Verification Inspection by Bechtel.

C.E. Hunt
Signature

SQR
Title

4-13-78
Date

RETENTION TIME 1Z YRS.

* REWORK FOR DOC. SEE TRAVELER 2810 F-136. MRR NO. 27964

QUALITY VERIFICATION DOCUMENTATION LIST
NUCLEAR PIPING SUB-ASSEMBLIES
Records and/or Reports which apply [illegible] to an individual piece

Pullman Power Products
Division of Pullman Incorporated R1060(1)
Page 1 of 3

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
BECHTEL P.O. No. 10407 13 [illegible] PM 201

BY MJ
DATE
NO. F- 136 R
JOB NO. 2810
PIECE MARK 1-51-008-S-002

BECHTEL ITEM NO. 2

QUALITY PROGRAM DOCUMENTATION

MATERIALS	DOC CODE	SPEC PARAGRAPH	Form 1 Sheet Per No. * 1	1A	* 2	Material Identification
Certified Chemical and Mechanical Properties	Note A	4.15.3	X	X	X	
Impact Test Report Materials	Note A	4.9.2.2				
Manufacturer's Cert. of Compliance	Note A	4.17				
Manufacturer's Partial Data Report	Note A	4.15.2				
P.T. Report Materials	Note A	4.15.3				
M.T. Report Materials	Note A	4.15.3				
Radiographic Film Materials		4.8.2.1.2				
Ultrasonic Exam. Report - Materials	Note A	4.15.3	X	X		
Report of Vendor's Wld. Repair Weld	Note A	4.15.3				
P.T. or M.T. Report Vendor Repair Weld	Note A	4.15.3				
Radiographic Report Vendor Repair Weld	Note A	4.15.3				
Stress Relief of Vendor Repair Weld	Note A	4.15.3				
Test Report Weld Wld. Repair Weld	Note A	4.15.3				
Deviation Requests and Resolution		4.15.2				

Note A - No transmittal - Appears by reference on the "as built" F Sheet
Note B - No transmittal - A QC Inspection Tool only.
Note C - Appears by reference on QC History Record

REVISED 12/1/78

RELEASED FOR SHIPMENT
Pullman Power Products
By [signature] Date 4/13/78

SHOP INSPECTION
BECHTEL POWER CORPORATION
By [signature]
Title SQR Date 4/13/78

RETENTION TIME __ YRS.

* REWORK FOR DOC. SEE TRAVELER 2810 F-136 ..

QUALITY ... TION DOCUMENTATION LIST
... PING SUB ASSEMBLIES
... which apply to an individual piece

Pullman Power Products
Division of Pullman Incorporated

Page 2 of 3

... LIC SERVICE COMPANY
... CLEAR GENERATING STATION
P.O. No. 10407-13-PM 201

BY M J   L406 (1)

DWG NO. F-136 R   JOB NO 2810

PIECE MARK 1-SI-008-5-002

BECHTEL ... 2

QUALITY ... DOCUMENTATION

OPERAT... IDENTI... THE MA...	DOC CODE	SPEC PARAGRAPH	*1	1A						
Transfer ... Identific...		NA-2766.6 (a) (3)	X	X						
Bending Report	Note B	4.5.6.7								
Post ... Report	16	4.15.2								
Post B... Report	Note B									
U.T. Rep... After Be...	19	4.8.2.5.2								
P.T. R... after H...	22	4.5.6.8								
Report of Pullman F... Material P...	14	4.4.2.3								
Weld Dat... Material R...	Note C	4.4.2.3								
P.T. or M... Material...	14	4.4.2.3								
Radiog... Report o...	14	4.4.2.3								
Local St... of Mater...	14	4.4.2.3								

From F Sheet Item No. — Material Identification

BECHTEL
250

ITEMS ON A PER PIECE BASIS			DOC. CODE	SPEC. PARAGRAPH
Full Furn... Report of			16	4.15.3d
Weld Hist...	X	(initials)	12-13-14	4.6.4.7. & 4.9
Delta Fer...			17	4.6.3.7
Cleaning ... $ 150 Report of	X	(initials)	15	4.4.4.3.8
O.D. P...			Note B	
O.D. Pa...			Note B	
Repai... ...t of	X	(initials)	Note B	
Ship S...	X	(initials)		
... Report	X	(initials)	18	4.2.4
...	X	(initials)	25	4.1.7 & 4.11

REVISED 1-20-77

Mark items required
Initial when complete

RETENTION TIME 1 YR

NSR No. 22964

QUALITY VERIFICATION DOCUMENTATION LIST
NUCLEAR PIPING SUB ASSEMBLIES
Records and/or Reports which apply to an individual piece

Pullman Power Products
Division of Pullman Incorporated

P406

Page 3 of 3

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
BECHTEL P.O.No. 10407-13 PM 201

By M J

DWG NO F-136R JOB NO 2510

PIECE MARK 1-51-008-S-002

BECHTEL ITEM NO 2

QUALITY PROGRAM DOCUMENTATION

From P Steel Weld

77 37

REVISED 1/26/78

WELDS	DOC CODE	SPEC. PARA.	A	B	C	D	E	F	G	H
P.T. or M.T. Report Preparation for Weld	Sect. III NB (NC) - 5130									
Weld Data Report	Note C				X	X				
Local Stress Relieve Chart	16	4.15. 3d								
P.T. or M.T. Report	21 22	4.15. 3a				X				
Radiographic Report	20	4.15. 3b			X					
Radiographic Films		4.5 2.3			X					
Weld Material Qualification	Note C									
Weld Data Report Weld Repair	Note C									
Local Stress Relieve Chart of Weld Repair	16	4.6.6								
P.T. or M.T. Report of Weld Repair	21 22	4.6.6								
Radiographic Report of Weld Repair	20	4.6.6								
Radiographic Films of Weld Repair		4.6.6								
Deviation Requests And Resolution		4.15.2								

BECHTEL
250

RETENTION TIME 1C YRS

Pullman Power Products
Division of Pullman Incorporated

MRR NO. 27964
R4060 ①

LIQUID PENETRANT INSPECTION RECORD

DATE 4-13-78

JOB NO 2810

"I" NO. 136

PIECE NO. 1-51-008-S-002

MATERIAL S/S

EXAMINATION PROCEDURE JSQ04 Rev.0

ACCEPTANCE CRITERIA JSQ04 Rev.0

BRAND NAME AND TYPE OF:		BATCH NO. OF:	
PENETRANT	SPOT CHECK	PENETRANT	7D073
CLEANER	" "	CLEANER	7K001
DEVELOPER	" "	DEVELOPER	7K054

CHEMICAL ANALYSIS CERTIFICATION OF TEST COMPONENTS ATTACHED.

RECORD OF EXAMINATION RESULTS

Accept Weld D

BECHTEL
250

NAME OF INSPECTOR George Trumbull

SNT-TC-1A LEVEL II

RECORD OF RE-EXAMINATION

NAME OF INSPECTOR

SNT-TC-1A LEVEL

RETENTION TIME 4 YRS.

MRR NO. 27964

77 37 3

REVISED 1/26/78

WELD HISTORY RECORD

Page 1 of 1

WELD FROM F SHEET	WPS IN QAR 3 (IS NO.)	WMQR NO IN QAR 2	WELDER OR WELDING OPERATOR SYMBOL
C	803	118-1	JS R406 ①
	803	118-1	M
	805	176-1	M
D	803	118-1	B

BECHTEL
250

Pullman Power Products
Division of Pullman Incorporated

QA JML	JOB NO. 2810
PIECE MARK 1-SI-003-S-002	
DATE 4-13-78	DWG NO F - 1368

RETENTION TIME 15 YRS.

MRR NO. 27964

VISUAL INSPECTION
FINAL INSPECTION CHECKLIST

R406 (1)

JOB NO 2810

PIECE NO 1-SW-002-S-002 .245 .247

SHEET NO 136R

CHECK POINTS		YES	NO	N.A.	COMMENTS
ALL PRIOR OPERATIONS HAVE BEEN PERFORMED AND APPROVED AND SIGNED OFF ON THE TRAVELER		/			
SPECIFIED MATERIALS HAVE BEEN INSTALLED IN THE PIPING SUB-ASSEMBLY		/			
ALL STAMPING DISPLAYED ON THE PIPING SUB-ASSEMBLY IS ACCURATE AND CORRESPONDS WITH THE INFORMATION PRESENTED ON THE FABRICATION SHEET		/			
FINAL DIMENSIONAL EXAMINATION HAS BEEN PERFORMED AND THE DIMENSIONAL INFORMATION HAS BEEN RECORDED ON THE FABRICATION SHEET		/			
CLEANING HAS BEEN PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNING SPECIFICATION		/			
WELDER SYMBOLS AND RADIOGRAPHIC POINT LOCATIONS HAVE BEEN ACCURATELY APPLIED AND ARE COMPLETE		/			
CONTOUR, FINISH, AND HEIGHT OF WELD CROWN COMPLIES WITH THE REQUIREMENTS OF THE GOVERNING SPECIFICATION.		/			
ALL ACCESSIBLE INSIDE WELD BEADS HAVE COMPLETE JOINT PENETRATION AND ARE FREE FROM UNDERCUTTING		/			
FIELD WELD END PREPS ARE MACHINED TO THE CONFIGURATION AND TOLERANCES DICTATED ON THE MACHINING SKETCH.		/			
PIPING SUB-ASSEMBLY IS FREE FROM DAMAGE, EXCESSIVE PITTING, AND UNACCEPTABLE SURFACE DEFECTS.		/			
ASSEMBLY HAS BEEN INSPECTED AND APPROVED BY THE AUTHORIZED INSPECTOR AND/OR THE CUSTOMERS SURVEILLANCE REPRESENTATIVE.		/			BECHTEL 250
THE APPROPRIATE CODE STAMP HAS BEEN APPLIED.		/			
ASSEMBLY HAS BEEN CAPPED, PAINTED, AND IDENTIFIED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNING SPECIFICATION.		/			

Pullman Power Products
Division of Pullman Incorporated

INSPECTED BY George [illegible]

APPROVED [illegible signature]

DATE 4-13-78

REVISED DATA REPORT

RETENTION TIME LT

FORM NPP1 DATA REPORT FOR FABRICATED NUCLEAR PIPING SUBASSEMBLIES

(As Required by the Provisions of the ASME Code Rules)

VPP NO. 279

1. Fabricated by *Pullman Power Products, Paramount, CA (Name and Address of Fabricator) Order No. 2810 RY06C

2. Fabricated for Bechtel Power Corp. Norwalk, CA (Name and Address) Order No. 10407 13 PM 201

3. Owner Arizona Public Service Co. 4. Location of Plant 3 miles south of Wintersburg, AZ

5. Piping System Identification SAFETY INJECTION (Brief description of intended use, main coolant etc.) Serial No. N 5589-R

(a) Drawing No. Bechtel Dwg 13-P-SIF-201 Prepared by Bechtel Power Corp. Norwalk, CA

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2

Edition 1974, Addenda Date Summer 1975, Case No.

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report NOT APPLICABLE (Name of Part — Item number, Manufacturer's name, and identifying stamp)

7. Shop Hydrostatic Test None psi.

8. Description of piping inspected 1 Piping Ass'y Pc Mk 1-SI-008-S-002 (Include: mark no.—material spec.—nom. pipe size—schedule or thickness—Length—fittings—flanges, etc.)

Fabrication Drawing F-136R REVO FOR ORIGINAL FABRICATION SEE DATA REPORT SIGNED BY A.N.I. ON 10-18-77 ATTACHED" (SEE ATTACHMENT B)

PIPE: 10" SCH 20 WELDED SA312 TP304

N.D.E.: 100% R.T. GIRTH BUTT WELD

100% L.P. ATTACHMENT WELD

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 4/13/78 Signed *Pullman Power Products (Fabricator) By J.M. Palac

Certificate of Authorization Expires 11-18-80 Certificate of Authorization No. N-1926

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by H.S.B.I. & I. Co. of Hartford, Conn. have inspected the piping described in this Data Report on 4-13 1978, and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code, Section III.

By signing this certificate, neither the Inspector nor his employer make any warranty, expressed or implied concerning the piping in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 5-9-78 L.E. DeRa (Inspector) Commissions CA 1126 National Board, State, Province and No.

*Division of Pullman Incorporated

RETENTION TIME LT YRS

SEE REVISED DATA REPORT PULLMAN POWER PRODUCTS

MDR NO. 27964

R406D

SUPPLEMENTARY DATA REPORT FOR ASSOCIATED NUCLEAR PIPING SUBASSEMBLIES

(As Required by the Provisions of the ASME Code Rules)

1. Manufactured by Pullman Kellogg, Paramount, CA (Name and Address of Fabricator) Order No. 2810

2. Installed by Bechtel Power Corp., Norwalk, CA (Name and Address) Order No. 10407-13-PH-201

3. Owner Arizona Public Service Co. 4. Location of Plant 3 miles south of Wintersburg, AZ

5. Piping System Identification SAFETY INJECTION & SHUTDOWN COOLING (Brief description of intended use, main equipment, etc.) Serial No. N-5228

(a) Drawing No. Bechtel Dwg. F-3 13-P-SIF-201 Prepared by Bechtel Power Corp., Norwalk, CA

(b) National Board No. N/A

6. The material, design, construction, and workmanship complies with ASME Code Section III, Class 2

Edition 1974, Addenda Date Summer 1975, Case No. ------

Remarks: Manufacturers' Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report NOT APPLICABLE (Name of Part – Item number, Manufacturer's name, and Identifying stamp)

7. Shop Hydrostatic Test None psi.

8. Description of piping inspected 1-Piping Ass'y. Pc. Mk. 1-SI-008-S-002 (Include – mark no. – material spec. – nom. pipe size – schedule or thickness – length – fittings – flanges, etc.)

Fabrication Drawing F- 136

PIPE: 10" SCH 20 WELDED SA312 TP304

6" SCH 40 SMLS SA376 TP304

PLATE: SA240 TP304 (For Support Attach.)

SA516 Gr. 70 (For Support Attach.)

N.D.E: 100% L.P. ALL ATTACHMENT WELDS

Pullman Power Products
Division of Pullman Incorporated
QVR IDENTIFICATION
2810 F-136
PIPE TO WELD

We certify that the statements made in this report are correct and that the fabrication of the described piping conforms with the requirements of SECTION III of the ASME BOILER AND PRESSURE VESSEL CODE.

Date 10/13/77 Signed Pullman Kellogg (Fabricator) By [signature]

Certificate of Authorization Expires 11/30/77 Certificate of Authorization No. N-776

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of California and employed by D.I.S. of State of CA have inspected the piping described in this Data Report on 10/13/77 and state that to the best of my knowledge and belief, the Manufacturer has constructed this piping in accordance with the applicable Subsections of ASME Code Section III.

By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the piping described in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 10/13/77 Signed [signature] Commissions CA 857 National Board, State, Province, and No.

(Inspector)

RETENTION TIME LT YRS.

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT

NO PA-386 PAGE 1 OF 2

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV.	4. ITEM DESCRIPTION	5. ITEM LOCATION
1	2 20 79	13-P-SIF-201	6	Pipe Spool	AUX. BLDG.

6. Q CLASS	7. STARTUP SYSTEM NO.	8. SERIAL NO.	9. CONTRACTOR/SUPPLIER	10. P.O. OR SPEC NO.	11. ASME AUTHORIZED INSPECTION REQ'D.
Q	SI	1-SI-008-S006	Bechtel/Pullman	13-PM-201-5 13-PM-204-5	☒ YES ☐ NO

ITEM	12. DESCRIPTION (LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION)	18. FIELD ENGR DECISION	19. ☒ FIELD RECOMMENDED DISPOSITION ☐ ENGINEER CONCURRANCE REQ'D
1	DWG. 13-P-SIF-201 REV. 6 SHOWS CENTER LINE OF HPSI PUMP SIA-P02 SUCTION NOZZLE TO BE AT E. 3002'-0". THE CENTER LINE OF SPOOL 1-SI-008-S006 IS E. 3001'-11". FLANGES HAVE A 1" MISMATCH.	1, & 2. REWORK	1. & 2. CUT A 7 3/4" SECTION FROM SPOOL 1-SI-008-S002 AT POINT INDICATED ON SKETCH & REPLACE WITH AN 8 3/4" LONG, 10" Ø, S/20 S.S., SA-312, GR. TP-304 PUP. REWELD & USE W-002C. RECORD HT # 836905
2	SPOOL 1-SI-008-S002 DOES NOT CONFORM TO SPEC. 13-PM-~~204~~ 201 REV. 5 PARA. ~~5.7~~ 4.5.8 (AAT 2-21-79), WHICH ALLOWS A ± 3/8" DIMENSIONAL TOLERANCE. THE SPOOL MEASURES 18'-8 1/2", IT SHOULD BE 18'-9".	2. REWORK	Q.C. VERIFY [QCE stamp] 6/12/79 STAMP / DATE WELD PROCEDURE & N.D.E. TO BE PER LATEST REVISION OF FORM 84.

13. REPORTED BY: C. Kim

15. INSPECTION/VALIDATION/REVIEW DATE: J E Stanley 2/21/79

17. PROJ. FLD. ENGR. REVIEW: [signature] 2/21/79

20. TWX/TELECON REFERENCE REPAIR/USE-AS-IS: NA — EGS/PE

22. ACCEPTANCE OF NEW WORK/REWORK/REPAIR — QC ENGR [signature] DATE 6/12/79 — AUTHOR. INSP R J Wohlleben 6/12/79

21. DISPOSITION CONCURRANCE — PROJ. FIELD ENGR. [signature] 2-21-79 — NUCLEAR GROUP SUPV. (IF REQUIRED) NA — GROUP SUPV. NA — PROJ. ENGR. NA — AUTHORIZED INSPECTOR R J Wohlleben 2/21/79 — QA ENGR J. E. [signature] 2-22-79

14. CAUSE OF DISCREPANCY

1. ACCUMULATION OF INSTALLATION TOLERANCES & VENDOR ERROR.
2. VENDOR ERROR

INITIATOR A. G. Tomson DATE 2-21-79

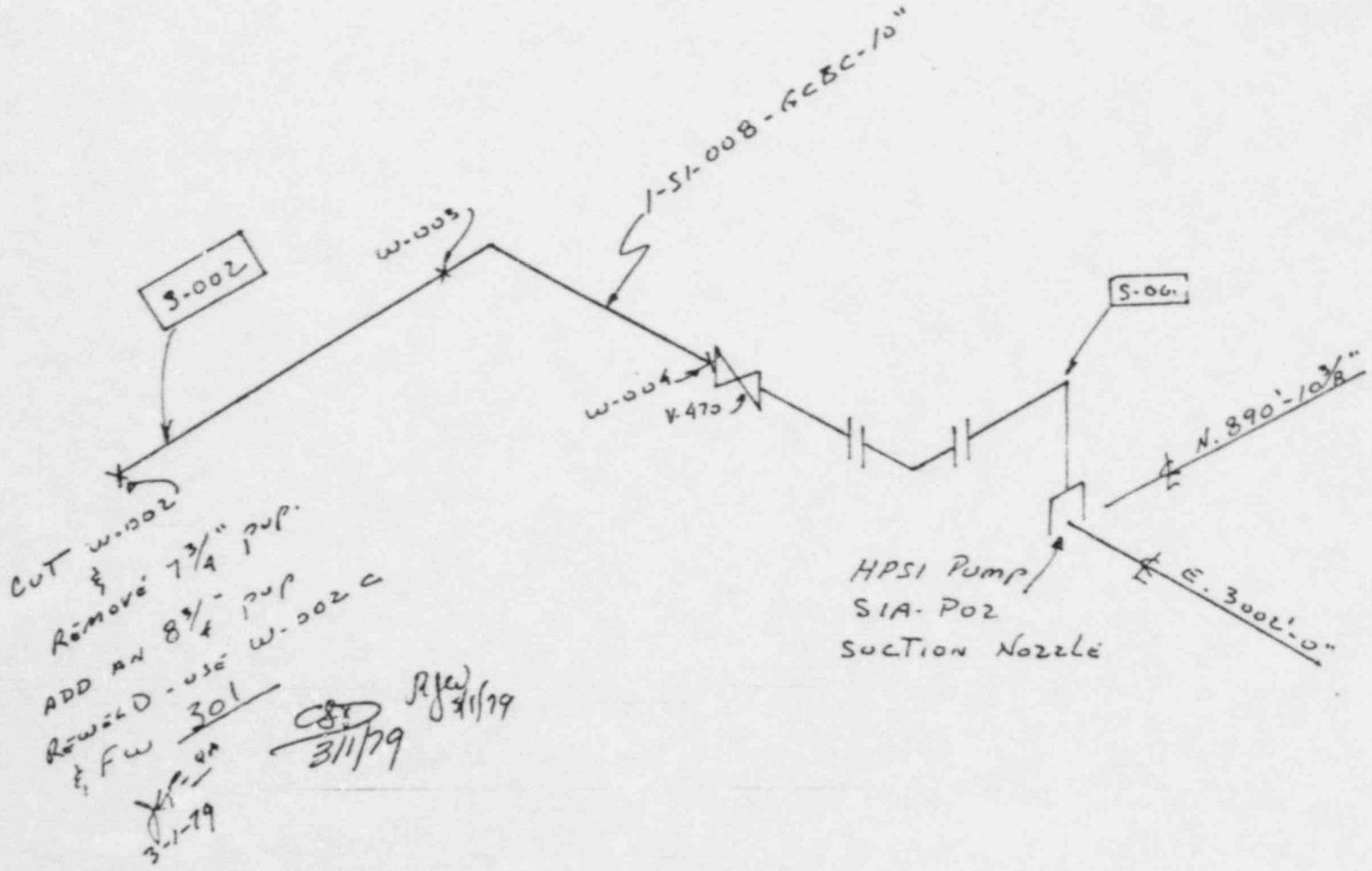
16. FIELD RECOMMENDATION TO PREVENT RECURRENCE

1. NO ACTION REQUIRED AND 2. FIELD ENGINEERING RECOMMENDS THAT THIS NCR BE SENT TO VENDOR FOR CORRECTIVE ACTION. A COPY OF THIS NCR HAS BEEN SENT TO THE PROJECT PROCUREMENT MANAGER FOR ACTION

PFE [signature] DATE 2-21-79

PF-794 (10407) 9/76

RETENTION TIME 4t YRS.



