Design Specification
compliance with the requirements of the
Boiler and Pressure Vessel Code, Section
Nuclear Power Plant Components, 1974
tion, up to and including the Summer 1974
Sendn.

Registration No. 6382
State of Connecticut
Date 10/27/78

QA Status: Verified
The safety related design information contained in this document has been reviewed and satisfies (where applicable) the items contained on check list(s) ---, ---, and 6 of the Quality Assurance of Design Manual. This review is so certified.
Independent Reviewer L.W. Lyon
Date 10/16/78
Document Rev. No. -02-

PROJECT SPECIFICATION

FOR

SAFEGUARD PUMPS

FOR

KRIZHA NUCLEAR POWER PROJECT
UNITS 1, 2, 3, 4 AND 5

SPECIFICATION NO. 14273-PE-410, REV. 02

Nuclear Power Systems
COMBUSTION ENGINEERING, INC.
Windsor, Connecticut

Prepared by R.H. Hansen (Cognizant Engineer) Date 8/29/78

Approved by A.N. Mercier (Supervisor) Date 10/20/78

Approved by W.D. Warner (Application Engineer) Date 10/23/78

Approved by R.L. Rathbun (Project Manager) Date 10/27/78

Issue Date October 27, 1978

N001-11.05-5-#2

RECORD OF REVISIONS

NO.	DATE	PAGES INVOLVED	PREPARED BY	APPROVALS
00	6/25/75	ALL	M. Daika	A. H. Major A. Tuzes for C. Ferguson
01	2/26/76	ALL	D. R. Wade	A. H. Major M. A. Marroni C. Ferguson
02	10/27/78	All except Pages 3 & 4 of Data Sheets Verified this revision	R. H. Thomas	A. H. Major M. A. Marroni C. Ferguson

TABLE OF CONTENTS

LIST OF PROJECT SPECIFICATION ATTACHMENTS

1.0 SCOPE

1.1 This Specification together with CE General Specification No. SYS80-PE-410, Revision 03, constitute the requirements for Safeguard Pump Assemblies to be installed at Arizona Public Service Company, Palo Verde Nuclear Generating Station Unit Numbers 1, 2 and 3.

1.2 The criteria of the General Engineering Specification apply except as modified below under the same sub-heading or in the Project Specification Data Sheets.

2.0 ASSIGNMENT OF RESPONSIBILITY

2.2.2 Delete

3.0 APPLICABLE REFERENCES

3.1.1 Change to: ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components, 1974 Edition, up to and including Summer 1974 Addenda.

3.1.9 Change to: IEEE 344, 1975 Seismic Qualification of Class 1E Electric Equipment for Nuclear Generating Stations.

4.0 DESIGN REQUIREMENTS

4.2.1 Delete: and shall be inspectable in accordance with Code Class 2 of Reference 3.1.7.

Add: The jurisdictional boundary of Reference 3.1.1, Subsection NC shall be from the outboard terminations of the nozzle connections to the first non-integral support connection(s). The Code Class 2 jurisdictional pressure boundary parts shall include those specified in Subsection NC-3413 of Reference 3.1.1.

Add: Pump Assemblies shall be inspectable as required in Code Class 2 of Reference 3.1.7.

Add: The jurisdictional boundaries of Reference 3.1.1, Subsection NF shall be from the first non-integral support connection(s) through the bedplate-to-building structure interface. Bedplates shall be constructed to Subsection NF of Reference 3.1.1 to the requirements for the same Code Class as the pressure boundary involved.

Add: Design analysis of the supports shall be submitted that specifically addresses the NF building structure interfaces and define the loads at these points. Where a bedplate is provided the bedplate to building structure loads shall also be defined.

N001-11.05-5-F2

4.2.14 Delete

4.2.15 Delete: Data Sheet 26.16, Attachment 2. Substitute: Attachment 4.

4.2.16 Delete

4.2.17.2 Delete

4.4.1 Delete: 1 percent by weight NaOH
Substitute: 100 ppm N_2H_4.

4.4.2 Delete

4.5.4 Delete

7.0 DOCUMENTS TO BE FURNISHED BY SUPPLIER

7.4(b) Delete

7.5(b) Delete

7.6 Add: .(h) One complete set of radiographs (originals or copies).

8.0 DATA SHEET MODIFICATIONS

8.1 Data Sheet 1, Line 18, Change to read: Weld connections per Attachment 4.
Lines 13 and 15, Delete
Line 20, Change inlet piping to SCH20.