NCR PA-386

RETENTION TIME 5 YRS.

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT

NO R-169 PAGE 1 OF 1

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV.	4. ITEM DESCRIPTION	5. ITEM LOCATION
1	11 7 77	1-SI-008-S-002	N/A	PIPE SPOOL	SOUTH LAY DOWN AREA

6. Q CLASS	7. STARTUP SYSTEM NO.	8. SERIAL NO.	9. CONTRACTOR/SUPPLIER	10. P. O. OR SPEC NO.	11. ASME AUTHORIZED INSPECTION REQ'D.
Q	N/A	N-5589	PULLMAN KELLOGG	13-PM-201	☒ YES ☐ NO

ITEM	12. DESCRIPTION — LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	18. FIELD ENGR DECISION	19. ☒ FIELD RECOMMENDED DISPOSITION ☐ ENGINEER CONCURRANCE REQ'D.
	ONE (1) PIECE OF PIPE SPOOL DAMAGE. MK. # 1-SI-008-S-002. PIPE IS BENT AT BOTH ENDS. APPROX. 1/4".	Reject	Return to Supplier for repair

13. REPORTED BY: G.E. White — DATE 11/7/77

15. INSPECTION/VALIDATION/REVIEW DATE: Allen E Moore 11/7/77

17. PROJ. FLD. ENGR. REVIEW: J E Stanley for NCL (P)

20. TWX/TELECON REFERENCE REPAIR/USE-AS-IS — DATE — EGS/PE: NA

22. ACCEPTANCE OF NEW WORK/REWORK/REPAIR: N A — DATE — INSP: NA

14. CAUSE OF DISCREPANCY: DRIVER UNTIED LOAD AT FIELD RECEIVING STATION. PIPE FELL OFF OF TRUCK ON WAY TO LAYDOWN. N/A DAMAGED PIPE

21. DISPOSITION CONCURRANCE — DATE

PROJ. FIELD ENGR: M.J. McCormick for A.P. — DATE 11/5/77 — NUCLEAR GROUP SUPV.: NA (IF REQUIRED) — DATE

GROUP SUPV.: NA — PROJ. ENGR.: NA

QC AUTHORIZED INSPECTOR: NA — DATE 11/21/77 — QA ENGR: J. E. Stanley — DATE 11-21-77

16. FIELD RECOMMENDATION TO PREVENT RECURRENCE: O.S.&D. report No. 166 informs freight company of problem and cautions against untying of freight prior to unloading.

PE: M.J. McCormick 11-5-77 — DATE

Narbut Notes

Closed Issues

#106

Clamp over Code Plate

Disch Pmp Rm
SI-100 H003

Suction
SI 008 H004

~~WPP 201.1~~ ok if you can read it
- Sabol

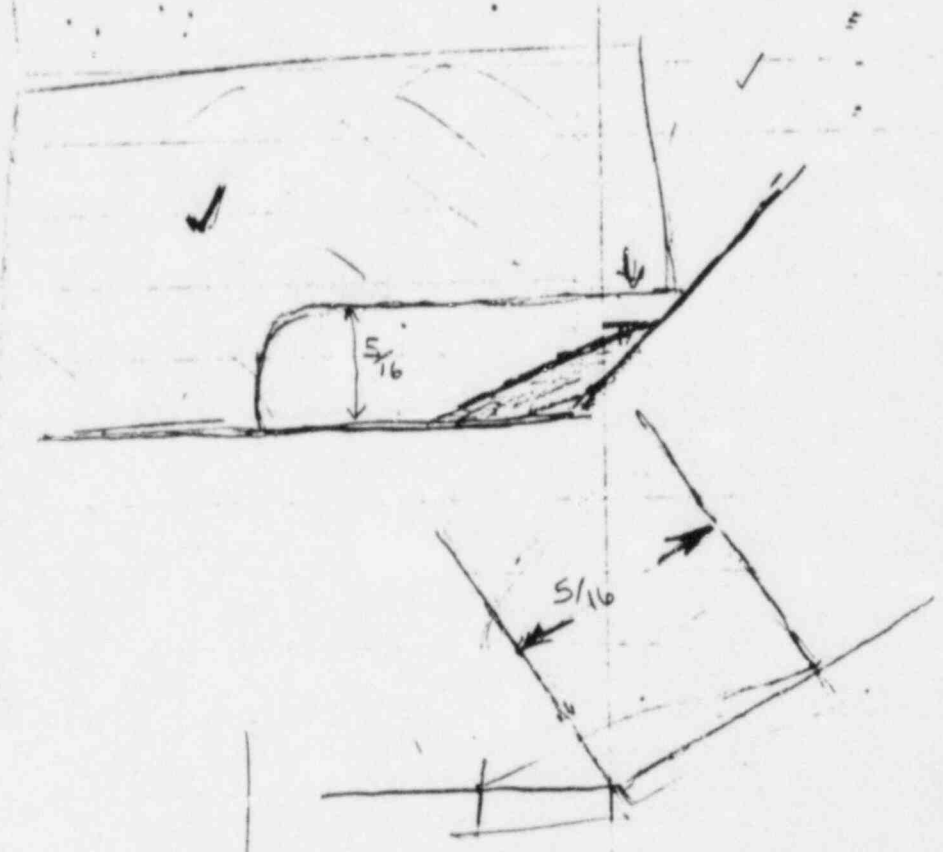
Procedure:

QCI 26.2 — 6.2 states
- removal (if req) for interference

Nothing states how much can be covered
Decision is F.E. discretion if info will be covered

(☆) Do Spec search, Code Search

Done No Code Reqt
Not an issue



60° - 135°

Ld Hgr QCE Jim White

~~Project Engr~~ ~~Bill Miller~~

Welding Engr Gene Slam

Paint allowed on side Plates?

SI 106 - H 007

No reqt on Paint

No reqt on machine surface

Beam already painted

9/7/83

HPSI A 13-P-SIF-201 H005

Notes on 13-SI-008 · H005 Rev 2

overall ok

H003

H004 See Notes on Dwg 13-SI-008 H-004

9/9 - Regarding Pit SI008 - H004

.250 nom wall allowed 12½% on nominal

.219 min wall

.031

Pit .059

— Walkdown for Insulation.

QC1 202

Should have been picked up

- for CIP sign off QC1 200

configuration etc.

NPT 2

Nameplate N5580 1977

→ N5599R 1980

½ Covered w. pipe clamp

Brian F. Love , Startup QCE

Final Walkdown piping prior to lagging:

QCI 204

- par 3.1 - check for damage per ED-1

EDI 2.4.1

minor defects = 3/8 or 10% of thickness whichever less

5.0 Welding Repair

QCI 101 Welding Control

516 Arc strikes - repaired shall have NCR - repair per EDI - par 5.0 Vibro etch on pipe

---

Gil NCR being written Got it

CIP Got it

When 204 put in effect: (11/81?) N/A

Issue Applicable Procedures

either & 202 Piping, Inst Pa. 5.0

or deleted 4/13/82 202.3 Piping, System Final Inspection

or (204)

Resolution

IONC based on WPPQCI 204 inspection should have identified NER PA-7138 resolved non-basis

~~Strap~~ Clamp Clearances SI 008 ~~11001~~ 11002

QCI 201.1

DER 82-73 written 11/82 on Grinnells Clamps - due 10/83

Nothing Specific in Spec.

NCR^s written 10/82

No resolution licensee identified problem

Sabol, Pipe Support Engr. Bechtel

Hot Setting, Cold Setting not per latest Rev

SI008 H-004

CS varies vendor to vendor

- 13 PM 209 = ITT Grinnel
- 13 PM 209B = Pacific Scientific

~~NPT Plate PS install~~

~~assy by ITT~~

Resolved w. explanation

Washers not Installed

Are they required/prohibited

SI 008 H004

Load Bolt — high strength bolt
no washer

Clamp Bolt — no washer req.
could be optional

Per Vendor Dwgs no washers called out

Dont know of washer reqts in QCI

13PM-204 12.3.6 Allows optional use of flat washers

Resolved

Slide Plates SS vs CS → H003 H005

Plate thicker than called out — called out on FCR

13 PM-204 allows Resolved

542.c either CS or SS

Nut on Sway Brace
Only One Installed

H002

Per Corner & Lada
Sway Strut Dwg Fig 631
shows one nut
required

Corner Lada Galvanized
ITT Grinnell Greenish color
Resolved

List of
Snubber Sizes ie. "No 1" on H004

Sway Brace Sizes ie
"C" on H002

PSA Snubber should have
P/N # on it

Look for No 1, 10 etc
on Snubber body

Resolved

Location Tolerances S1008 H002

in 204 and QCI

Grinnell's LCD (load capacity data sheet has adjust

±2 horiz
±6 axially
Resolved

Beam Attachment Pin used vs Bolt.

SI 100 H003

Substitution allowed?

ITT Grimmell Cat shows 5/8 bolt req (for lgr sizes use pin

Corner and Lada Cat (401) shows pin w. cotter pins

→ Part 66 Rev 3

→ Field Stk List Sect 1-16

allows use of C&L 401 for

ITT Pt 66

– Procedure 201.1 § 2.15

allows substitution

— Resolved —

Hot Setting not Right

Dwg doesnt match – Plate on Snubber

13 SI -099 H002

Might be surplus snubber, check hgr tag # or snubber body

Hot setting checked

Rev 1 had HS = 1 5/16 = 1.31

Resolved

13 PM ~~Par~~ 204 ~~Par~~ Par 12.2.1 allows variance on CS provided 1" reserve not infringed on (including max creat

Location Wrong 7/8 vs 15/16

What is tolerance

SI 099 H002

QCI 201.1 9.3.12 allow ±2" horiz
for misc members

Lugs Deleted   SI 105 H00B
H00C
H00D
H00E

Per
QCI 201.1 9.4.2. allows deletion

~~Wh~~ Were lugs removed? No / Not installed

PT records? N/A

Spool dwg applies? Bechtel manufact

Spools N001, C, A

Spool S001 } Not Pullmans,* Look at TDS' in pkg
N00C
N00A

N00A record dont show lugs
N00 C " " " "
N00 B had no hgrs

Resolved Sat

What is max pin to pin dim?

(See QCI Exh 201.1-17)

Resolved 2 #5 for diff - "L" length

Undersize Lug Weld

SI 100 H-034 n/d ok
H 002 ok Dan
H-015

Dwgs 13 SI-100 H-034 Rev 1
shows lug configuration one lug 3/16 fillet
different lower loads
Rev 2 revises lug location changes loads
calls for 1/4" fillet
Rev 3 Revised thermal movement
Rev 4 Show 1/4" all units

— Pullman power Dwg F-161A Rev 3
Shows 1/4" weld typ lugs to spool
spool 2

QCI 201.1 Par 14.3 requires QC insp of vendor welds
date added to QCI = 7/20/79 PCN 29
date of QC inspection H034 =
H002 =

Need CIP's for H034, H002, H015

G.1 Will Check DER 79-10? APS was to do 100% reinsp of vendor welds.

* Procedure Change Effect. Date

Loose Nut on Sway Strut (Wagner Ident)

SI 101 H00A1

ITT SI 107 H025

CIP 201.1 15.4 turn in "IIL" on incomplete item

QCE Stamps CIP Hanger Control Card Item 1 Support per dwg

Also observed single loose nut on Sway Strut on SI-107 H025 (not inspected hgr but in area)

Actions 9/12

① Inspect Clamp size SI 100 H 003
Right size Should have tightened lower bolt more

② Check w/ Sabol does as built w/o log show NCR's

③ Code Search for Clamp over Code Plate

Where does 75% of lug contact reqt come from?

See FCR w. SI-100-H009

Originating Engr believed in QCI

Sabol checked PCN's can't find reqt deleted

PCN 39 11/10/79 9.8.4

204 12.3.8 A

Revise 201.15.7

Carry as open item:

What are AWS words on eff. throat

SI 100H - 011

① - Code applies to 60° to 135°
- Angle was 45° — equal

② Does engineering take resp.
or is field to do calc
Sabd

ok

Shims welded to pipe clamp
SI 176 H1004

Need to pull CIP
Should be in Grimnell's N5 rpt.

Grinnel doesn't make a 3" clamp
Shims out a 3½ clamp.

Measurement of Weld by QC

Hgr SI 176 - H003

Need NCR on SI 176 H003

NCR WC 812 w. Marini

(1) vis. est 1/32 gouge
orig undercut + grinding
toe of weld

(2) Wraparound w. Marini
Transverse undercut
1/32" + 1/4" long
[almost sat w 1/32 criteria
judgement call either way

Unsat for .01" criteria

No Lockwire on Grinnell Snubber Body Bolts

CIP 201.1-16 for Snubbers clearly shows PSA Lockwire ITT shows torque verification

Item 3 of Grinnells PHD 7594-1 Maint & Install Manual Rev 2 11/28/78

		Item 3	
¼ kip	22 in lbs	10-24 × 5/8	SA 320 Gr L7A socket hd cap screw SA-354 Gr BD
1 kip	45 in lbs	¼ × 20	

Washers SA 325 (Hardened)

Sat: Body bolts high strength procedure excepts high strength

QCI 201

Loose U bolts 1/16 - 1/8 gap + 3 nuts.

~~X~~ PSA ± 5°

Location tolerances (9.0) > 2½ ± 2" vert
± 6 horiz

QCI Notes

Material Substitution QCI Par 6.1

Material Defects

Install per Dwg 7.2

Locking Devices 8.3

U Bolts 8.6 & 9.24

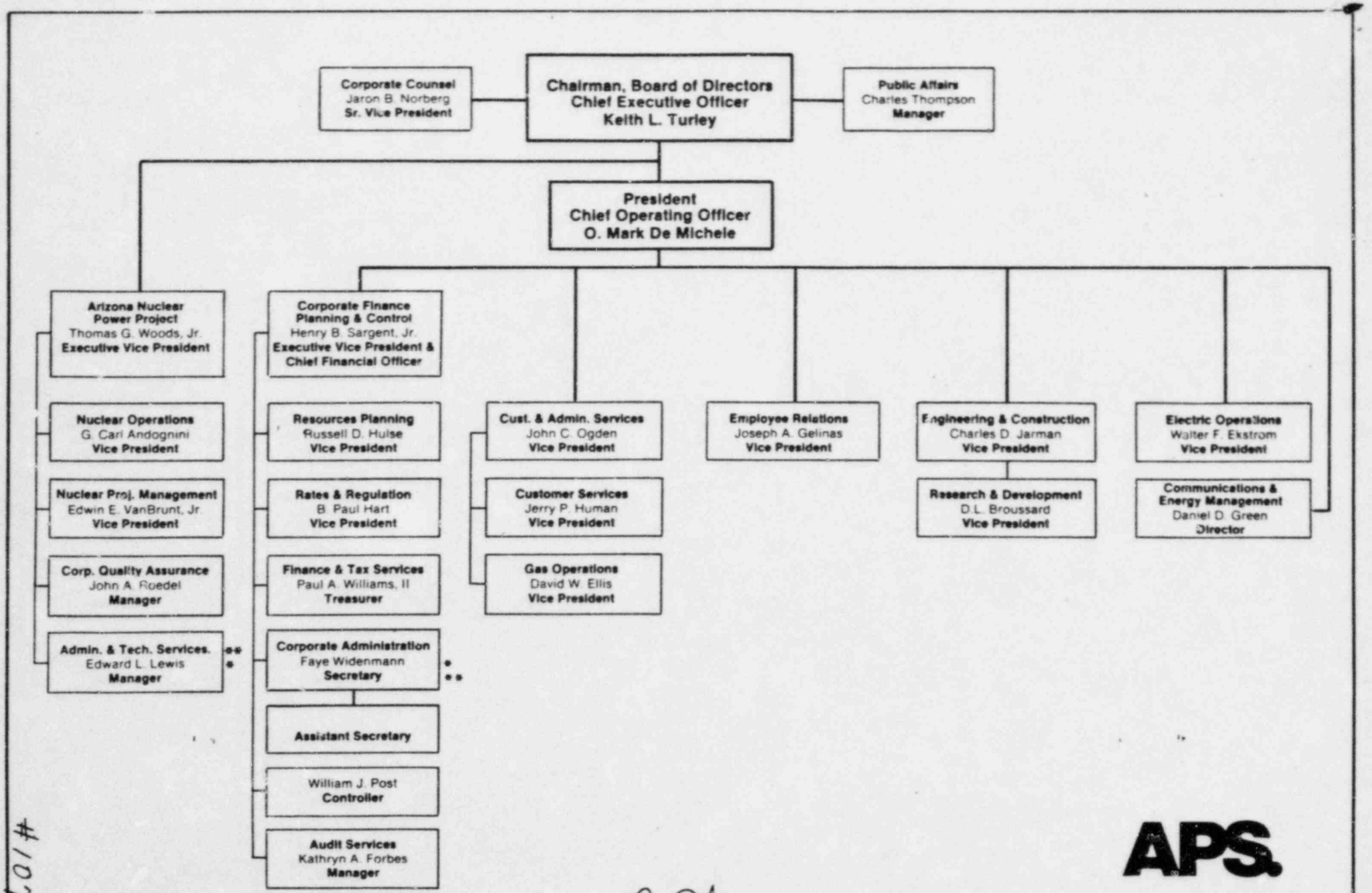
Spring Cans 8.8
Snubbers 9.10 + 9.26
Clamps 8.9
Misc Bolting 8.13 (7/8" A325)
Beam Attachments 9.27

Lateral Restraint Clearance 9.5

Narbut Notes

Total hgr count

13 P SIF -136		3
13 P SIF 204		20
01 P SIF 105		15
13 D SIF 203	6+3+3+11+24+13+3+8 =	71
13 P SIF 201		5
13 P SIF 103		2
~~13 P SIF 136~~	Total	116 hgrs



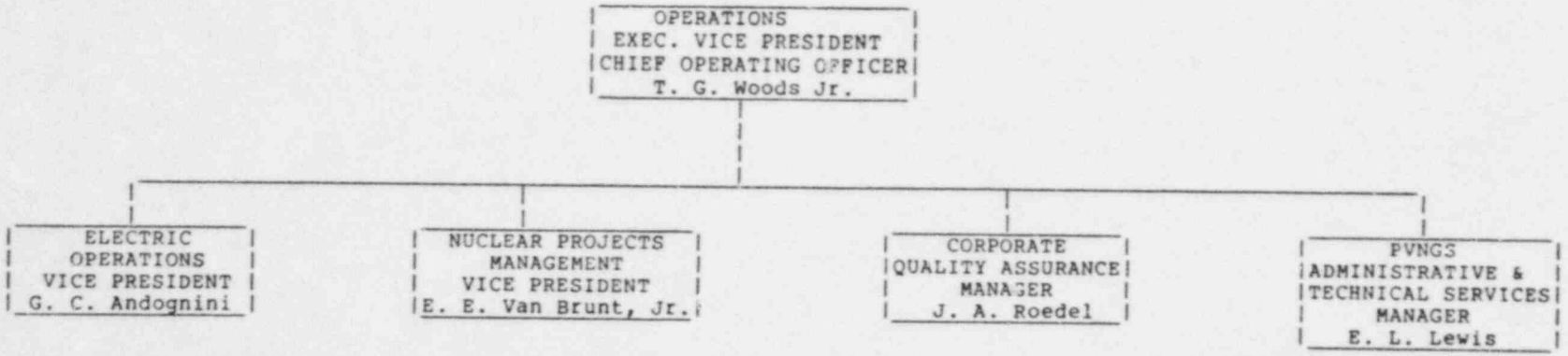
APS.