8.2 Data Sheet 2, Delete and Substitute: Attachment 1 (LPSI).

8.3 Data Sheet 3, Line 18, Change to read: Weld end connections per Attachment 4.
Lines 13 and 15, Delete
Line 20, Change inlet piping to SCH20

8.4 Data Sheet 4, Delete and Substitute Attachment 2 (HPSI).

8.5 Data Sheet 5, Change lines 6, 7, 10, 18 and 20 to read:

Rated Flow 3890 GPM including 150 GPM recirculation
Rated Head 505 feet. Shutoff Head: 640 ft min/690 ft max
Runout Flow (recirculation @ 300°F) 5000 GPM
Runout Head 300 Feet, min/460 feet max.
NPSH Available At rated flow: 20 feet At runout flow: [illegible]
Weld End Connections per Attachment 4
Connecting Piping: Inlet 14" SCH20, Discharge 8" SCH60S
The formula for the system resistance curve described in Paragraph 4.2.3 is:
H (ft) = 196 ft. + 1.30×10^{-5} ft/gpm^2 x GPM^2
Lines 13 and 15, Delete

8.6 Data Sheet 6, Delete and Substitute Attachment 3 (Containment Spray).

9.0 ATTACHMENT MODIFICATIONS

9.1 Attachment 2, Delete and Substitute Attachment 4 (Weld End Preps).

A001-11.05-57, 2

PROJECT ARIZONA NUCLEAR POWER PLANT - Low Pressure Safety Injection
SERVICE A-C ELECTRIC MOTOR DATA

1	Data By Purchaser
2	Motor Type: Squirrel-cage, induction
3	
4	Class: 1E Quantity: 2 per Plant Site
5	Nema Design: B Enclosure: Weather Protected Type II
6	Volts: 4160 Phase: 3 Frequency: 60Hz ± 5% Service Factor: 1.0
7	Orientation: Vertical Elevation: less than 1000 ft.
8	Insulation Classification: B Bearings: Anti friction thrust
9	Accessories
10	Space Heaters: yes, w/installed spare Volts: 120 Phase: Single
11	Temperature Detectors
12	Stator: None
13	Bearings: Hole Provided for temperature detector
14	Terminal Boxes
15	Main: NEMA Type 4 Size: 14x14x42 Top Entry - 4" Conduit
16	Instrumentation None
17	Space Heater: NEMA Type 4 Size:
18	Vendor should supply dimensions of two boxes on motor O/L dwg.
19	Environmental Conditions Compliance with IEEE 323
20	Temperature: 104°F normal/max.- 1 accident 120°F decaying to 104°F in 24 hrs
21	Pressure: ATH.
22	Radiation: 1×10^6 Rads
23	Chemical: Not applicable
24	Humidity: 20-100%
25	
26	Seismic Category: 1-1.5G in each of two horizontal directions.
27	Minimum Volts to Accelerate Load to Rated RPM:
28	Maximum Acceleration Time: 6 seconds based on
29	75% of rated at motor terminals increasing linearly to
30	first 2 seconds and increasing to 100% of rated in the next 4 seconds.
31	
32	
33	
34	N001-11.05-5-A2

No.	Line Changed	Date	By

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PROJECT Arizona Nuclear Power Plant-Low Press ty Safety Injection Pump
SERVICE A-C ELECTRIC MOTOR DATA