ARIZONA PUBLIC SERVICE COMPANY
Organization Diagram
August 1, 1983

APPROVED:
Keith L. Turley
Chairman, Board of Directors & Chief Executive Officer

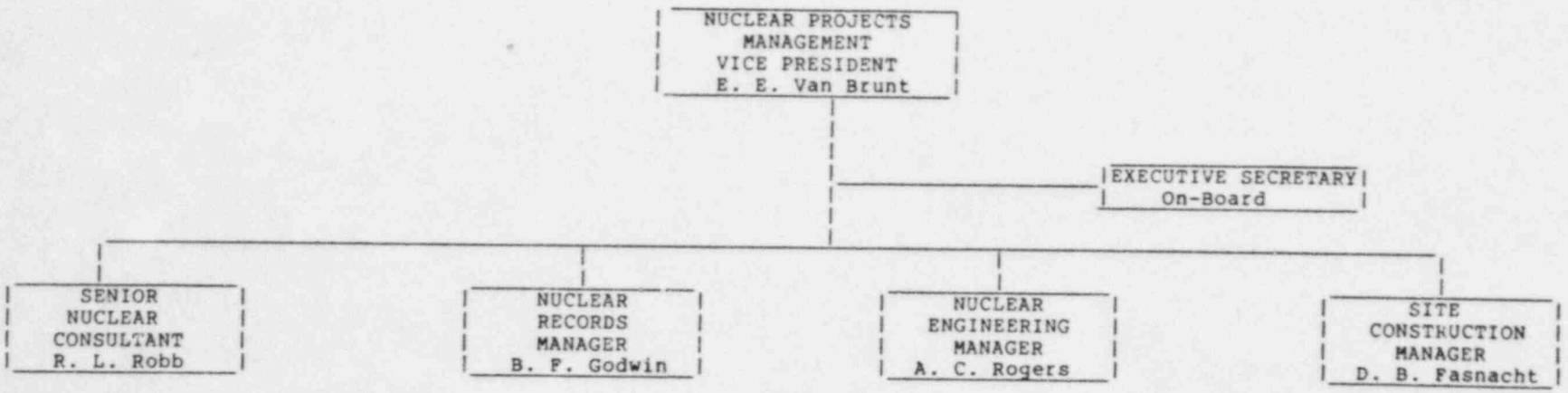
APPROVED:
J.K. Wallington, Mgr., Manpower Planning & Development

Page 1 - 1


OPERATIONS
EXEC. VICE PRESIDENT
CHIEF OPERATING OFFICER
T. G. Woods Jr.
ELECTRIC
OPERATIONS
VICE PRESIDENT
G. C. Andognini
NUCLEAR PROJECTS
MANAGEMENT
VICE PRESIDENT
E. E. Van Brunt, Jr.
CORPORATE
QUALITY ASSURANCE
MANAGER
J. A. Roedel
PVNGS
ADMINISTRATIVE &
TECHNICAL SERVICES
MANAGER
E. L. Lewis

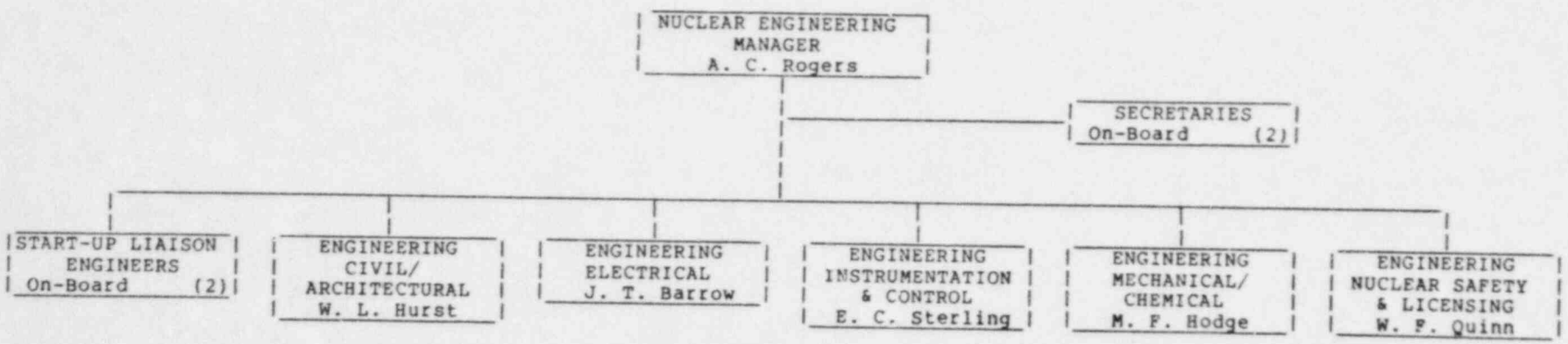
REVISION 1
(Through 1985)

NUCLEAR PROJECTS MANAGEMENT



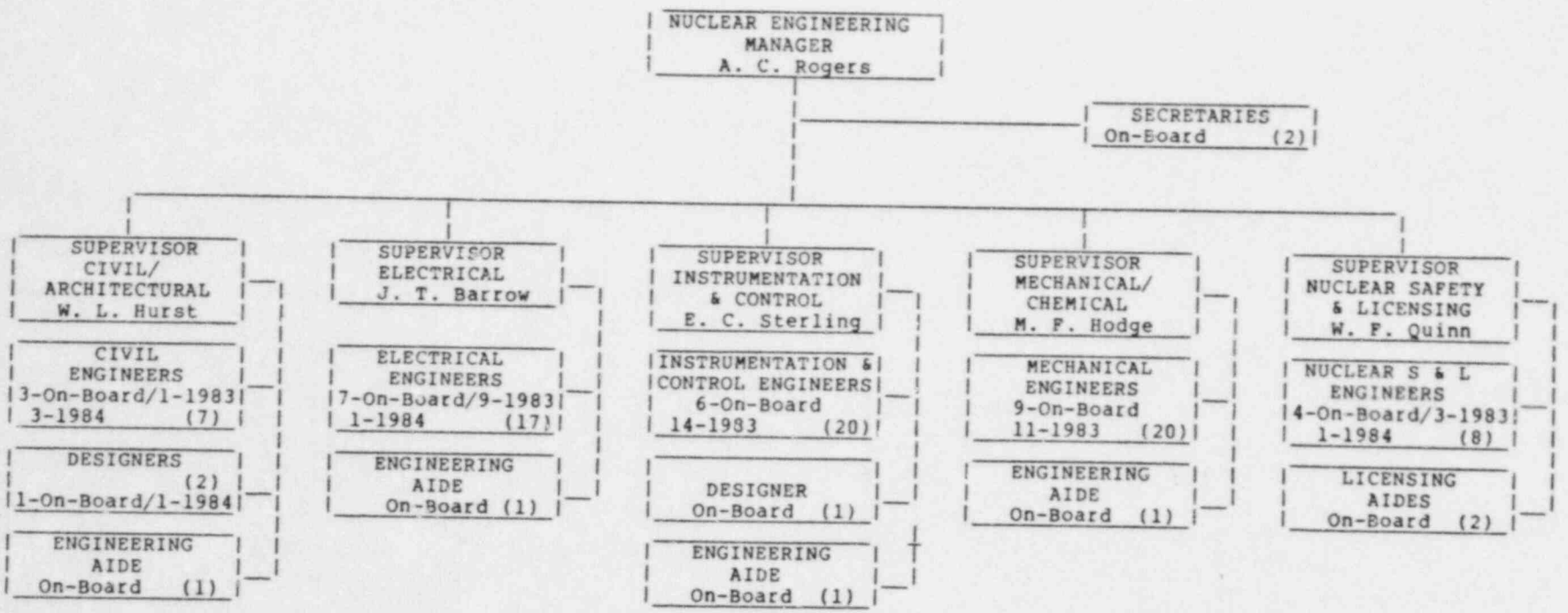
REVISION 1
(Through 1985)

NUCLEAR PROJECTS
NUCLEAR ENGINEERING



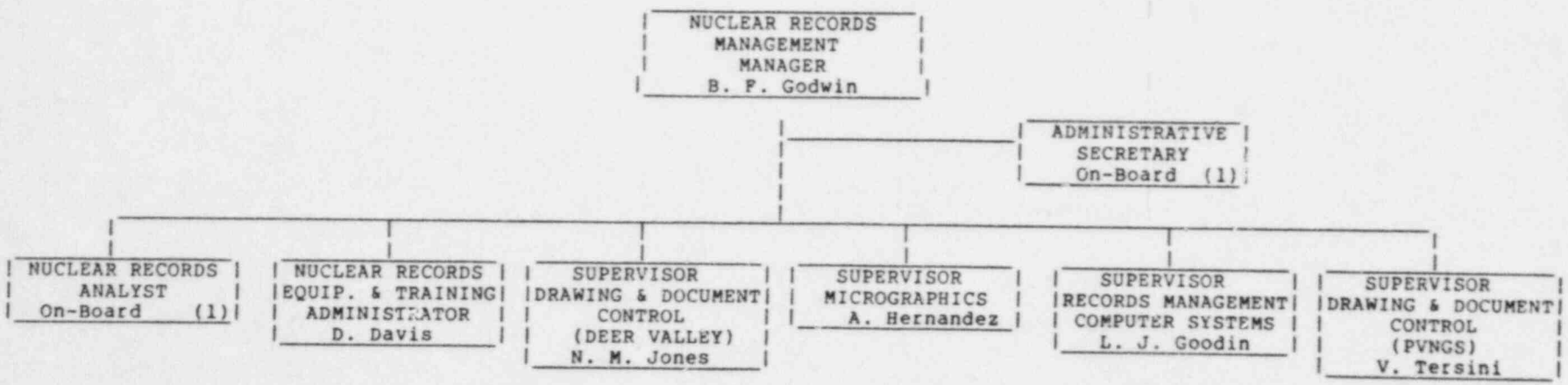
REVISION 1
(Through 1985)

NUCLEAR PROJECTS
NUCLEAR ENGINEERING



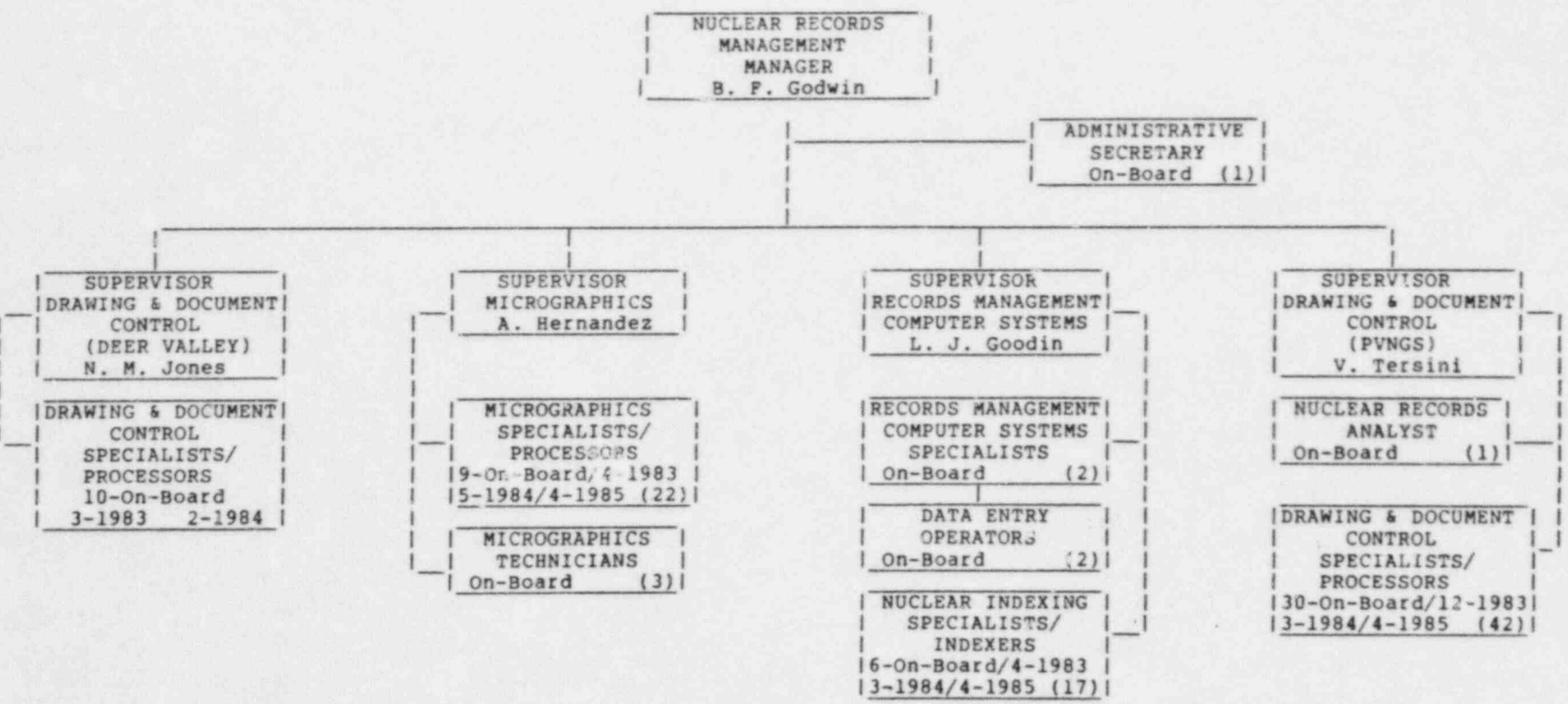
REVISION 1
(Through 1985)

NUCLEAR PROJECTS
NUCLEAR RECORDS MANAGEMENT

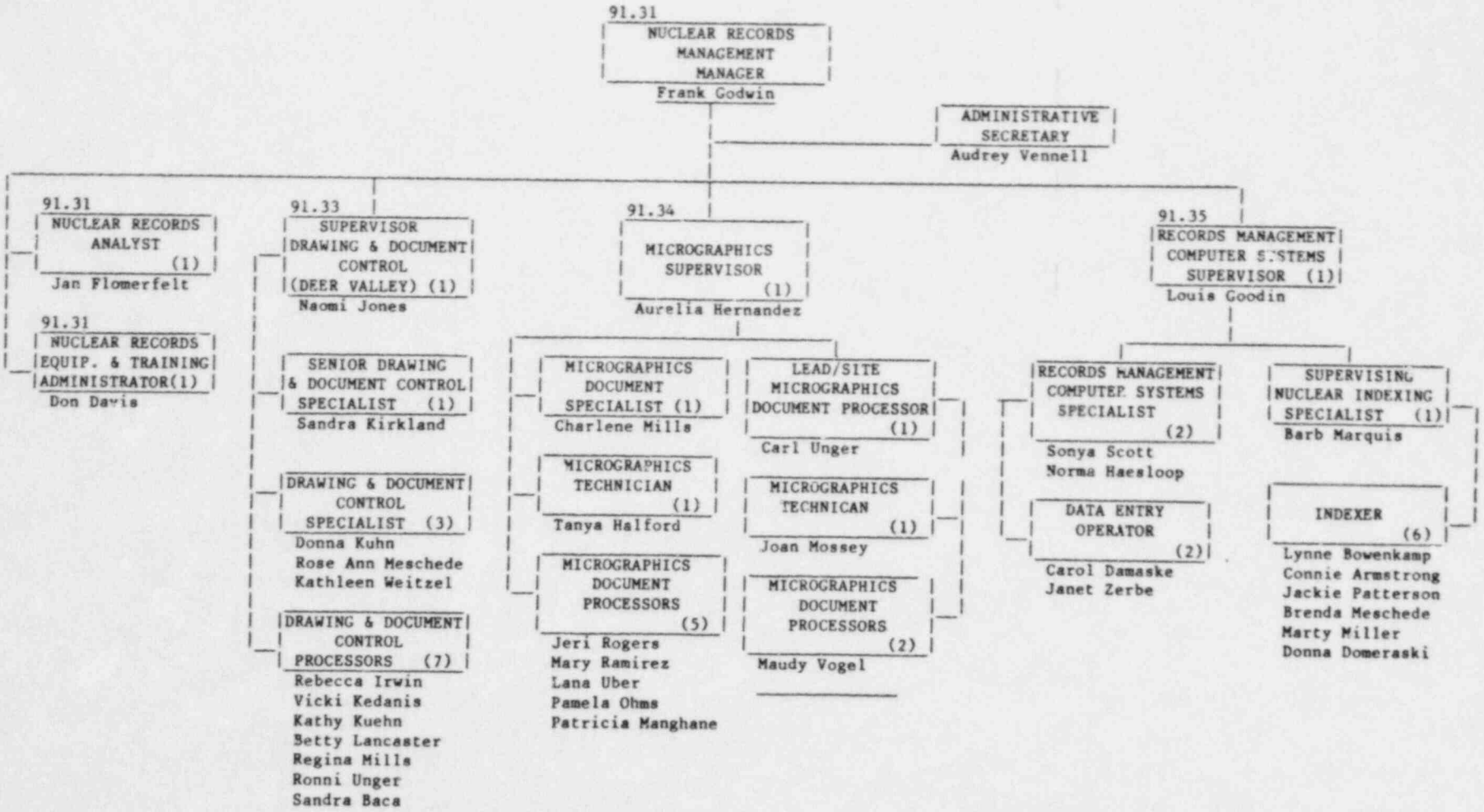


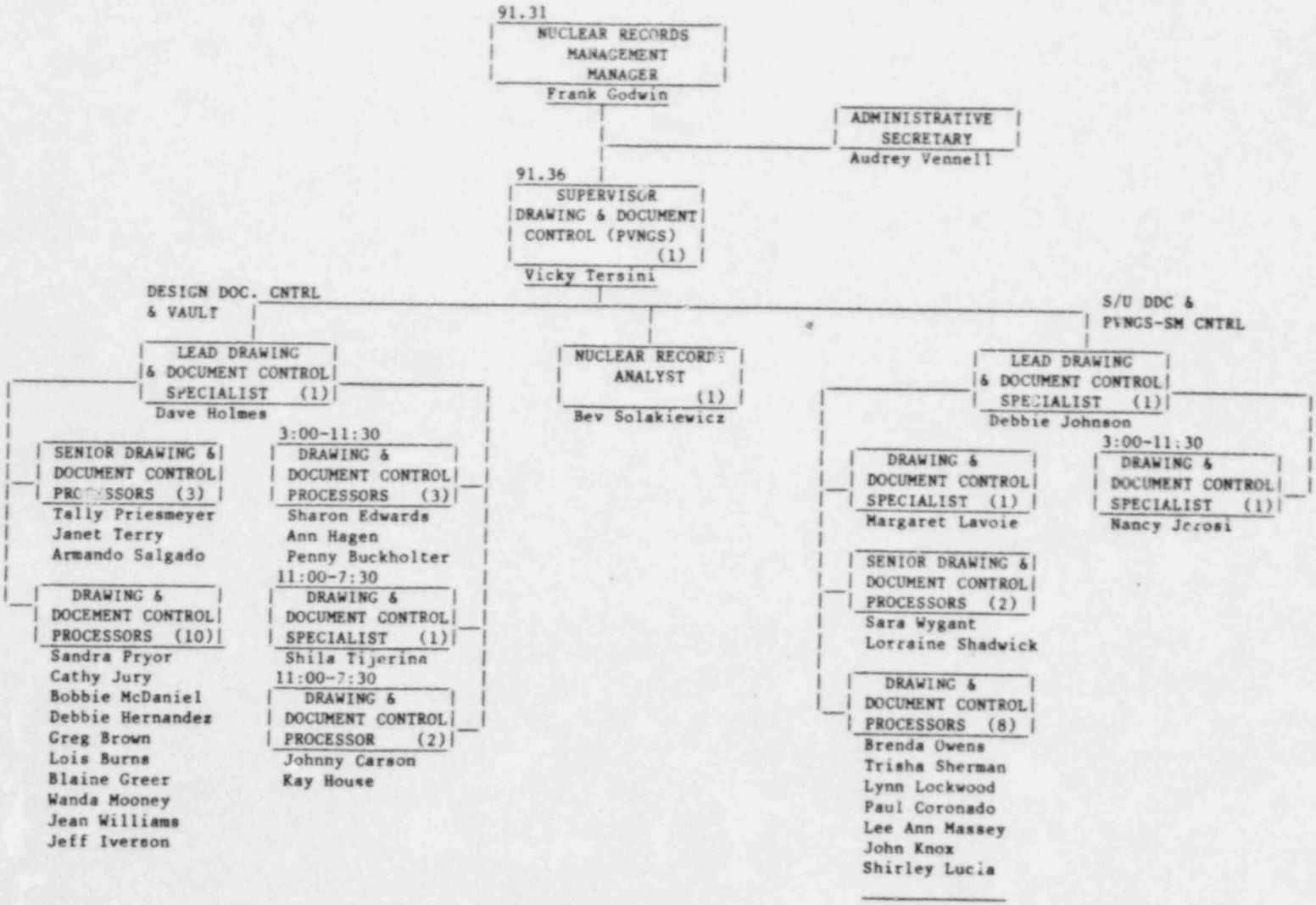
REVISION 1
(Through 1985)

NUCLEAR PROJECTS
NUCLEAR RECORDS MANAGEMENT



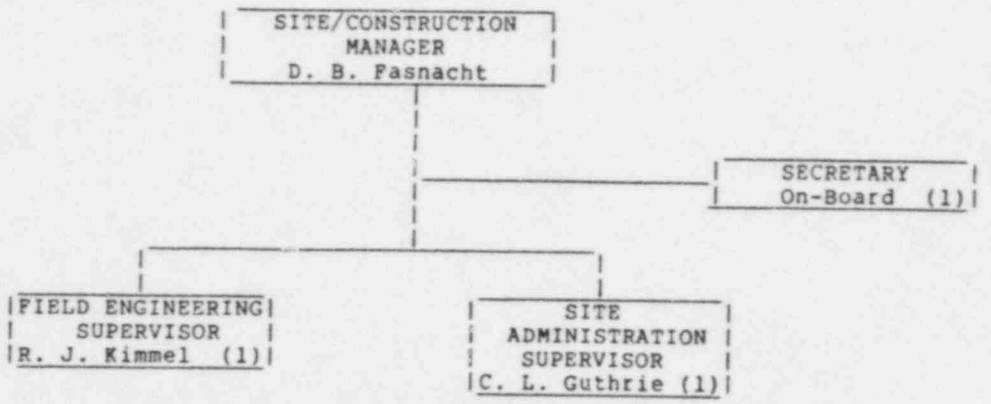
ATTACHMENT B




91.31
NUCLEAR RECORDS MANAGEMENT MANAGER
Frank Godwin
ADMINISTRATIVE SECRETARY
Audrey Vennell
91.36
SUPERVISOR DRAWING & DOCUMENT CONTROL (PVNGS) (1)
Vicky Tersini
DESIGN DOC. CNTRL & VAULT
NUCLEAR RECORDS ANALYST (1)
Bev Solakiewicz
S/U DDC & PVNGS-SM CNTRL
LEAD DRAWING & DOCUMENT CONTROL SPECIALIST (1)
Dave Holmes
SENIOR DRAWING & DOCUMENT CONTROL PROCESSORS (3)
Tally Priesmeyer
Janet Terry
Armando Salgado
DRAWING & DOCEMENT CONTROL PROCESSORS (10)
Sandra Pryor
Cathy Jury
Bobbie McDaniel
Debbie Hernandez
Greg Brown
Lois Burns
Blaine Greer
Wanda Mooney
Jean Williams
Jeff Iverson
3:00-11:30
DRAWING & DOCUMENT CONTROL PROCESSORS (3)
Sharon Edwards
Ann Hagen
Penny Buckholter
11:00-7:30
DRAWING & DOCUMENT CONTROL SPECIALIST (1)
Shila Tijerina
11:00-7:30
DRAWING & DOCUMENT CONTROL PROCESSOR (2)
Johnny Carson
Kay House
LEAD DRAWING & DOCUMENT CONTROL SPECIALIST (1)
Debbie Johnson
DRAWING & DOCUMENT CONTROL SPECIALIST (1)
Margaret Lavoie
SENIOR DRAWING & DOCUMENT CONTROL PROCESSORS (2)
Sara Wygant
Lorraine Shadwick
DRAWING & DOCUMENT CONTROL PROCESSORS (8)
Brenda Owens
Trisha Sherman
Lynn Lockwood
Paul Coronado
Lee Ann Massey
John Knox
Shirley Lucia
3:00-11:30
DRAWING & DOCUMENT CONTROL SPECIALIST (1)
Nancy Jerosi

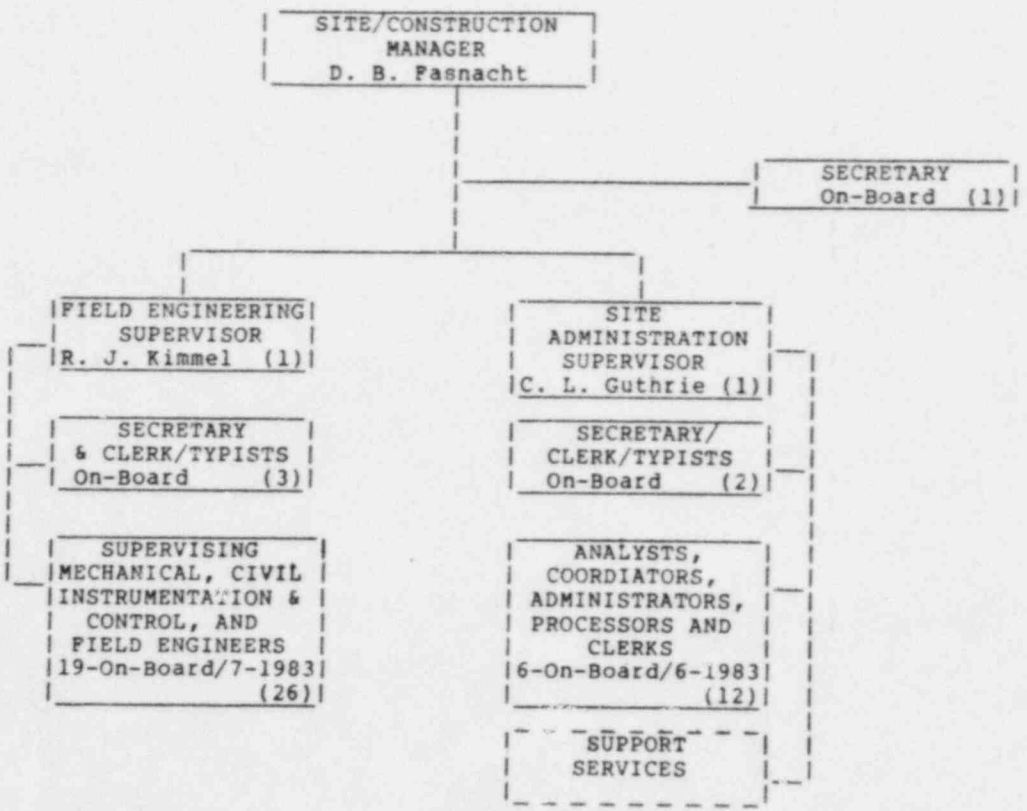
REVISION 1
(Through 1985)

NUCLEAR PROJECTS
NUCLEAR CONSTRUCTION



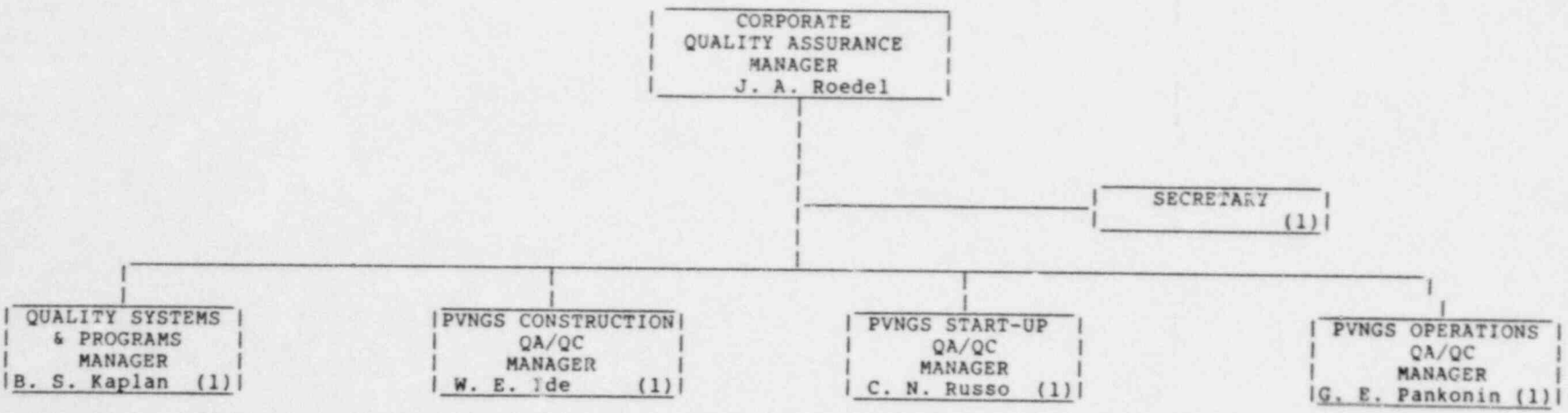
REVISION 1
(Through 1985)

NUCLEAR PROJECTS
NUCLEAR CONSTRUCTION



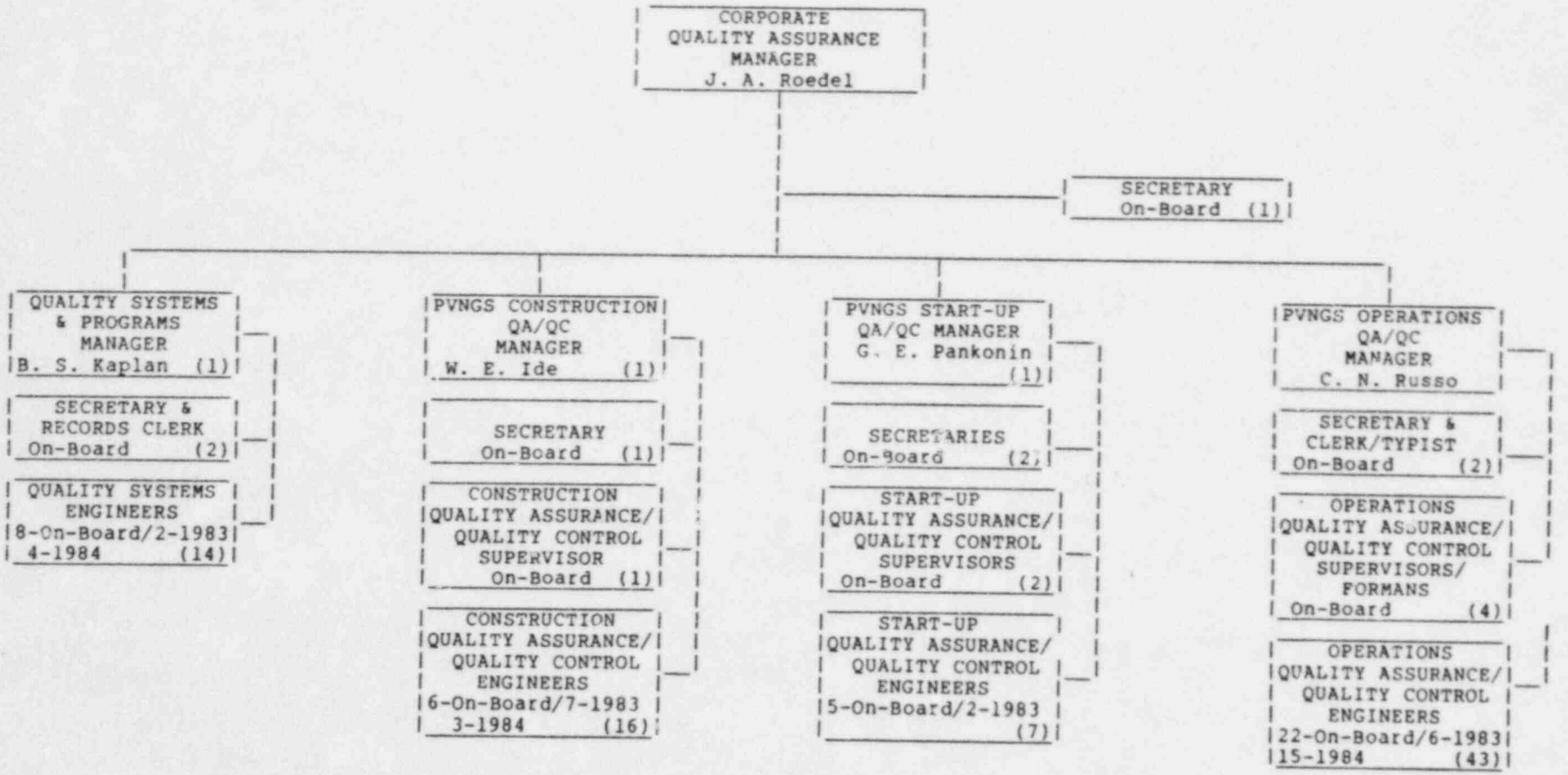
REVISION 1
(Through 1985)

CORPORATE QUALITY ASSURANCE

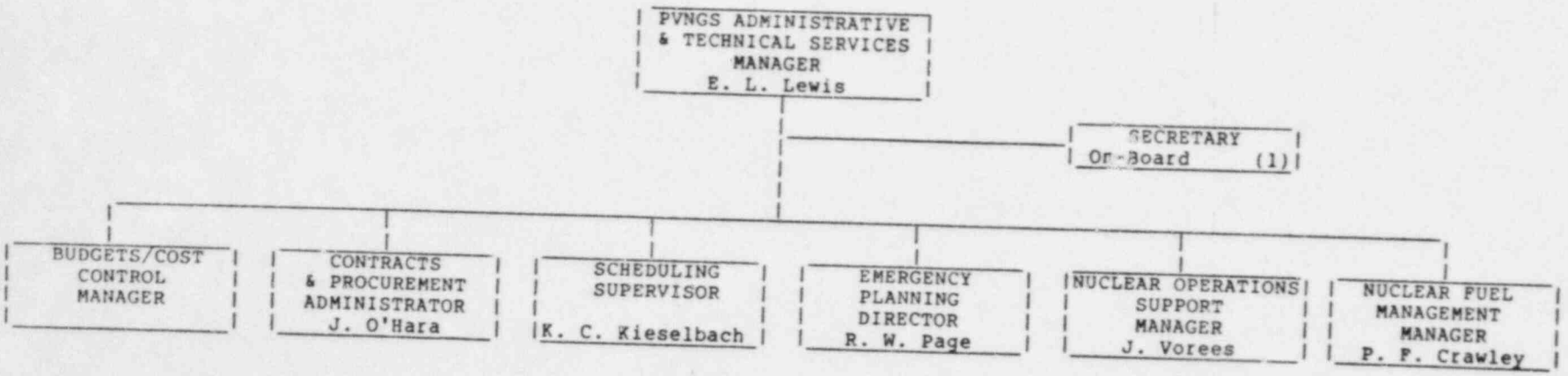


REVISION 1
(Through 1985)

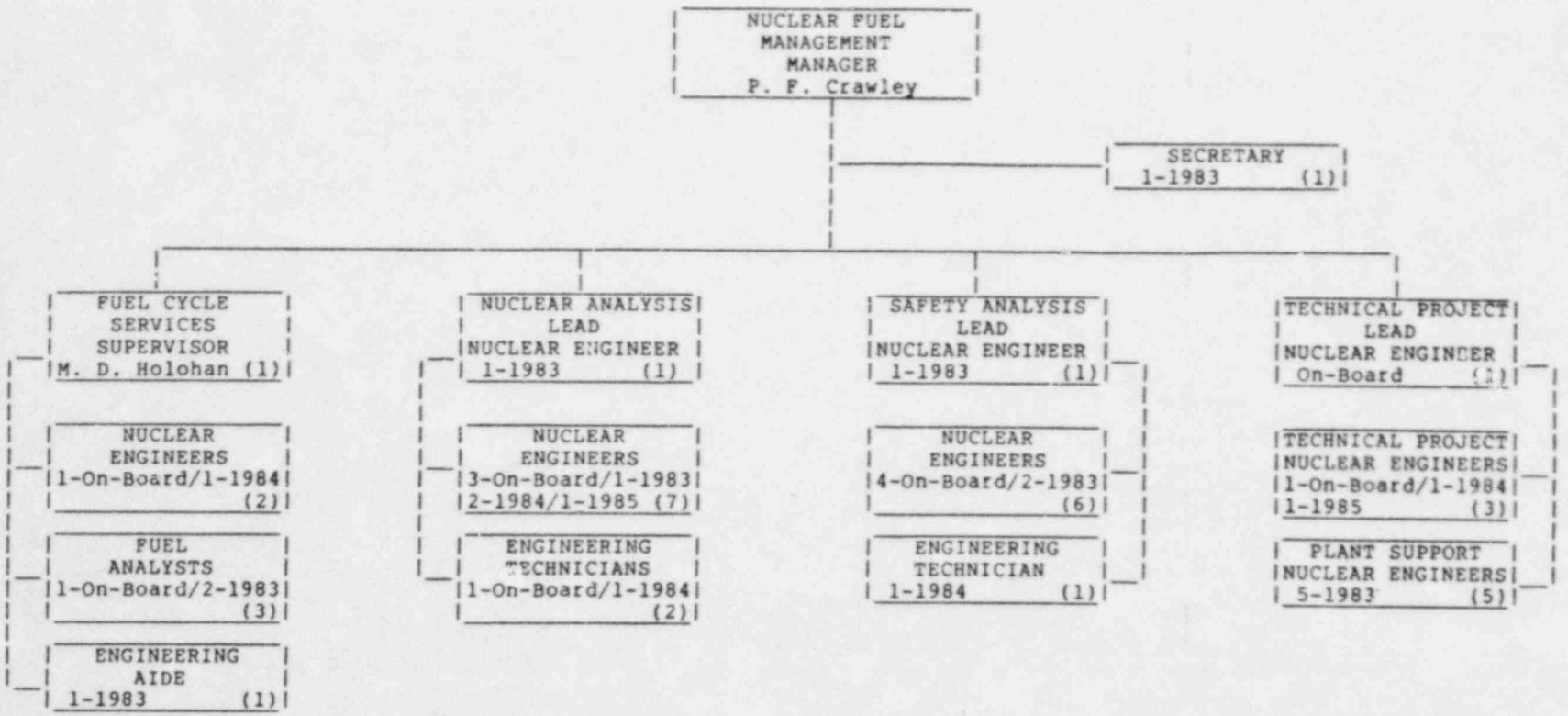
CORPORATE QUALITY ASSURANCE



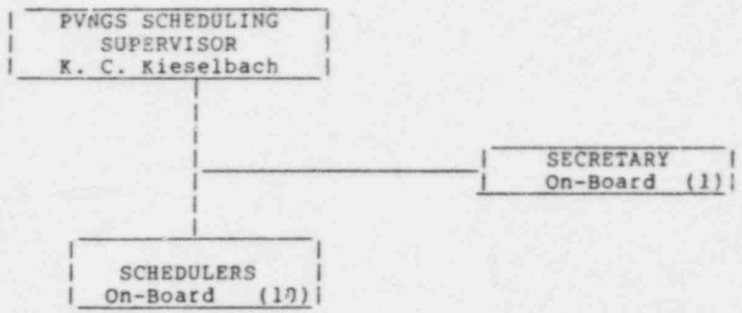
PVNGS ADMINISTRATIVE & TECHNICAL SERVICES