35 Temperature Rise: 60°C Method: Resistance
36 Noise Level Requirements: 90 dba @ 5 feet.
37 Locked Rotor Current: Not to exceed 6 times full load current. Motors shall have
38 a safe stalled rotor time which is longer than the accelerating time.
39
40
41 Grounding Pads: Delete 4.6.1 of Ref. 3.1.4 and substitute - two stainless steel
42 grounding pads welded to each motor with two holes drilled and tapped for 1/2" bolts
43 on 1-3/4" centers shall be provided.
44 Vibration Requirements: Hydraulic Institute when coupled with pump
45
46 Stators shall be submerged - tested in accordance with IEEE 429 Part 4.
47
48 Special Requirements: Insulation system shall be one of the following:
49 Westinghouse Electric Corp. (Thermoplastic-Epoxy)
50 General Electric Company (Poly-Seal)
51 Electric Machinery Mfg. Company (Sil-Clad)
52 Louis-Allis Company (Mica-Pac)
53 Allis Chalmers Mfg. Company (Silco-Flex)
54
55 The motor leads shall not be less than 4 ft. long when measured from the point where
56 they enter the terminal box. They shall be of extra flexible wire having silicone
57 or ozone-resistant rubber insulation. If braided jackets are used the braid shall
58 not be carried into the connection of the windings.
59
60 The connectors shall be API compression type terminal connectors of the proper size
61 for the motor leads and shall be furnished separately.
62
63 The first motor of a given manufacturer, HP, and frame size shall receive a complete
64 test plus additional tests of noise, vibration, insulation resistance, speed-torque
65 characteristics and shaft currents. Subsequent motors shall receive routine tests,
66 however if the enclosure is different an additional noise test shall be made.
67 Load Characteristics: Standard
68

No.	Line changed	Date	By

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PROJECT Arizona Nuclear Power Plant - Low Pressure Safety Injection Pump

SERVICE A.C. Electric Motor Data (1) ~~NOT ACCEPTABLE. WE NEED CERTIFIED DATA.~~

1	Data by Supplier Typical - Not Guaranteed				
2	Motor Mfgr: Westinghouse Electric Corporation			HP: 500	
3	Frame No.: 5010 - P39	Volts: 4160	Phase: 3	Service Factor: 1	
4	Nema Design: B		Enclosure: WP II		
5	Sync RPM: 1800	Full Load RPM: 1765 (2) ~~PREVIOUS DATA SHEET SHOWS 1766. PLEASE VERIFY.~~			
6	AMPS				
7	Full Load: 62.5		Locked Rotor: 383		
8	Torque				
9	Full Load: 1490		Pull Up % FL: 100		
10	Starting, % FL: 100		Breakdown, % FL: 220		
11	Efficiency				
12	Full Load: 93.2	3/4 Load: 93.6		1/2 Load: 93.3	
13	Power Factor				
14	Full Load: 92.5	3/4 Load: 91.9		1/2 Load: 88.7	
15	Insulation System(s)				
16	Nema Class: B				
17	Type: B Thermalastic Epoxy Sealed				
18	Mfgr: Westinghouse Electric				
19	Bearing:				
20	~~3. PLEASE ADD BECHTEL TAG NUMBER~~				
21	Bearings				
22	Thrust Type: Ang Contact Ball #7222 P03		Lubrication: Oil		
23	Guide Type: Guide #219 Ball		Lubrication: Oil		
24	Type:		Lubrication:		
25	Type:		Lubrication:		
26	Space Heaters Wrap around type				
27	Watts: 240	Volts: 120		Phase: 1	
28	Acceleration Time				
29	Minimum Volts; (3120) Approx. 4 sec.				
30	Rated Volts: (4160) Approx. 1 sec.				
31	Safe Locked Rotor Time: From 80°C - 5 sec. | from 30°C - 15 sec.				
32	Temperature Rise: 80°C		Method: Resist.		
33	Motor Wk²: 146		Motor Weight: 4600		
34					

PROJECT Arizona Nuclear Power Plant - Low Pressure Safety Injection Pump
SERVICE A. C. Electric Motor Data

Permissible Starts per Unit Time:

With rated voltage and freq. - within NEMA limits at motor terminals and with connected load inertia not exceeding 65 lb.ft^2

Motor Cold - 2 Consecutive Starts

Motor at Operating Temp - 1 Start

Other: Subsequent starts with motor running - between starts - 15 minutes apar

Subsequent starts with motor standing - between starts - 45 minutes apa

Expected natural Frequency - 40

Dimensions per DS 3240 Pg 26

Two sets of space heaters are supplied. Spaceheaters will operate at 240 volts for 5 seconds maximum.