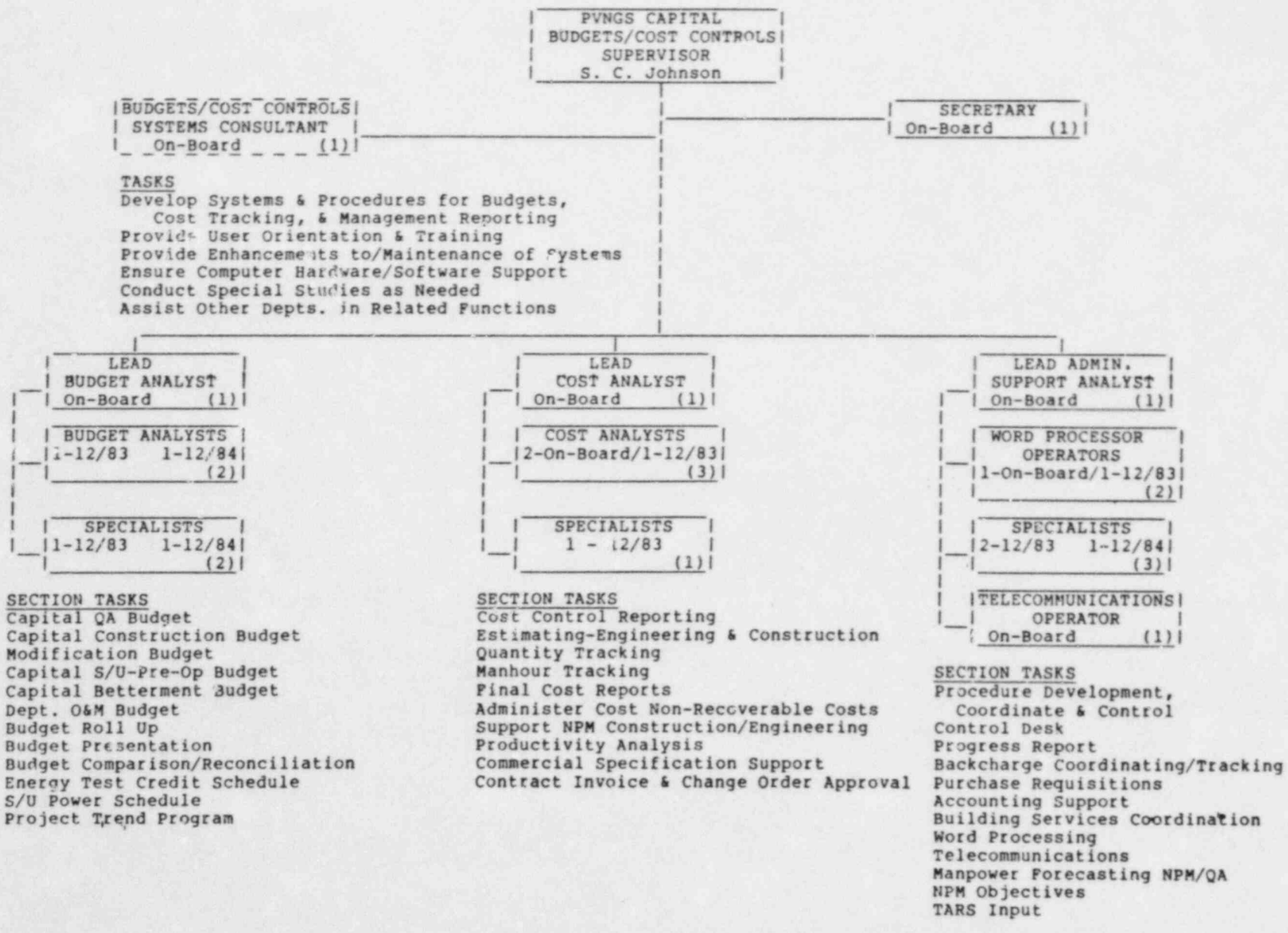
PVNGS ADMINISTRATIVE & TECHNICAL SERVICES
NUCLEAR FUEL MANAGEMENT



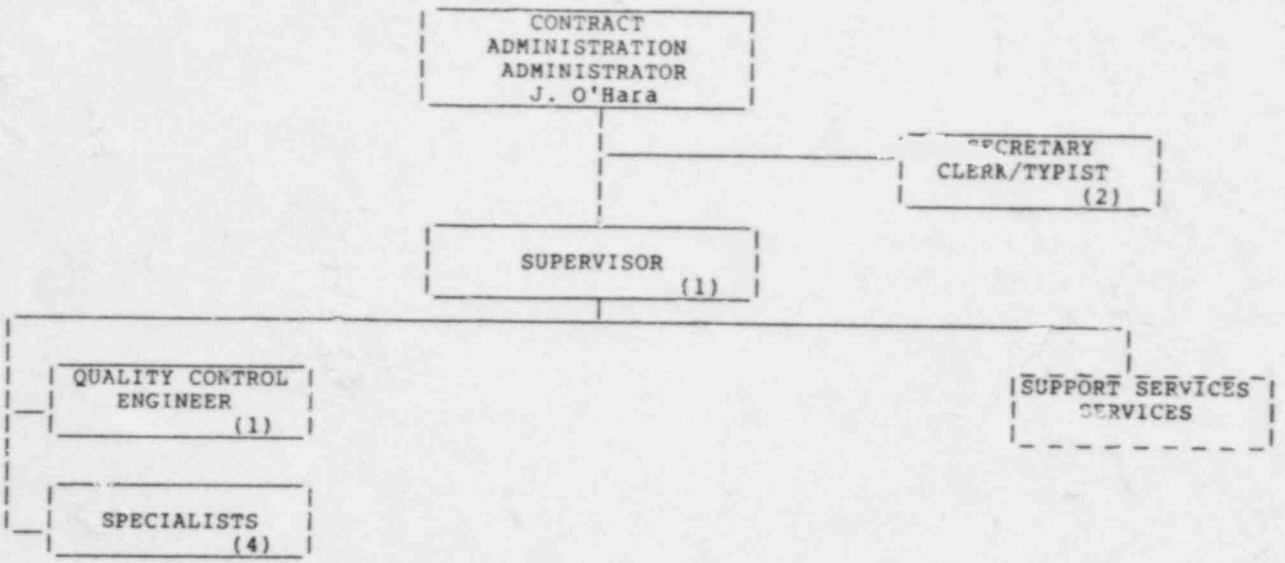
PVNGS ADMINISTRATIVE & TECHNICAL SERVICES
PVNGS SCHEDULING



PVNGS ADMINISTRATIVE & TECHNICAL SERVICES
PVNGS CAPITAL BUDGETS/COST CONTROLS



PVNGS ADMINISTRATIVE & TECHNICAL SERVICES
CONTRACT ADMINISTRATION



Narbut

Bio data Sheet

Name (as you want it to appear on report)	Paul P. Narbut
Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified)	Project Inspector USNRC
Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe)	Nuclear Engineer
Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience)	20 years experience in design, construction and testing of nuclear power plants

#108

Burdoin

Bio Data Sheet

Name (as you want it to appear on report) — JOHN F. BURDOIN

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — REACTOR INSPECTOR

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — ELECTRICAL ENGR. CALIF. 3 Lic (EE, ME, NUE)

Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 36 YRS. IN ELEC. ENGR'G.

Young

Bio Data Sheet

Name (as you want it to appear on report) — TOLBERT YOUNG JR.

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — SECTION CHIEF, USNRC

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — REGISTERED PROFESSIONAL ENGINEER, NUCLEAR, STATE OF CALIFORNIA

Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 22 YEARS NUCLEAR POWER [redacted] PLANTS

Walton

Bio Data Sheet

Name (as you want it to appear on report) — Glenn A. Walton

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — Senior Resident Inspector B.V.2

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — Welding, NDE & Structural Steel Specialist

Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 17 yrs experience Babcock & Wilcox Co. as NDE Mgr. & Q.C. Mgr. 10 yrs. experience with NRC as Specialist in Mechanical area

Wagner

Bio Data Sheet

Name (as you want it to appear on report) — W. J. Wagner

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — Reactor Inspector

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — 'Professional Engineer in State of Calif. (Quality)
'American Welding Society Certified Welding Inspector

Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 24 yrs experience in metallurgy, quality assurance and nondestructive examination

Kerch

Bio Data Sheet

Name (as you want it to appear on report) — HARRY W KERCH

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — LEAD REACTOR ENGINEER

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — ASNT NDE LEVEL III

STATE OF CAL IN QUALITY.

Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 35 yrs NDE

15 yrs of the above nuclear.

Verdirbruggen

Bio Data Sheet

Name (as you want it to appear on report)	L E VERDERBRUGGEN
Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified)	SENIOR RESIDENT INSPECTOR (CONST)
Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe)	~~B~~ BSEE, CONSTRUCTION SPECIALIST
Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience)	36 years experience in design of steel, chemical, and power plants, and in inspection and operation of nuclear power plants

Harris

Bio Data Sheet

Name (as you want it to appear on report) — Richard H. Harris

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — Engineering Tech.

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — LEVEL II ASNT Certified Welding Inspector (CWI) A.W.S.

Your Experience Supporting Your Professional Qualification (e.g. 40 years electrical design experience, 35 years NDE experience) — 1½ yrs Tech. USNRC R1
(N/A) 3yrs Const. Nuclear power plant(QC)
(N/S) 3yrs Vendor Surveillance
3yrs Inspection Laboratory (NDE)
11yrs Steel Mill (NDE)

Campbell

Bio Data Sheet

Name (as you want it to appear on report) — Randy M. Campbell

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — Engineering Tech

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — ASNT Level II; Certified Welding Insp. (CWI) AWS

Your Experience Supporting your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 5yrs Test Laboratory NDE; 4yrs (TVA) Vendor Surveillance

Stanley

Bio Data Sheet

Name (as you want it to appear on report)	LOREN STANLEY
Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified)	PRIVATE CONSULTANT
Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe)	REGISTERED P.E. (EE) IN CALIF SPECIALIZING IN INSTRUMENTATION AND CONTROL
Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience)	15 YEARS ELECTRICAL DESIGN EXPERIENCE WITHIN OVERALL 27 YEARS ENGINEERING EXPERIENCE.

Marini

Bio Data Sheet

Name (as you want it to appear on report) — WILLIAM MARINI

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — PRIVATE CONSULTANT

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — LEVEL III ELECTRICAL + V.T.

Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 13 YEARS OF NUCLEAR [redacted] ELECTRICAL AND WELDING [redacted] INSPECTION EXPERIENCE.

Crane

Bio Data Sheet

Name (as you want it to appear on report) — CYRIL J. CRANE P.E.

Your Current Position (e.g. Project Inspector USNRC, Private Consultant or however you wish to be identified) — WESTEC SERVICES, INC. PRINCIPAL ENGINEER Consultant to NRC for Palo Verde CAT

Your Principal Qualification (e.g. Level III ASNT, Registered Professional Engineer, Electrical Specialist or however you wish to describe) — Electrical Engineer Registered Professional Engineer

Your Experience Supporting Your Professional Qualifications (e.g. 40 years electrical design experience, 35 years NDE experience) — 14-years of Reactor Operations, Maintenance and Engineering experience 8-years of nuclear electrical design experience. 5-years of Electrical Engineering Consulting and A/E electrical engineering

HAYES 2F-L2 216 8.1.01

ARIZONA PUBLIC SERVICE COMPANY

COMPANY CORRESPONDENCE

PVNGS-SMM-M82-104

PVNGS-GCA-M82-257

DATE: September 28, 1982

TO: W. Stubblefield
Sta. #: Bechtel Construction Building

FROM: S. M. Moyers x6440
Sta. #: 6310
Ext. #: 6440

SUBJECT: Construction/APS Operation Interface on Pump Doweling

File: 001-503

Prepared by: _____
S. M. Moyers

Reviewed by: _____
R. Taylor

Reviewed by: _____
J. Zerucha

Approved by: _____
J. Kirby

Approved by: _____
C. G. Andognini

The final alignment and doweling of pumps and motors was originally scoped to be accomplished as part of the pre-op tests because that was expected to be the start of the major runs on the equipment. With the startup activities as now scoped, significant run time on equipment is being experienced through the prerequisite phases of testing and long before the equipment is turned over to APS.

In cases where the equipment will experience significant operation before turnover, the pump-motor final alignment and doweling should be carried out by the Bechtel Millwrights to preclude any equipment damage as a result of slippage. It is requested that APS Maintenance be notified to observe this activity when it is required. Should any assistance in the alignment or vibration analysis be required during this phase, the APS Maintenance Department will provide it as needed, with the Bechtel crafts doing the actual work until such time the equipment is turned to APS.

SMM:jvb

cc: List X
J. Houchen
R. Ozment
A. Priest
J. Zerucha

RECEIVED
CONSTRUCTION
PVNGS

#109

MEMORANDUM

TO Leon Arek Mech. Discipline LOCATION Main Office

FROM D. Cranmer Mech. Engineer DATE 2-1 19 83

SUBJECT Equipment Dowling Unit #1, 2, 3 JOB NO PVNGS 10407

FILE

0830-1N APS Steve Mayer Office

Attendees - D. CRANMER - Bechtel

F. NORRIS - APS

S. Mayer - APS

Per APS letter dated Sept. 28, 1982 re PVNGS GCA-N82-257

Discussions were based on type of equipment APS wished to have Bechtel dowel. We discussed types of dowels, material composition, sizes, labor, and all phases of the work.

APS is interested in Bechtel labor forces to dowel only the Circulating Water Pumps (13MM008) CWN P01 A/B/C/D and Plant Cooling Water pumps (13MM082) PWN P01 A/B at the present time. Bechtel will supply "all" materials, tools, labor & supervision. One APS representative will occasionally check progress. Labor charges will be charged against one account number supplied by APS. APS will send a letter via Stubblefield requesting the dowling with pertinent information included.

Continued
Page 2

MEMORANDUM

TO _____ LOCATION _____

FROM _____ DATE 2-1- 19 83

SUBJECT Equipment Lowering Units #1, 2, 3 JOB NO _____

FILE _____

Unit #1 Equipment is ready to be lowered since all pumps have been run. Exception can be the "C" Circulating Water pump which has a Vibration problem.

Unit #2 Equipment will be lowered per letter of reference.

#3 Unit - Far down the road - but this lowering is applicable as in other units.

R J Crammond
Mech Eng.

C.C. Steve Moyers - APS
Rod Rudick - Bechtel
Hal Thornberry - Bechtel
Dave Tomlee - Bechtel

Op. Read. Review / Ede — 4/22 → 5/13/83

Developed Checklists for Design, Procurement, Work Control, Misc (surv. test, sof. audit, NCC reporting, etc.)

Under Work Control – Maint. / Modif.

Topic: Alignment of Equip.

Found Procedure No. assignment

31MT-9ZZ03

PURCHASE REQUEST (PR)
PALO VERDE NUCLEAR GENERATING STATION

APS.

P.O. NO.

KEY ENTRY - LINES 1 THRU 7 REQUIRED. LINES 8, 9, & 10 ANY ENTRY MAKES ALL THREE LINES REQUIRED.

PRIATE TERM:
SR = SAFETY-RELATED
NSR = NON SAFETY RELATED

SHIP TO (MAX 30 CHARACTERS PER LINE)	PROJECT NO	SUB-PROJ NO	PROJECT NAME (MAX 13 CHARACTERS)	SR / NSR	HOME UNIT	PR NO
ARIZONA PUBLIC SERVICE CO	PV-			SR	9571	003821

DO NOT DELIVER TO BECHTEL	REQUIRED INVOICE APPROVALS AND STA NO	PO $ LIMIT (BLANKET P.O.)	TYPE	STATUS
APS/PVNGS OPERATIONS STA. 4015 6320				
4 MILES S. WINTERSBURG, AZ 85343		BUYER NAME (IF KNOWN)	PR DATE	DATE NEEDED
MATERIAL MGT EXT 2426 STA 4015 6320	REQUESTOR LAST NAME, STA NO & EXT NO: R.E. Shultz 6310x6019		06-07-83	07-07-83

VENDOR NAME AND ADDRESS:
Power tool & Supply Co.
725 W. Madison Ave. (Harry)
Phoenix, Az. 85036

NOT BEFORE (MMDDYY)	REQUIRED BY (MMDDYY)	VENDOR NO.	TR DIS	CO NO.	STRM	FOB	SHIP VIA	SOLE SOURCE	TOTAL PR INTENDED USE (IF APPLICABLE)
				50				☐ YES ☒ NO	Special tools, all units

MIP NO.	QUOTE NO.	BUYER NO.	INTERIM EXPEDITE DATES (MMDDYY)	DATE OF P.O.	USER LAST NAME, STA NO & EXT NO

LINE NO.	ACCT / WORK ORDER NO.	SUB LEDG / JOB ORDER	CHARGE UNIT	TOC	ALLO %	DESCRIPTION (MAXIMUM 60 CHARACTERS PER LINE - TOTAL 180 - INCLUDING SPACING)	INTENDED USE (THIS LINE NO. ONLY)	STR LVL	HANDLE
1	99-152080		9571	003		#650 High speed helical high spiral taper pin reamers. Cleveland twist drill part #24236 (Do not substitute)	Special tools, all units	B	N/A
1	99-152080		95.71	003		#650 High speed helical high spiral taper pin reamers. Cleveland twist drill part# 24237 (Do not substitute)	Special tools, all units	B	N/A
1	99-152080		95.71	003		#650 High speed helical high spiral taper pin reamers. Cleveland twist drill part #24238 (Do not substitute)	Special tools, all units	B	N/A

LOAD	CLASS	ITEM	U/I	ORDER QTY.	UNIT PRICE	0 0 0 0	E
				2			

R	TAX	TERM	DESCRIPTION (FOR PURCHASING ONLY - 25 CHAR. MAX.)

APPROVAL SIGNATURE(S) MUST MEET ALL REQUIREMENTS OF PURCHASING REQUEST AUTHORIZATION AND REVIEW SCHEDULE (SEE OPERATING INSTRUCTIONS 510-09-01 (Exhibit E) FOR DETAILS.

PRE-APPROVAL INITIAL(S) 1	2	3	4	5	6	BUYER SIGNATURE	PURCHASING APPROVALS

OPERATIONS ENGINEERING	DATE	MAINTENANCE ENGINEERING	DATE	OPR QUALITY ASSURANCE DEPT.	DATE	NON SPECIFIED REVIEW	DATE
R.E. Shultz 6-21-83							

APS 522-01G (3/82) REVIEWED BY (IF REQUIRED)/DATE | CONCURRENCE (IF REQUIRED)/DATE | AUTHORIZED BY | DATE

$450.00 PR COST ESTIMATE

REQUESTOR → MATERIALS MGT. → REQUESTOR (FILE COPY)

APS. ARIZONA PUBLIC SERVICE CO.
PALO VERDE NUCLEAR GENERATING STATION

PURCHASE REQUEST (PR) CONTINUATION PAGE

P.O. NO (SAME AS 1st PAGE)	PR NO (SAME AS 1st PAGE)	PAGE
	003821	2 of 3

LINE NO	ACCT / WORK ORDER NO	SUB LEDG / JOB ORDER	CHARGE UNIT	TOC	ALLO%	DESCRIPTION (MAXIMUM 60 CHARACTERS PER LINE; TOTAL 180 - INCLUDING SPACING)	INTENDED USE (THIS LINE NO ONLY)	STR LVL	HANDLE
1	99-152080		95.71	003		#650 High speed helical high spiral taper pin reamers. Cleveland twist drill part #24239 (Do not substitute)	Special tools, all units	B	N/A
1	990152080		95.71	003		#650 high speed helical high spiral taper pin reamers Cleveland twist drill part #24240 (Do not substitute)	Special tools, all units	B	N/A
1	99-152080		95.71	003		#650 High speed helical high spiral taper pin reamers Cleveland twist drill part #24241 (Do not substitute)	Special tools, all units	B	N/A
1	99-152080		95.71	003		#650 High speed ~~high~~ helical high spiral taper pin reamers Cleveland twist drill part #24242 (Do not substitute)	Special tools, all units	B	N/A
1	99-152080		95.71	003		#650 high speed helical high spiral taper pin reamers Cleveland twist drill part #24243 (Do not substitute)	Special tools, all units	B	N/A

LOAD	CLASS	ITEM	U/I	ORDER QTY	UNIT PRICE	0'0'0'0	E
				2			

R	TAX	TERM	DESCRIPTION (FOR PURCHASING ONLY - 25 CHAR. MAX.)