PROJECT ARIZONA NUCLEAR POWER PLANT - High Pressure Safety Injection Pump
SERVICE A-C ELECTRIC MOTOR DATA

1	Data By Purchaser
2	Motor Type: Squirrel cage, induction
3	
4	Class: 1E — Quantity: 2 per Plant Site
5	Nema Design: B — Enclosure: Weather Protected Type II
6	Volts: 4160 Phase: 3 Frequency: 60Hz ± 5% Service Factor: 1.0
7	Orientation: Horizontal — Elevation: less than 1000 ft.
8	Insulation Classification: B — Bearings: Sleeve
9	Accessories
10	Space Heaters: yes, w/installed spare Volts: 120 Phase: Single
11	Temperature Detectors
12	Stator: None
13	Bearings: Chromel-alumel ungrounded within 1/8" of babbit metal
14	Terminal Boxes
15	Main: NEMA 4 — Size: 14x14x42 Top Entry - 4" Conduit
16	Instrumentation: Conduit Size:
17	Space Heater: NEMA 4 — Size: Threaded conn and drains 1" min.
18	Vendor should supply dimensions of three bores on motor O/L dwg.
19	Environmental Conditions compliance with IEEE 323
20	Temperature: 104°F normal/max. = 1 accident 120°F decaying to 104°F in 24hr
21	Pressure: ATM
22	Radiation: 1×10^6 Rads
23	Chemical: Not applicable
24	Humidity: 20 - 100%
25	
26	Seismic Category: 1-1.5G in each of two horizontal directions 1.0G vertical
27	Minimum Volts to Accelerate Load to Rated RPM: direction per IEEE 344
28	Maximum Acceleration Time : 5 seconds based on initial minimum volts
29	of 75% of rated at motor terminals increasing linearly to 90% of rated in the first
30	2 seconds and increasing to 100% of rated in the next 2 seconds.
31	
32	
33	
34	WOG-1105-5-42 — 10

Item	Date	By	
			DATA SHEET # 4 Page 1 of 4 Rev. 02

COMBUSTION ENGINEERING, INC.

PROJECT: Arizona Nuclear Power Plant - High Pressure Safety Injection Pump
SERVICE: A-C ELECTRIC MOTOR DATA

Temperature Rise: 80°C Method: Resistance

Noise Level Requirements: 90 dba @ 5 feet

Locked Rotor Current: Not to exceed 6 times full load current

Motors shall have a safe stalled rotor time which is longer than the accelerating time.

Grounding Pads: Delete 4.6.1 of Ref. 3.1.4 and substitute - Two copper grounding pads brazed to each motor with two holes drilled out and tapped for 1/2" bolts on 3-3/4" centers shall be provided.

Vibration Requirements: Hydraulic Institute when coupled with pump

Stators shall be submerged tested in accordance with IEEE 429 Part 4.

Special Requirements: Insulation system shall be one of the following:

Westinghouse Electric Corp. (Thermoplastic - Epoxy)
General Electric Co. (Poly-Seal)
Electric Machinery Mfg. Co. (Sil-Clad)
Louis-Allis Company (Hica-Pac)
Allis Chalmers Mfg. Company (Silco-Flex)

The motor leads shall not be less than 4 feet long when measured from the point where they enter the terminal box. They shall be of extra flexible wire having silicone or ozone-resistant rubber insulation. If braided jackets are used the braid shall not be carried into the connection of the windings.

The connectors shall be API compression type terminal connectors of the proper size for the motor leads and shall be furnished separately.

The first motor of a given manufacturer, HP, and frame size shall receive a complete test plus additional tests of noise, vibration, insulation resistance, speed-torque characteristics and shaft currents. Subsequent motors shall receive routine tests, however if the enclosure is different an additional noise test shall be made.