PV 522-01H (3/82)

REQUESTOR → MATERIALS MGT. → REQUESTOR (FILE COPY)

ARIZONA PUBLIC SERVICE CO.
PALO VERDE NUCLEAR GENERATING STATION

PURCHASE REQUEST (PR) CONTINUATION PAGE

P.O. NO (SAME AS 1st PAGE)	PR NO (SAME AS 1st PAGE)	PAGE
	002821	3 of 3

Item 1

LINE NO	ACCT / WORK ORDER NO	SUB LEDG / JOB ORDER	CHARGE UNIT	TOC	ALLO %
1	99-152080		95.71	003	

LOAD	CLASS	ITEM	U/I	ORDER QTY.	UNIT PRICE	E
				2		

R / TAX / TERM / DESCRIPTION (FOR PURCHASING ONLY - 25 CHAR. MAX.):

DESCRIPTION (MAXIMUM 60 CHARACTERS PER LINE - TOTAL 180 - INCLUDING SPACING):
#650 High spedd helical high spiral taper pin reamers
Cleveland twist drill part #24244
(Do not substitute)

INTENDED USE (THIS LINE NO. ONLY): Special tools, all units
STR LVL: B | HANDLE: N/A

Item 2

LINE NO	ACCT / WORK ORDER NO	SUB LEDG / JOB ORDER	CHARGE UNIT	TOC	ALLO %
1	99-152080		95.71	003	

LOAD	CLASS	ITEM	U/I	ORDER QTY.	UNIT PRICE	E
				2		

R / TAX / TERM / DESCRIPTION (FOR PURCHASING ONLY - 25 CHAR. MAX.):

DESCRIPTION (MAXIMUM 60 CHARACTERS PER LINE - TOTAL 180 - INCLUDING SPACING):
#650 High speed helical high spiral taper pin reamers
Cleveland twist drill part #24245
(Do not substitute)

INTENDED USE (THIS LINE NO. ONLY): Special tools, all units
STR LVL: B | HANDLE: N/A

(Remaining three entry blocks blank: LINE NO / ACCT /WORK ORDER NO / SUB LEDG / JOB ORDER / CHARGE UNIT / TOC / ALLO % / LOAD / CLASS / ITEM / U/I / ORDER QTY. / UNIT PRICE / R / TAX / TERM / DESCRIPTION (FOR PURCHASING ONLY - 25 CHAR. MAX.) / DESCRIPTION (MAXIMUM 60 CHARACTERS PER LINE - TOTAL 180 - INCLUDING SPACING) / INTENDED USE (THIS LINE NO. ONLY) / STR LVL / HANDLE)

PV 522-01H (3/82)

REQUESTOR → MATERIALS MGT. → REQUESTOR (FILE COPY)

Arizona Public Service Company
PURCHASING DEPARTMENT, STATION 5763
P.O. BOX 21666 • PHOENIX, AZ 85036

PLEASE SUBMIT INVOICE ORIGINAL, ONE COPY AND FREIGHT BILL TO: ACCOUNTING DEPT., STA. 1640, P.O. BOX 21232, PHOENIX, AZ 85036

PAGE OF

PR	PO DATE	DELIVERY REQUIRED NOT BEFORE	DELIVERY REQUIRED REQUIRED BY	FOB	SHIP VIA	TRADE DISC.	NIP	PURCHASE ORDER NO.
3821	06/22/83		07/06/83	DEST	VENDOR	.0000		33202571

SHIP TO: ARIZONA PUBLIC SERVICE CO
DO NOT DELIVER TO BECHTEL
APS/PVNGS OPERATIONS STA. 632-
4 MILES S WINTERSBURG AZ 85343

TO: POWER TOOL & SUPPLY CO
P O BOX 21272
PHOENIX AZ 85036

REQUESTOR: H.E. SHULTZ 6310X6019
PV-NGS -NSR

NU SAFETY:

← QR = QUALITY RELATED NQR = NON QUALITY RELATED

QA REQUIREMENTS

LINE NO.	ESC-ALA-TION	TAX	CLASS	ITEM	U/I	ORDER QUANTITY	UNIT PRICE	DESCRIPTION
[illegible]		50	0822	257101	EA	2	[illegible] TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #24236-CONFIRMING ORDER TO HARRY DO NOT DUPLICATE
2		50	0822	257102	EA	2	11.6400 TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART# 24237 (DO NOT SUBSTITUTE)
3		50	0822	257103	EA	2	[illegible] TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #24238 (DO NOT SUBSTITUTE)
[illegible]		50	0822	257104	EA	2	14.3600 TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #24239 (DO NOT SUBSTITUTE)
[illegible]		50	0822	257105	EA	2	[illegible] TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #2424[illegible] (DO NOT SUBSTITUTE)
[illegible]		50	0822	257106	EA	2	[illegible].3800 TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #2424[illegible] (DO NOT SUBSTITUTE)
[illegible]		50	0822	257107	EA	2	[illegible] TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #2424[illegible] (DO NOT SUBSTITUTE)
10		50	0822	257108	EA	2	23.4400 TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #24243 (DO NOT SUBSTITUTE)
[illegible]		50	0822	257109	EA	2	27.[illegible] TERMS: NET 30	#850 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS. CLEVELAND TWIST DRILL PART #24244 (DO NOT SUBSTITUTE)

EXECUTIVE ORDER NO. 11246 DATED SEPTEMBER 24, 1965, AS AMENDED, IS INCORPORATED BY REFERENCE AND MADE A PART OF THIS ORDER.

THIS ORDER SHALL BE GOVERNED BY THE ARIZONA PUBLIC SERVICE COMPANY TERMS AND CONDITIONS ATTACHED TO OR REFERENCED IN THIS PURCHASE ORDER, IF ANY, AND THE UNIFORM COMMERCIAL CODE AS ADOPTED BY THE STATE OF ARIZONA EXCEPT TO THE EXTENT MODIFIED BY THE ATTACHED OR REFERENCED APS TERMS. TERMS CONTAINED IN OR A PART OF SELLER'S QUOTE BID/PROPOSAL THAT CONFLICT WITH SUCH APS TERMS OR UCC SHALL NOT BE A PART OF THIS ORDER EXCEPT TO THE EXTENT REPRODUCED IN THIS PURCHASE ORDER.

FOR QUALITY RELATED ORDER(S), VENDORS SHALL COMPLY WITH ALL APPLICABLE QUALITY ASSURANCE (QA) ATTACHMENTS TO THE ORDER(S). EACH QA ATTACHMENT IS ASSIGNED A TWO-DIGIT CODE. THE SPECIFIC ATTACHMENTS REQUIRED FOR EACH PURCHASE ITEM IS NOTED IN THE PINK FIELD AT THE END OF THE ITEM'S DESCRIPTION FIELD. FIELD MAY CONTAIN UP TO 5, TWO-DIGIT CODES.

VENDOR INSTRUCTIONS

1. PLEASE SHOW P.O. NO. ON ALL PACKAGES, INVOICES, SHIPPING PAPERS, FREIGHT BILL AND CORRESPONDENCE.
2. PLEASE SUBMIT INVOICE ORIGINAL, ONE COPY AND FREIGHT BILL TO ACCOUNTING DEPT., STA. 1640, P.O. BOX 21232, PHOENIX, AZ 85036.
3. PLEASE SHOW CLASS & ITEM NO. FOR EACH ITEM ON YOUR INVOICE WHEN APPLICABLE.
4. FOR EXPLANATION OF TAX CODES SEE BACK OF FORM

ARIZONA PUBLIC SERVICE COMPANY

QUALITY ASSURANCE DEPT. REVIEW

X [signature]
BUYER SIGNATURE

THIS PURCHASE ORDER INVOLVES PARTICIPANTS - SEE BACK OF FORM

VENDOR NO. ▶

TOTAL COST	
3267.[illegible]	
BUYER NO.	QUOTE NO.
22	

APS. Arizona Public Service Company
PURCHASING DEPARTMENT, STATION 5763
P.O. BOX 21666 • PHOENIX, AZ 85036

PLEASE SUBMIT INVOICE ORIGINAL, ONE COPY AND FREIGHT BILL TO: ACCOUNTING DEPT., STA. 1640, P.O. BOX 21232, PHOENIX, AZ 85036

PURCHASE ORDER (PO)

PAGE OF

PR 3821

PO DATE	DELIVERY REQUIRED NOT BEFORE	DELIVERY REQUIRED REQUIRED BY	FOB	SHIP VIA	TRADE DISC.	NIP	PURCHASE ORDER NO.
06/22/83		07/06/83	DEST		.0000		33202571

SHIP TO: ARIZONA PUBLIC SERVICE CO
DO NOT DELIVER TO BECHTEL
APS/PVNGS OPERATIONS STA. 6320
4 MILES S WINTERSBURG AZ 85343

TO: POWER TOOL & SUPPLY CO
P O BOX 21272
PHOENIX AZ 85036

REQUESTOR: R.E. SHULTZ 6310X6019
PV-NGS -NSR
QR = QUALITY RELATED NQR = NON QUALITY RELATED

LINE NO.	ESCALATION	TAX	CLASS	ITEM	U/I	ORDER QUANTITY	UNIT PRICE	DESCRIPTION	QA REQUIREMENTS
01		50	2822	257510	EA	2	50.3630 TERMS: NET 30	#650 HIGH SPEED HELICAL HIGH SPIRAL TAPER PIN REAMERS CLEVELAND TWIST DRILL PART #24245-CONFIRMING ORDER-TO HARRY DO NOT DUPLICATE	
							TERMS:		
							TERMS:		
							TERMS:		
							TERMS:		
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							TERMS:		
							TERMS:		

EXECUTIVE ORDER NO. 11246 DATED SEPTEMBER 24, 1965, AMENDED IS INCORPORATED BY REFERENCE AND MADE PART OF THIS ORDER

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VENDOR INSTRUCTIONS

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2. PLEASE SUBMIT INVOICE ORIGINAL, ONE COPY AND FREIGHT BILL TO ACCOUNTING DEPT., STA. 1640, P.O. BOX 21232, PHOENIX, AZ 85036.
3. PLEASE SHOW CLASS & ITEM NO. FOR EACH ITEM ON YOUR INVOICE WHEN APPLICABLE.
4. FOR EXPLANATION OF TAX CODES, SEE BACK OF FORM.

ARIZONA PUBLIC SERVICE COMPANY

QUALITY ASSURANCE DEPT. REVIEW

X BUYER SIGNATURE

THIS PURCHASE ORDER INVOLVES PARTICIPANTS - SEE BACK OF FORM

VENDOR NO.

TOTAL COST	
[illegible]	
BUYER NO.	QUOTE NO.
22	

PALO VERDE NUCLEAR GENERATING STATION MANUAL	PROCEDURE NO. 31MT-92203	
HORIZONTAL ROTATING EQUIPMENT ALIGNMENT	REVISION 0	Page 1 of

Truman
Rejected Jon Wright
- rewrite
Jon

This was written in
draft form in August 1983.
RK Nelson 10/12/83
JD Hayes 10/13/83

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BY	DATE	SUBJECT	SHEET NO. 1 of
CHECKED BY	DATE	3IMT-9LE03	JOB NO.

1.0 PURPOSE

1.1 To provide general instructions for alignment of horizontally mounted rotating equipment.

1.2 To describe alignment tasks such as:

1.2.1 Foundation plate check
1.2.2 Coupling hub removal and replacement
1.2.3 Soft feet check
1.2.4 Rough alignment
1.2.5 Fine alignment
1.2.6 Doweling.

1.3 May be used for routine maintenance or full alignment.

1.4 May be supplemented or superseded by manufacturer's Technical Manuals.

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BY	DATE	SUBJECT	SHEET NO. 2 of
CHECKED BY	DATE		JOB NO.

2.0 REFERENCES

2.1 Implementing References

2.1.1 30AC-9ZZ01, Work Control
2.1.2 40AC-0ZZ05, Station Tagging and Clearance
2.1.3 60AC-0ZZ05, Inspection Requirements for Maintenance and Modification of Plant Equipment
2.1.4 75RP-9ZZ449, Radiation Exposure Permit

2.2 Developmental References

None

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BY	DATE	SUBJECT	SHEET NO. 3 OF
CHECKED BY	DATE		JOB NO.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Soft Feet- Those mounting feet at the base of a motor, engine, pump, turbine, etc that, due to being cracked, bent, uneven, or otherwise misshaped, could cause misalignment of coupled rotating equipment.

3.2 Offset Misalignment— Misalignment that occurs when coupling hub faces are parallel but do not have a common centerline.

3.3 Angular Misalignment— Misalignment that occurs when coupling hub faces are not parallel and may or may not have a common centerline.

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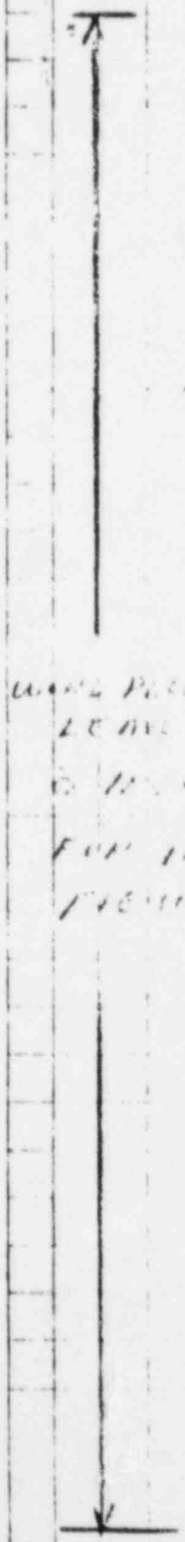
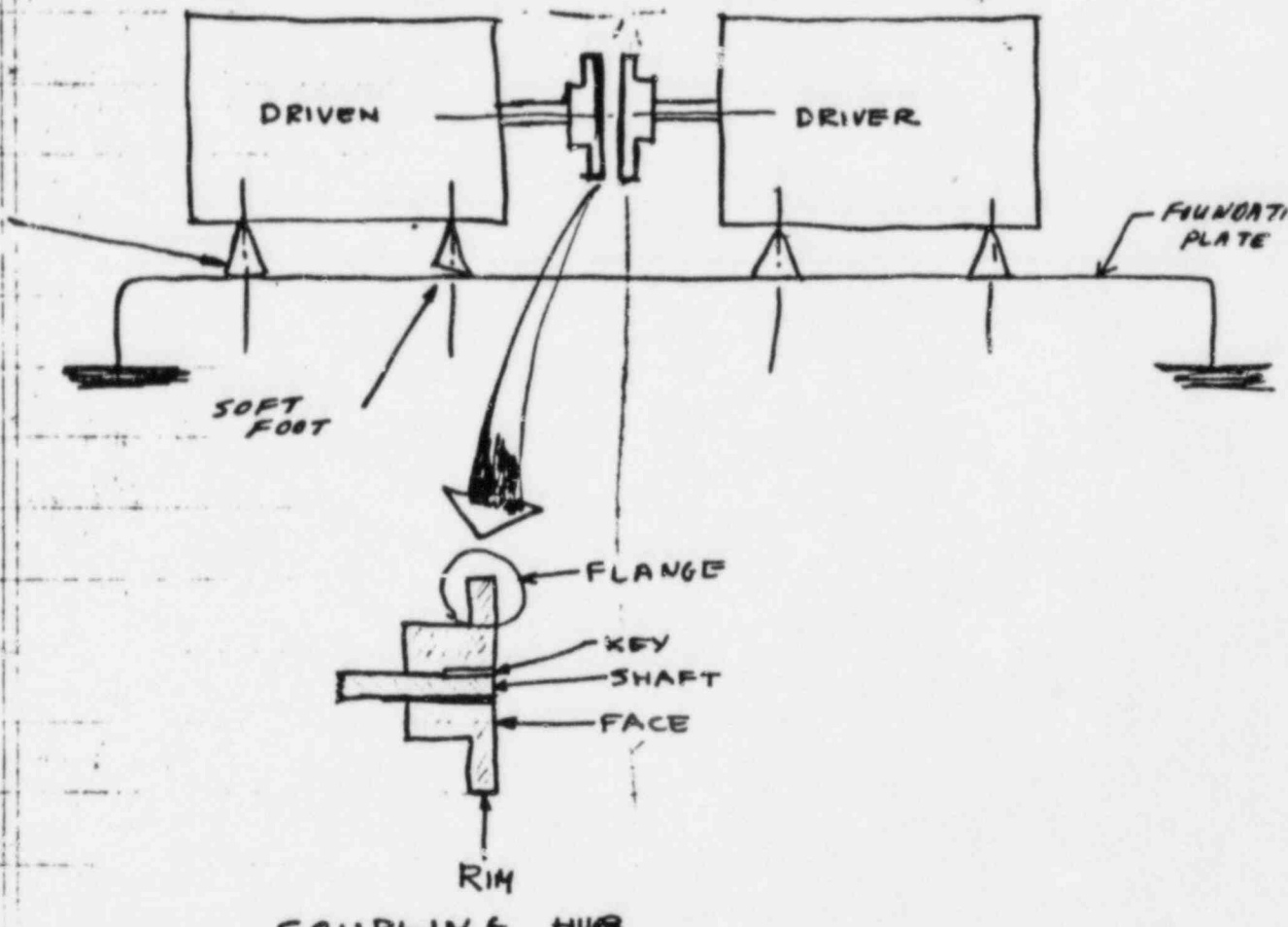
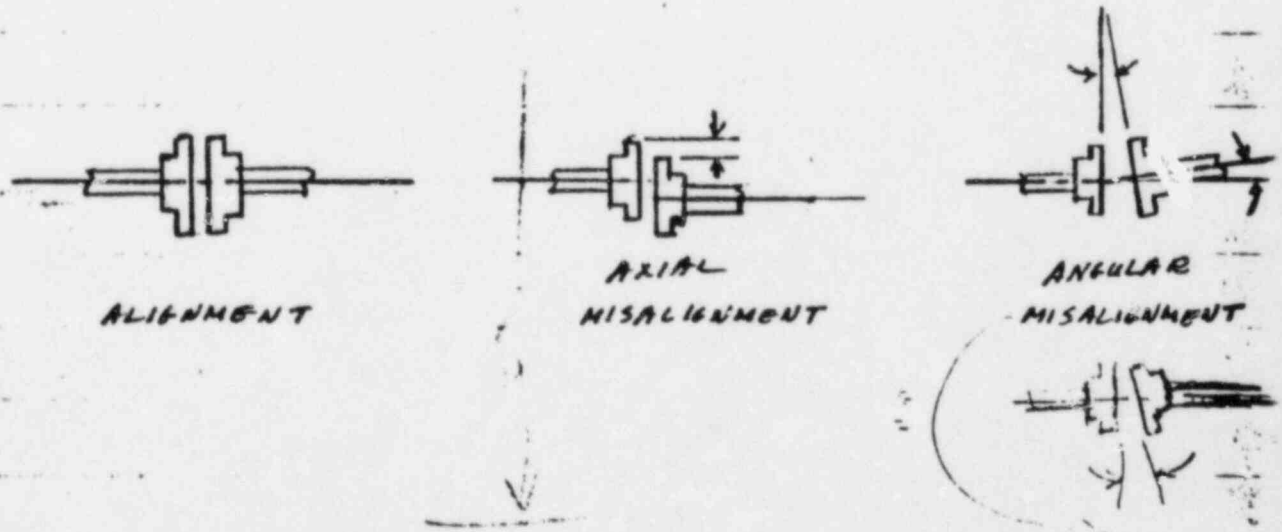
BY	DATE	SUBJECT	SHEET NO. 4 of
CHECKED BY	DATE		JOB NO.

3.4 Nomenclature Used



3.4 Nomenclature Used





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BY	DATE	SUBJECT	SHEET NO. 5 of
CHECKED BY	DATE		JOB NO.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Ensure equipment has been properly tagged out in accordance with 40AC-0Z205, Station Tagging and Clearance, before starting alignment task.

4.2 If safety related or quality related equipment is involved, comply with the independent inspection requirements of 60AC-0Z205, Inspection Requirements for Maintenance and Modification of Plant Equipment.

4.3 If applicable, comply with radiological restrictions as required in 75RP-0Z144, Radiation Exposure Permit

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BY	DATE	SUBJECT	SHEET NO. 6 of
CHECKED BY	DATE		JOB NO.

5.0 PREREQUISITES / INITIAL CONDITIONS

5.1 Work Control Package processed in accordance with 30AC-9ZZ01, Work Control.

5.2 Rotating equipment isolated, deenergized, and tagged out in accordance with 40AC-0ZZ05.

5.3 If applicable, maintenance personnel covered by an active Radiation Exposure Permit (REP).

5.4 Measuring and Test Equipment (M&TE) being used is labeled with valid PVNGS MT&E label that is within its due date.

5.5 Alignment data from manufacturer's Technical Manuals, or Plant Technical Manual on hand and reviewed for requirements and specifications for the equipment involved.

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BY	DATE	SUBJECT	SHEET NO. 7 of
CHECKED BY	DATE		JOB NO.