Load Characteristics: Standard NOOI-11.05-5-42 11

By	Engineer	Date	Yr

PROJECT: Arizona Nuclear Power Plant - High Pressure Safety Injection Pump
SERVICE: A.C. Electric Motor Data

1	Data by Supplier				
2	Motor Mfgr: Westinghouse Electric Corporation			HP: 1000	
3	Frame No.: 5810 H	Volts: 4160	Phase: 3	Service Factor: 1.0	
4	Nema Design: B		Enclosure: WP-2		
5	Sync RPM: 3600	Full Load RPM: 3557			
6	AMPS				
7	Full Load: 118		Locked Rotor: 709		
8	Torque				
9	Full Load: 1476 lb. ft.		Pull Up % FL: 83%		
10	Starting, % FL: 97%		Breakdown, % FL: 264%		
11	Efficiency				
12	Full Load: 94.8	3/4 Load: 94.9		1/2 Load: 94.3	
13	% Power Factor				
14	Full Load: 92.2	3/4 Load: 91.9		1/2 Load: 89.3	
15	Insulation System(s)				
16	Nema Class: B				
17	Type: B Thermalastic Epoxy				
18	Mfgr: Westinghouse Electric				
19	Bearing: Front Brg. insulated				
20					
21	Bearings				
22	Type: Split Sleeve		Lubrication: Oil		
23	Type:		Lubrication:		
24	Type:		Lubrication:		
25	Type:		Lubrication:		
26	Space Heaters				
27	Watts: 239	Volts: 120		Phase: 1	
28	Acceleration Time				
29	Minimum Volts: 3. sec. (Per PG.1 LNS. 28 to 30)				
30	Rated Volts: 1.5 sec.				
31	Safe Locked Rotor Time: 5.1 sec				
32	Temperature Rise: 80°C		Method: Resistance		
33	Motor Wk^2: 151.5 lb ft^2		Motor Weight: See Outline		
34					

PROJECT / SERVICE: Arizona Nuclear Power Plant – High Pressure Safety Injection Pump
A. C. Electric Motor Data

Permissible starts per Unit Time:

Motor Cold - 2 Consecutive Starts.

Motor at Operating temp. - 1 consecutive start

Subsequent starts with motor running between starts 15 minutes apart.

Subsequent starts with motor standing between starts. 45 minutes apart.

Other:

Bearing temp. detectors are chromel-alumel thermocouples.

Two sets of space heaters are supplied. Spaceheaters will operate at 240 volts for 5 seconds maximum

Permissible Starts per Unit Time:

With rated voltage and frequency – within NEMA Limits at motor terminals and with connected load inertia not exceeding 20 lb.ft^2.

PROJECT ARIZONA NUCLEAR POWER PLANT - Containment Spray Pump
SERVICE A-C ELECTRIC MOTOR DATA

1	Data By Purchaser
2	Motor Type: Squirrel cage, inductior
3	
4	Class: 1E Quantity: 2 per Plant Site
5	Nema Design: B Enclosure: Weather Protected Type II
6	Volts: 4160 Phase: 3 Frequency: 60Hz + 5% Service Factor: 1.0
7	Orientation: Vertical Elevation: less than 1000 ft.
8	Insulation Classification: B Bearings: Anti-friction thrust
9	Accessories
10	Space Heater: Yes, w/installed spare Volts: 120 Phase: Single
11	Temperature Detectors
12	Stator: None
13	Bearings: Hole provided for temperature detector
14	Terminal Boxes
15	Main: NEMA 4 Size: 14x14x42 Top Entry - 4" Conduit
16	Instrumentation: None
17	Heater: NEMA 4 Size: Threaded conn and drains 1" min.
18	Vendor should supply dimensions of two boxes on motor O/L dwg.
19	Environmental Conditions compliance with IEEE 323
20	Temperature: 104°F normal/max. = 1 accident 120°F decaying to 104°F in 24 h
21	Pressure: ATM.
22	Radiation: 1 x 10^6 Rads
23	Chemical: Not Applicable
24	Humidity: 20-100%
25	
26	Seismic Category: 1-1.5G in each of two horizontal directions, 1.0G vertical
27	Minimum Volts to Accelerate Load to Rated RPM: direction for [illegible]
28	Maximum Accoleration Time : 5 seconds based on initial
29	minimum voltage of 75% of rated at motor terminals increasing linearly to 93%
30	or rated in the first 2 seconds and increasing to 100% of rated in the next
31	2 seconds.
32	
33	
34	APAL-1125-5-E2