6.0 RESOURCES REQUIRED

6.1 Manpower

Two maintenance personnel, one of whom is qualified to the journeyman level

6.2 Material / Equipment

The following material / equipment, or equivalent, available for use

(1) approved solvent
(2) aporved lubricants
(3) standard dowels and lifting nuts
(4) tempsticks
(5) clean rags
(6) steel strapping, 1/4inch x 2inch
(7) assorted wedges
(8) keystock
(9) shim stock
(10) hardwood blocks
(11) crocus cloth
(12) soft faced mallet
(13) wire brush
(14) mill file
(15) thread taps
(16) coupling hub pullers
(17) stubby hydraulic jack, 5 ton cap
(18) 2 gas heating torches with tanks
(19) powdered chemical fire extinguisher
(20) feeler gages
(21) rat tail file
(22) drill and bits
(23) grinder and wheels
(24) machanics level
(25) metal straight edge
(26) torque wrench
(27) strap wrench
(28) reamers
(29) weld rod oven
(30) hot oil bath
(31) tin snips
(32) flash light
(33) extension mirror
(34) felt tip pen
(35) taper gages
(36) metal scribe
(37) combination end wrenches
(38) dial indicators
(39) dial indicator mounting hdwe
(40) approved rigging

APPENDIX D

TAPER DOWEL PIN DATA SHEET

1. Standard taper is 1/4 inch per foot.
2. Threaded (NF thread) approximately 1-3/8 inch length at major diameter.
3. Steel _____, Rockwell Hardness _____
4. Standard sizes:

_____

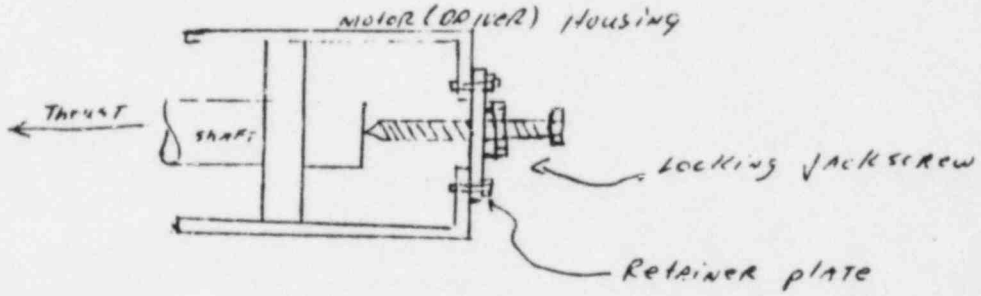
_____

_____

_____

APPENDIX C

THRUST BRACKET DATA SHEET

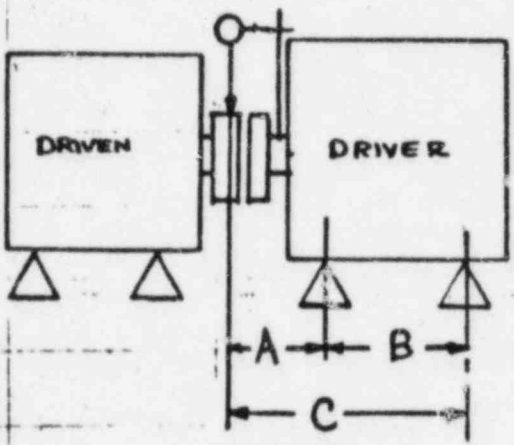


SOFT FOOT DATA SHEET

INDICATOR READING (STEP 8.4.2)

Foot a _____
Foot b _____
Foot c _____
Foot d _____

NOTE: IF INDICATOR READING IS LESS THAN 0.002, SHIM REQUIREMENT IS NOT APPLICABLE



DISTANCE READING (STED 8.4.3)

A = _____
B = _____
C = _____

CALCULATIONS (STED 8.4.4)

(FOR SHIMS) a & b = $\frac{\text{DISTANCE B} \times \text{INDICATOR READING FOR THAT FOOT}}{\text{DISTANCE A}}$

(FOR SHIMS) c & d = $\frac{\text{DISTANCE B} \times \text{INDICATOR READING FOR THAT FOOT}}{\text{DISTANCE C}}$

SHIM THICKNESS NEEDED (STED 8.4.5)

Foot a _____
Foot b _____
Foot c _____
Foot d _____

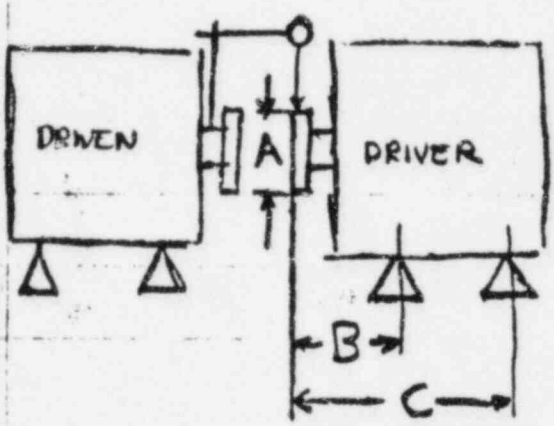
APPENDIX A

ALIGNMENT READINGS DATA SHEET

STEP 8.3.6, MANUFACTURER'S COUPLING GAP _____

STEP 8.3.7.4, SHAFT THRUST - _____

STEP 8.3.8, ACTUAL COUPLING GAP _____



STEP 8.5.6.1 A - _____

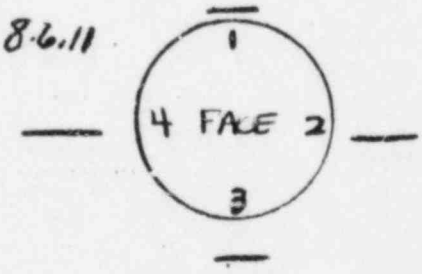
STEP 8.5.6.2 B = _____

STEP 8.5.6.3 C = _____

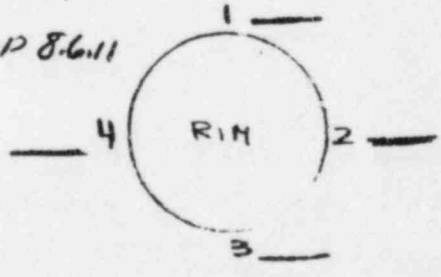
STEP 8.5.6.4 FRONT FOOT RATIO $\frac{B}{A}$ = _____

STEP 8.5.6.5 REAR FOOT RATIO $\frac{C}{A}$ = _____

STEP 8.6.11



STEP 8.6.11



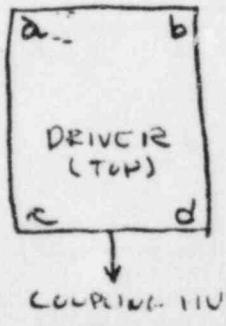
STEP 8.6.12 Final Shim Thickness, Number

Foot a _____, _____

Foot b _____, _____

Foot c _____, _____

Foot d _____, _____



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BY	DATE	SUBJECT	SHEET NO. 28 of
CHECKED BY	DATE		JOB NO.

8.7 Doweling

8.7.1 Check driver-driven equipment alignment after the equipment has been operated at design pressures and temperatures for eight (8) hours. Realign as necessary.

NOTE

Select taper dowel pins of a size compatible with size of equipment being doweled See datasheet of Appendix D for taper dowel pin information

8.7.2 On diagonally opposite feet of both driver and driven equipment (4 places), drill thru feet and into foundation plate to desired depth. Holes must be 1/16 inch less in diameter than minor diameter of selected taper dowel pins. Clean out chips

8.7.3 Ream the holes in the feet and foundation plate to the proper diameters for the taper dowel pins (light push fit). Clean out chips.

8.7.4 Coat taper dowel pins with a light coat of LATER and install in reamed holes.

8.7.5 Provide proper sized nut for pulling taper dowel pin when the need arises

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BY	DATE	SUBJECT	SHEET NO. 29 of
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9.0 RESTORATION

9.1 Coupling Installation

9.1.1 Assemble coupling, fill with prescribed lubricant and torque coupling bolts to manufacturer's specifications

9.1.2 Install coupling guard

9.1.3 Attach appropriate data sheets to Work Control Package.

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BY	DATE	SUBJECT	SHEET NO. 27 of
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8.6.6.2 For the rear feet —

$$\text{Shim thickness} = \text{rear foot ratio (8.5.6.5)} \times \text{TIR face (8.5.8.2)} + \frac{\text{TIR rim (8.5.8.3)}}{2}$$

8.6.7 Fabricate required shims. Use least number of shims possible

8.6.8 Loosen one (1) driver mounting bolt, add the necessary shims, then tighten the bolt. Repeat the process for the remaining three (3) bolts.

8.6.9 Repeat step 8.6.5. If not within specifications, repeat steps 8.6.4 thru 8.6.8

8.6.10 Loosen driver mounting bolts one at a time, replace lockwashers, and torque mounting bolts to manufacturer's specifications

8.6.11 Repeat step 8.6.5 and record readings (face and rim on data sheet of Appendix A.

8.6.12 Record thickness of shims under each foot and the number of shims used under each foot on data sheet of Appendix A.

8.6.13 Remove measuring equipment and associated alignment materials and equipment

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CHECKED BY	DATE		JOB NO.

NOTE

If using a fulcrum attachment (wiggler) for the face measurements, remember that wiggler readings taken directly from the face will give true readings but readings taken from the rear of the coupling hub will give reverse readings.

8.6.4 Rotate driver shaft 360° using strap wrench and check that dial indicators return to zero. If not at zero examine linkage and adjust as necessary.

8.6.5 Rotate both shafts 360° in 90° increments using strap wrenches. Note the indicator readings and check that indicators return to zero. If not at zero reexamine linkage

8.6.5.1 To check dial indicator readings, add the 90° and 270° face (or rim) readings with their plus(+) or (-) signs and compare the sum to the 180° face (or rim) reading. They should be equal.

8.6.5.2 If not equal, replace dial indicators.

8.6.6 Calculate the shim thickness required as follows:

8.6.6.1 For the front feet —

$$\text{Shim thickness} = \text{front foot ratio (8.5.4.4)} \times \text{TIR face (8.5.8.2)} + \frac{\text{TIR rim (8.5.8.3}}{2}$$

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CHECKED BY	DATE		JOB NO.

8.6 Final Alignment

NOTE

Two (2) dial indicators, one for face readings and one for rim readings, are normally used in final alignment. If only one (1) dial indicator is used, take face readings, remount dial indicator and take rim readings.

8.6.1 Mark each coupling hub at four (4) places, 90° apart on the rim. Use a felt tip marking pen.

8.6.2 Mount dial indicators perpendicular to the face and rim of the driver coupling hub. Ensure clamping devices are solid and clearance exists to allow coupling hubs and dial indicators to rotate 360°. Locate dial indicator buttons as close as possible to the same position on the coupling hub. If space is limited, mount one dial indicator 90° clockwise or counter clockwise from the other.

8.6.3 Compress dial indicator buttons to approximately one half the total travel and zero at top center of driver coupling hub.

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CHECKED BY	DATE		JOB NO.

8.5.8.3 Determine vertical rim reading by setting a machanics level or metal straight edge on top center of the driven coupling hub rim parallel with driven shaft and measure distance between driver coupling hub rim top center and level or straight edge bottom. Note the reading

8.5.9 To determine shim thickness needed for driver front feet, multiply TIR of vertical face measurement (step 8.5.8.2) by front feet ratio (step 8.5.6.4) and add vertical rim reading (step 8.5.8.3).

8.5.10 To determine shim thickness needed for driver rear feet, multiply TIR of vertical face measurement (step 8.5.8.2) by rear feet ratio (step 8.5.6.5) and add vertical rim reading (step 8.5.8.3).

8.5.11 Fabricate the required shim thicknesses using the fewest number of shims possible

8.5.12 Loosen one (1) driver feet mounting bolt and add required shims and retighten bolt.

8.5.13 Repeat the procedure of 8.5.12 for each of the other three (3) feet.

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CHECKED BY	DATE		JOB NO.

8.5.6.4 Divide distance B (step 8.5.6.2) by diameter A (step 8.5.6.1) to get the front foot ratio. Record ratio on data sheet of Appendix A

8.5.6.5 Divide distance C (step 8.5.6.3) by diameter A (step 8.5.6.1) to get the rear foot ratio. Record ratio on data sheet of Appendix A

8.5.7 If visual examination shows coupling hub face and rim vertical alignment is very close proceed to step 8.6

8.5.8 If visual examination shows coupling hub face and rim vertical misalignment perform the following:

8.5.8.1 Use feeler gage and determine vertical face readings at four (4) places 90° apart starting at top center (0°) Note the readings.

8.5.8.2 Calculate the Total Indicator Reading (TIR) by subtracting the top center reading from itself and from each of the other three (3) readings. The top center sum will be zero. Maintain the plus(+) and minus(−) signs of the other three (3) readings. Note the sum.

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BY	DATE	SUBJECT	SHEET NO. 22 of
CHECKED BY	DATE		JOB NO.

8.5.5.1 Loosen driver mounting bolts.

8.5.5.2 Using a spacer or feeler gages of the specified thickness (step 8.3.8), position the coupling hub faces parallel and flush with the spacer or gage

8.5.5.3 Using a metal straightedge or machinists level, adjust the coupling hub rims until the rims are lined up at 90° and 270°

8.5.5.4 Tighten driver mounting bolts.

8.5.6 Find the ratio pattern for the driver feet. (This ratio pattern will be used later in the procedure for calculation of shim thicknesses

8.5.6.1 Measure driver coupling hub flange diameter. Record as A on data sheet of Appendix A

8.5.6.2 Measure distance from driver coupling hub face to driver front foot mounting bolt centerline Record as B on data sheet of Appendix A

8.5.6.3 Measure distance from driver coupling hub face to driver rear foot mounting bolt centerline Record as C on data sheet of Appendix A

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BY	DATE	SUBJECT	SHEET NO. 21 of
CHECKED BY	DATE		JOB NO.

8.5 Rough Alignment

8.5.1 Determine alignment specifications from applicable Technical Manual

8.5.2 Determine coupling gap if not previously determined (step 8.3.8).

8.5.3 From the applicable Technical Manual or from known data, calculate the vertical compensation requirements inherent in the equipment. The expansion of steels is roughly 0.0007 inch per inch per 100°F.

Example: With a known 200°F differential between an operating pump and motor whose cold shaft centerline is 40 inches above the common foundation plate, the equation is 0.0007 inch × 32 inches × 2 = 0.056 inch. This is the offset requirement to allow for expansion to bring shafts into required alignment when equipment is in the operational mode.

8.5.4 Fabricate and mount a thrust bracket on driver and set driver shaft at magnetic center (step 8.3.6). Design of thrust bracket is shown in Appendix C

8.5.5 Proceed with rough horizontal alignment as follows:

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CHECKED BY	DATE		JOB NO.

8.4.3.3 Add dimensions of distances A and B. This is distance C. Record on data sheet of Appendix B

8.4.4 To determine shim thickness needed to adjust soft feet, use the following calculations:

8.4.4.1 For rear feet shim requirements, the equation is:

$$\text{Shim thickness} = \frac{\text{Distance B} \times \text{Indicator reading for that foot}}{\text{Distance A}}$$

Record results on data sheet of Appendix B

8.4.4.2 For front feet shim requirements, the equation is:

$$\text{Shim thickness} = \frac{\text{Distance B} \times \text{Indicator reading for that foot}}{\text{Distance C}}$$

8.4.5 Fabricate and install needed shims under each foot, one at a time. Use fewest number of shims possible. Record on data sheet of Appendix B.

8.4.6 Tighten driver mounting bolts.

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8.4.2 Determine soft feet - indicator readings as follows:

8.4.2.1 Tighten each driver mounting bolt

8.4.2.2 Mount a dial indicator perpendicular to the driven coupling hub rim at 12 o'clock. Ensure clamping device is solid, clearance exists for dial indicator, dial indicator is seated solid, and there is a smooth seat for the dial indicator button

8.4.2.3 Zero indicator and loosen one (1) driver mounting bolt. Record indicator reading on data sheet of Appendix B. Tighten bolt

8.4.2.4 Repeat step 8.4.2.3 for the other three (3) feet

8.4.3 Determine driver feet mounting bolt centerline distances to dial indicator centerline as follows:

8.4.3.1 Measure distance from dial indicator button centerline to bolt hole centerline of driver front foot - (foot closest to indicator). This is distance A. Record on data sheet of Appendix B.

8.4.3.2 Measure distance from driver front foot bolt hole centerline to bolt hole centerline of driver rear foot on same side of driver. This is distance B. Record on data sheet of Appendix B

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8.3.9 For driver that is not a motor, determine shaft running center from the appropriate Technical Manual and then perform step 8.3.7.

8.3.10 Ensure there is enough clearance between driver and driven coupling hubs to set gap determined in step 8.3.8 or 8.3.9.

8.4 Soft Feet Determination and Adjustment

8.4.1 To determine possible soft feet problems:

8.4.1.1 Rock driver on foundation plate. If there is movement, locate the soft feet. When no movement is noted, proceed to step 8.4.2

8.4.1.2 After locating soft feet, use feeler gages to measure gaps and shim accordingly

8.4.1.3 To determine whether shims are needed on diagonal corners, remove those mounting bolts and tighten the other two mounting bolts. Use feeler gages to determine whether one or both feet need shims. Shim accordingly.

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8.3.6 If not previously determined in step 8.3.2.1, determine manufacturer's coupling gap from appropriate Technical Manual and record on data sheet of Appendix A.

8.3.7 Mount a dial indicator perpendicular to the driver coupling hub face at top center.

8.3.7.1 Ensure clamping device is solid, clearance exists for dial indicator to function properly, dial indicator is seated solid, and there is a flat smooth seat for the dial indicator button

8.3.7.2 Compress button to approximately one half its total travel and zero dial indicator

8.3.7.3 Push driver shaft away from dial indicator to limit of shaft travel, zero dial indicator, then push shaft toward dial indicator until manufacturer's magnetic center mark (step 8.3.5.1) or scribe mark (step 8.3.5.2) is even with driver bell housing. Read dial indicator and record reading on data sheet of Appendix A

8.3.8 Subtract thrust reading (step 8.3.7.3) from manufacturer's coupling gap dimension (step 8.3.6) and record this on data sheet of Appendix A.

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8.3.4.2 Visually check driver coupling hub rim at top center (0°) relative to driven coupling hub rim at top center. Driver coupling hub rim must be even with or lower than driven coupling hub rim

8.3.4.2 If a visual check is not sufficient to determine the relative height of the rims, use a machinists level and feeler gages to determine relative rim positions

8.3.4.3 When driver coupling hub rim at top center is higher, without shims or with temporary shims used to rough set alignment, than driven coupling hub rim, inform foreman and proceed as instructed

8.3.5 Determine the magnetic center for a driver that is a motor as follows:

8.3.5.1 Visually locate manufacturer's magnetic center mark, when mark cannot be found, perform step 8.3.5.2

8.3.5.2 Bump motor and scribe the motor shaft where it extends thru the motor bell housing at the coupling hub end.

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CHECKED BY	DATE		JOB NO.

8.3.3 To correct for too little lateral movement it will be necessary to modify the equipment. Inform foreman of plan to do - one or more of the following:

8.3.3.1 Slightly file slots in the driver feet mounting holes in the direction needed. Use a rattail file.

8.3.3.2 Slightly enlarge driver feet mounting holes. Use drill and bit

8.3.3.3 Plug, redrill, and retap foundation plate tapped holes

8.3.3.4 File or grind mounting bolt shoulders that are causing interference. Do not remove metal to less than the thread root diameter

8.3.3.5 Modify foundation plate to slotted holes rather than tapped holes

8.3.4 Determine driver up and down (vertical) movement as follows:

8.3.4.1 Position driver shaft level and on common center line with driven shaft using machinists level and temporary shims under driver feet

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8.3.1.2 Check driven shaft for level condition. Use a machinists level. If shaft is not level, inform foreman and proceed as instructed.

8.3.2 Determine driver side-to-side (lateral) movement capability as follows:

8.3.2.1 Set driver shaft level using machinists level and temporary shims under driver feet

8.3.2.1 Set coupling hub faces parallel and separated by a distance equal to the manufacturer's coupling gap as stated in the manufacturer's Technical Manual. Use spacers, keystock, wedges, feeler gages etc

8.3.2.2 Keeping coupling hub faces parallel, move driver laterally to determine whether driver coupling hub flange will extend past driven coupling hub flange in each direction (at 90° and 270°)

8.3.2.2.1 If there is enough lateral movement, go to step 8.3.4

8.3.2.2.2 If there is not enough lateral movement, go to step 8.3.3

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8.2.2.4 Quickly move coupling hub to shaft. If it fits, quickly push coupling hub on shaft until metal strap bottoms on shaft end. Allow to cool naturally

8.2.2.5 If coupling hub does not fit, check for interference, reheat coupling hub, and repeat step 8.2.2.4

8.3 Preliminary Installation

8.3.1 Place driver on foundation plate. Leave mounting bolts loose to allow for driver positioning

NOTE

This procedure assumes the driven unit is fixed or piped into its system and is not mechanically moveable.

CAUTION

DO NOT USE A PIPE WRENCH ON A DRIVER OR DRIVEN SHAFT. TO ROTATE SHAFT USE A STRAP WRENCH

8.3.1.1 Rotate driver and driven unit shafts at least two(2) revolutions. This will get oil under the bearings and allow the units to seek thrust position

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8.2.1.3 Continue heating the coupling hub until it pops loose. Quickly remove coupling hub by pulling on coupling puller extension rods

8.2.1.4 Allow coupling hub and shaft to cool naturally to room temperature

8.2.1.5 Clean up coupling hub and shaft mating surfaces by removing nicks, gouges, and foreign material. Remove and clean up key. Lightly lubricate parts using approved lubricants and protect parts for reassembly

8.2.2 Install coupling hub as follows:

8.2.2.1 Construct a 1/4 inch thick by 2 inch wide by the OD of the coupling hub long and bolt the strap to coupling hub face, covering the shaft hole. The bolts (or threaded rods) should extend to be used for carrying handles

8.2.2.2 Degrease coupling hub, shaft, and key. Check key fit in coupling shaft and place key on shaft

8.2.2.3 Place coupling hub in a controlled hot oil bath or in a weld rod oven and heat to 275°F maximum. Monitor temperature

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8.1.5.2.2 If coupling hubs are interference fits and are not flush, go to step 8.2

8.2 Coupling Hub Removal and Installation

8.2.1 Remove coupling hub as follows:

8.2.1.1 Attach coupling puller to coupling hub and place hydraulic jack under the puller. Apply a reasonable load on the jack. The coupling hub should not move

CAUTION

TAKE CARE WHEN HEATING COUPLING HUBS TO AVOID BURNS AND POSSIBILITY OF FIRE. HAVE POWDERED CHEMICAL FIRE EXTINGUISHER AT HAND

NOTE

Do not overheat coupling hub. Limit temperature to 275°F. Use Tempstik to monitor temperature.

8.2.1.2 Rapidly heat coupling hub by moving two (2) gas heating torches in semicircular arcs around coupling hub outer surface. At the same time keep wet rags wrapped around shaft and close to coupling hub

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8.1.4 Bolting hardware and foundation plate prepared as follows:

8.1.4.1 No thread damage on mounting bolts. Replace as necessary

8.1.4.2 Sufficient bolt length. Replace as necessary

8.1.4.3 No burrs on bolts caused by lockwasher action. Remove burrs as necessary

8.1.4.4 Threads in foundation plate clean and free of burrs. Retap as necessary

8.1.4.5 Flatwashers not distorted (capped). Replace as necessary

8.1.4.6 Lockwashers removed and retained for final assembly

8.1.5 Driver and driven coupling hubs prepared as follows:

8.1.5.1 Grease, rust, burrs, and rolled edges removed

8.1.5.2 Coupling hubs faces set flush with driver and driven shafts

8.1.5.2.1 If coupling hubs are not interference fits and are not flush, set coupling hub faces flush with shafts and go to step 8.3

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CHECKED BY	DATE		JOB NO.

8.0 INSTRUCTIONS

NOTE

The following instructions apply to horizontally mounted rotating equipment.

8.1 Cleanup
Before starting the alignment, either perform or make sure the following tasks have been performed.

8.1.1 Pump (driven) isolated and motor (driver) power switch OFF with circuit breaker racked out

8.1.2 Coupling guard removed, coupling drained (if lubricated), and coupling removed

8.1.3 Foundation plate and driver feet prepared as follows:

8.1.3.1 Grease removed with approved solvent

NOTE

When removing metal, maintain flatness requirements of foundation plate mounting surfaces and feet bottoms.

8.1.3.2 Rust removed with wire brush

8.1.3.3 Burrs and rolled edges removed with mill file

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7.0 PERSONNEL ORIENTATION

7.1 Since this procedure is a general guide for horizontally mounted rotating equipment alignment, personnel responsibilities, overall time frame, and working environment will vary dependent on the specific work situation.

ROUTING AND TRANSMITTAL SLIP

Date 10/17/83

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. J. Young / J. Burdoin 1563	OCT 19	PM 12 49
2. R.V		
3.		
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Action	File	Note and Return
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FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Bill Albert, WNP-3	Phone No.

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
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FPMR (41 CFR) 101-11.206

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#110

UNITED STATES
NUCLEAR REGULATORY COMMISSION

Office of Inspection & Enforcement
P. O. Box 545
Elma, Washington 98541

October 17, 1983

MEMORANDUM FOR: Al Johnson, Region V

FROM: Bill Albert, WNP-3

SUBJECT: PALO VERDE ENFORCEMENT FOLLOW-UP

A couple of points that you may wish to look into during your enforcement follow-up visit to Palo Verde:

1. Bolting Motor Control Centers

Crane's finding relates chiefly to bolting problems between the base of the MCCs and the surrounding cabinet, as we discussed last week. However, Crane also mentioned that he had a question with regard to the bolting between the MCC and the base itself. Burdoin has Crane's write-up and should be able to shed further light on this. Seems to me the bolting of MCC to base is more critical than the base-to-cabinet bolting.

As I noted, the GE drawings are typically careless in their attention to detail. This should be mentioned in the report itself; perhaps in the citation also.

2. Doweling of Motors

Although our last (10/14) conversation with W. Ide of APS would indicate that the seriousness of this finding has been mitigated by the fact the maintenance organization did (eventually) plan to do something, I believe there is a disconnect between what these people are doing and the startup/operating organization. This item may be another example of that disconnect. For example, how could that work have been accomplished in time for the originally planned startup this fall? One of our other problems was that the tagging system showed maintenance was to do something about the HPSI-A manual operator, but this was simply the observation of the man who hung the tag, and there was no cross reference to the actual maintenance work ordered. (Ordered following CAT observations on 9/7/83.)

Copy to: Young/Burdoin

#110

403-00A

ARIZONA PUBLIC SERVICE COMPANY

PVNGS-JGS-M83-264

Prepared by: William B. Garrett

Reviewed by: Lee Clyde

Approved by: Jerry Self

DATE: September 20, 1983

TO: L.G. Papworth
Sta. # 6075

SUBJECT: Special Investigation 83-20:
1PSIAV470 Inoperability

File: 83-147-419

Swing Shift, September 7, 1983, Operations personnel discovered 1PSIAV470 ("A" HPSI Pump Suction Isolation Valve) inoperable due to disconnection of the operator from the valve. A Special Investigation has been conducted by personnel from the STA/ISE Group. The cause of the valve operator failure has been determined. Details of the determination and recommended corrective actions appear below.

Equipment Description

Valve 1PSIAV470 is a 10" rising stem gate valve manufactured by Borg-Warner Corp. The valve is manually operated with an assembly manufactured by the Roto Hammer Company. This operator allows "hammer blows" to be delivered to a valve by turning a large handwheel (~3 1/2 feet in diameter on 1PSIAV470) which is attached to a bridle and hammer through pipe extensions and universal and slip joint. The hammer contacts the anvil through a set of raised lugs. The anvil is bolted to the handwheel replacement adaptor which slips over the stem nut. The handwheel replacement adaptor is secured to the stem nut with a nut which has been secured with a lock wire or set screw. See Figure 1.

Damage Discovery

Due to an NRC Construction Assessment Team (CAT) request to perform radiography on a section of the "A" HPSI Pump suction piping, a clearance was prepared which would allow isolation and draining of the pipe section. When Operations personnel attempted to close 1PSIAV470 they found the operator (i.e. the bridle/hammer/anvil/handwheel replacement adaptor assembly) disconnected from the stem nut and therefore inoperable. Further investigation revealed that the operator was above, and hung up on, a section of Fire Protection System piping. The valve was closed by using a wrench on the stem nut and tagged in that position so the requested radiographic work could continue as scheduled. In addition, Maintenance was contacted to repair the operator.

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During disassembly of the operator, it was noted that the nut utilized to secure the handwheel replacement adaptor to the stem nut was missing. In addition, damage to the valve operator position indicator was noted. Finally, damage was noted on the Fire Protection System piping elbow upon which the operator had been resting and on Fire Protection System piping supports.

It should be noted that valve operator failure occurred with the valve approximately 1 1/2" from the full open position.

Damage Scenario

"Stackup" and location measurements of the Fire Protection System piping and 1PSIAV470 verify that interference between the valve operator and the piping elbow existed. This conclusion is further supported by a wear line on the elbow approximately 1/2" from the bottom of the elbow and by paint removal on the sides and edges of the hammer section of the valve operator.

During the opening of 1PSIAV470 (on 8/1/93) the valve operator was lifted past and above the Fire Protection System piping elbow through action of the rising valve stem. This conclusion is supported by the following evidence:

1. Damage (scratch marks) exists on the piping elbow on the bottom, side and top. These scratch marks form a sort of "trail" from the bottom to the top of the elbow such as would be made by a rotating, climbing device.

2. Paint damage exists on the bottom, edges, side and top of the hammer section known to have interference problems with the piping elbow.

3. Scratch marks exist on the inside of the top of the bridle and damage exists on the top of the valve stem indicating the stem was in contact with the top of the bridle and rotating against it. Without a handwheel replacement adaptor lock nut in place, the rising stem would be able to lift the operator off of the stem nut as the stem continued to rise during valve opening.

4. Hanger damage exists which indicates the Fire Protection System piping was lifted and pushed away from the rising valve operator.

Further opening of the valve was prevented through spring action of the Fire Protection piping lifting the operator off of the stem nut and then supporting it above the stem nut and not allowing stem nut/handwheel replacement adaptor engagement. This conclusion is supported by the following evidence:

1. As stated above, scratch marks exist on the top of the elbow and the bottom of the hammer indicating the hammer (i.e. operator) was turned while the elbow was supporting it.

2. No distress marks exist on the stem nut as would be expected if the rise of the operator was only due to action of the stem in the final

stages of operator removal and the stemnut and handwheel replacement adaptor were locking and unlocking (slipping over one another).

Finally, it is concluded that valve operation had not been attempted from August 1, 1983 to September 7, 1983 because of the condition of the Fire Protection System piping elbow and due to inspection of valve position logs. The elbow raised edges and piping adjacent to the elbow are rusty indicating that the joints had once leaked. This rust includes the main section of damage caused by the elbow/hammer interference indicating the damage is not "fresh".

In addition, the SI system PSE logs major valve movements. The last operation of 1PSIAV470 prior to September 7, 1983 was valve opening on August 1, 1983.

Conclusions and Recommendations

1. The failure mode of this operator indicates the operator was incorrectly assembled. This is apparent by the missing handwheel replacement adaptor nut and by the valve stem being too long to fit inside the operator and allow full valve travel.

Recommendations:

1.1 Startup should conduct a study to determine the extent of utilization of Roto Hammer operators of similar design to the one which failed (i.e. operators which enclose the stems of rising stem valves) at PVNGS.

1.2 In addition, Startup should conduct sampling to assure correct installation (i.e. handwheel replacement adaptor nut installation and security and correct stem length).

1.3 Startup should notify construction of problems found in order that problems of a similar nature are avoided in Units 2 and 3 at PVNGS.

1.4 STA/ISEG should contact INPO with complete failure information for dissemination to the industry.

1.5 Failure of this operator and the observed condition of the "B" HPSI Pump Suction Isolation valve as not fully open despite inability to obtain further valve stem travel indicates that verification of full stem travel capability on all rising stem manual valves should be performed. Startup should add this verification as a generic test for all safety related manually operated rising stem valves.

2. A root cause analysis into the failure of this valve operator was not performed by Maintenance or Startup. Root cause analysis should have been performed when the problem was reported (in accordance with 30AC-9ZZ01, Section 5.2.5) prior to repair in order to determine if maintenance or operating instructions need to be changed, if a design

change is required or if this failure carried any significance for other PVNGS equipment.

Recommendations

2.1 Maintenance and startup should assure that timely performance of root cause analysis are performed on safety related equipment in accordance with 30AC-9ZZ01, Work Control. Concern with continuation and completion of startup testing should not preclude the timely and accurate determination of equipment failure cause.

2.2 STA/ISEG should be notified as soon as possible of failures of this type(i.e. those which have generic failure indications) in order that it can properly evaluate the failure impact to PVNGS and the industry in a timely fashion.

3. Operators were inattentive to equipment condition during its operation and have been negligent in reporting observed deficiencies such as valve position indication not in agreement with valve position. During the failure of the 1PSIAV470 operator, noise of the operator moving the Fire Protection System sprinkler pipe surely was evident. Further, vibration and operational difficulty followed by free movement of the operator rather than operator security at the valves upper limit surely were felt.

In addition, the valve in the other loop is known by operators to have what they feel is incorrect position indication (the valve does not indicate full open when no further valve movement is obtainable). In fact, this investigation has revealed that the valves position indication is correct.

Recommendations

3.1 Operations should reemphasize the importance of attentiveness to equipment degradation and malfunction during its operation, attentiveness to equipment condition on the operators rounds and prompt reporting of any abnormal operation or indication so that it can be properly evaluated and corrected.

4. As previously stated in this report, it is clear that the HPSI Pumps' suction isolation valves have not been completely open when they were assumed to be so during startup testing. This could also be true of other valves identified by the study recommended earlier in 1.

Recommendations

4.1 Operations Engineering should independently review data and determine test results acceptability for testing on systems for which valves are found to be in positions other than that called for in the startup test procedure.

5. During the investigation poor housekeeping and equipment conditions were noted. The HPSI Pump rooms are generally unkempt. In addition, significant leakage of boric acid is in evidence on equipment and includes body to bonnet and packing leaks on valves, leakage by caps on vents and drains, leakage from HPSI Pump seal injection cyclone separators and leakage from HPSI Pump seal injection pipe attachments to the pump case. Some of this leakage is orange in color indicating it is causing oxidation of the material onto which it has leaked.

Recommendations

5.1 A general cleanup of the pump rooms and equipment should be conducted by Startup.

5.2 Needed repairs to leaking equipment should be identified by Startup and completed as quickly as possible.

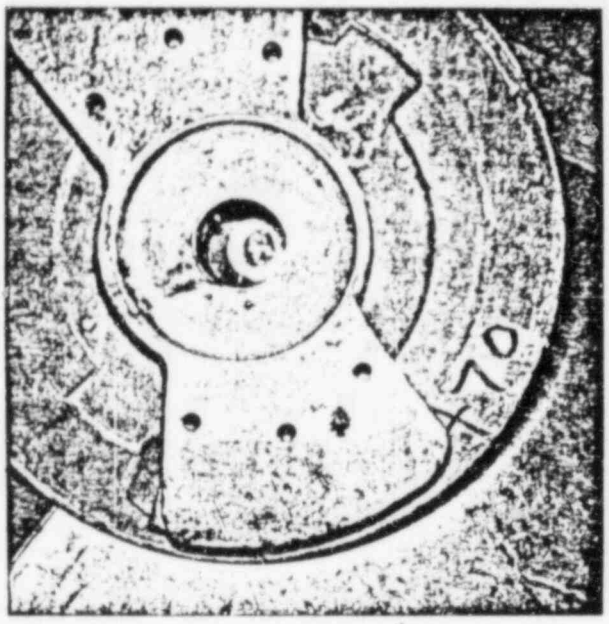
5.3 Specific attention should be directed to HPSI Pump seal injection piping support by Startup. This piping has screwed connections to the HPSI pumps, some of which show evidence of leakage, and can be shown to vibrate easily in the present configuration.

JS: C/WBG/mr

cc: J.R. Bynum
J.M. Allen
B.W. Gross
J.E. Kirby
R.K. Nelson

Interview Documentation Sheet

Friday, September 16, 1983:	Ron Younger (Ops) Stephen W. Ryan (Ops); prepared statement
Sunday, September 18, 1983:	Chris Crane (S/U) Jim Crews (Maintenance) Gary McGriff (Ops)

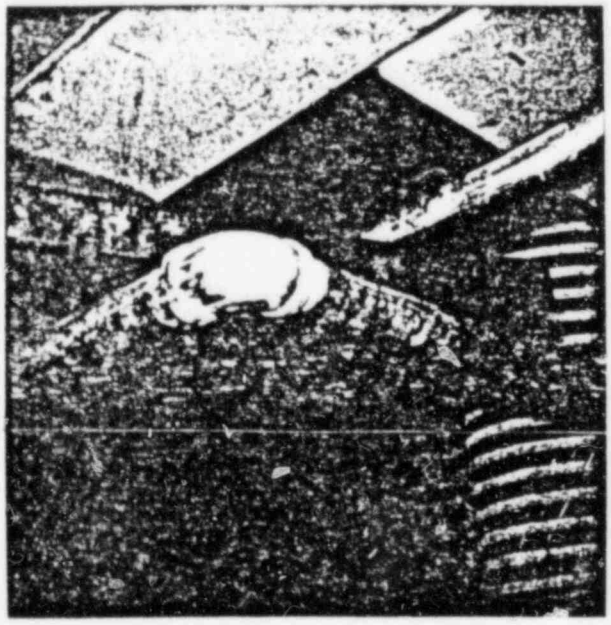


BOTTOM VIEW OF "ERIDLE" WITH HAMMER ATTACHED FROM 1RSIAV470

9/12/83

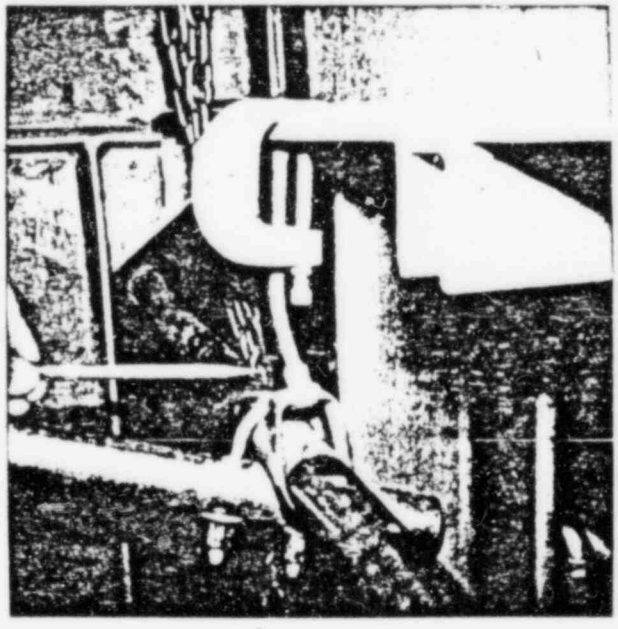
YOKE & OPERATOR OF 1RSIBV-1D2 ("B" 4PSI PUMP SUCTION VLV)

9/12/83



SPRINKLER PIPE WHICH HAD BEEN IN CONTACT WITH 1RSIAV470 OPERATOR

9/12/83



BENT PIPE HANGER ROD 1RSIAV470 - (SPRINKLER PIPE)

9/12/83

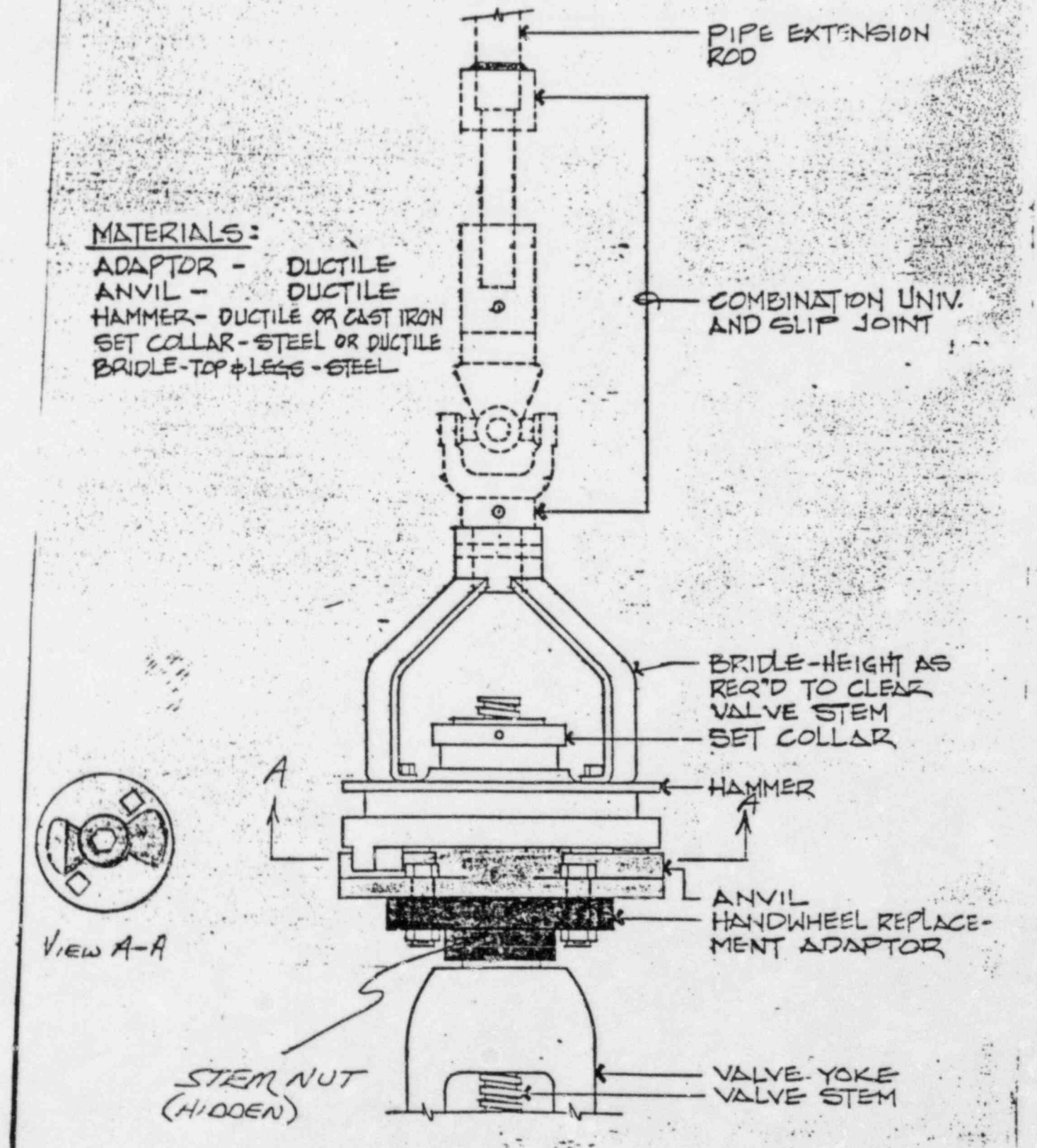

MATERIALS:
ADAPTOR - DUCTILE
ANVIL - DUCTILE
HAMMER - DUCTILE OR CAST IRON
SET COLLAR - STEEL OR DUCTILE
BRIDLE - TOP & LEGS - STEEL
PIPE EXTENSION ROD
COMBINATION UNIV. AND SLIP JOINT
BRIDLE - HEIGHT AS REQ'D TO CLEAR VALVE STEM
SET COLLAR
HAMMER
A
A
ANVIL
HANDWHEEL REPLACEMENT ADAPTOR
VIEW A-A
STEM NUT (HIDDEN)
VALVE YOKE
VALVE STEM

FIGURE 1