No.	Description	Date	By

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PROJECT Arizona Nuclear Power Plant - Containment Spray Pump
SERVICE A-C ELECTRIC MOTOR DATA

35 Temperature Rise: 80°C Method: Resistance
36 Noise Level Requirements: 90 dba @ 5 feet
37 Locked Rotor Current: Not to exceed 6 times full load current. Motors
38 shall have a safe stalled rotor time which is longer than the accelerating time.
39
40
41 Grounding Pads: Delete 4.6.1 of Ref. 3.1.4 and substitute - Two stainless steel
42 grounding pads welded to each motor with two holes drilled out and tapped for 1/2"
43 on 1-3/4" centers shall be provided.
44 Vibration Requirements: Hydraulic Institute when coupled with pump
45
46 Stators shall be submerged tested in accordance with IEEE 429 Part 4
47
48 Special Requirements: Insulation system shall be one of the following:
49 Westinghouse Electric Corp. (Thermoplastic-Epoxy)
50 General Electric Company (Poly-Seal)
51 Electric Machinery Mfg. Company (Sil-Clad)
52 Louis-Allis Company (Armor Seal)
53 The Electric Products Company (Mica-Pac)
54 Allis Chalmers Mfg. Company (Silco-Flex)
55
56 The motor leads shall not be less than 4 feet long when measured from the point
57 where they enter the terminal box. They shall be of extra flexible wire ha
58 silicone or ozone-resistant rubber insulation. If braided jackets are used
59 braid shall not becarried into the connection of the windings.
60
61 The connectors shall be API compression type terminal connectors of the pro
62 for the motor leads and shall be furnished separately.
63
64 The first motor of a given manufacturer, HP, and frame size shall receive a
65 test plus additional tests of noise, vibration, insulation resistance, speed-
66 characteristics and shaft current. Subsequent motors shall receive routine
67 however if the enclosure is different an additional noise test shall be made.
68 • Load Characteristics: Standard 9001-11.05-5-A2

No.	Description	Date	By

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PROJECT Arizona Nuclear Power Plant - Containment Spray Pump
SERVICE A. C. Electric Motor Data

1	Data By Supplier			4. PLEASE REVISE TO 5800
2	Motor Mfgr: Westinghouse Electric Corporation			HP: 700
3	Frame No.: 5808-P39	Volts: 4160	Phase: 3	Service Factor: 1
4	Nema Design: B (5809-P39)		Enclosure: WP-II	
5	Sync RPM: 1800 per FCR #50.738-N	Full Load RPM: 1770		
6	AMPS			
7	Full Load: 89.6		Locked Rotor: 565	
8	Torque			
9	Full Load: 2068		Pull Up % FL: 100	
10	Starting, % FL: 100		Breakdown, % FL: 200	
11	Efficiency			
12	Full Load: 93.4	3/4 Load: 92.9	1/2 Load: 90.3	
13	Power Factor			
14	Full Load: 90.0	3/4 Load: 89.4	1/2 Load: 85.5	
15	Insulation System(s)			
16	Nema Class: B			
17	Type: Thermalastic Epoxy Sealed System			
18	Mfgr: Westinghouse			
19	Bearing: Westinghouse Option			
20				
21	Bearings			
22	Type:		Lubrication:	
23	Thrust Type: Angular Contact Ball		Lubrication: Oil	
24	Guide Type: Ball		Lubrication: Oil	
25	Type:		Lubrication:	
26	Space Heaters Wrap Around Type			
27	Watts: 240	Volts: 120	Phase: Single	
28	Acceleration Time			
29	Minimum Volts: Less than 8 secs. (Approx. 4 sec)			
30	Rated Volts: Less than 4 secs. (Approx. 2 sec)			
31	Safe Locked Rotor Time: (Later)			
32	Temperature Rise: 80°C		Method: Resistence	
33	Motor Wk^2: 227		Motor Weight: 5500 lbs.	
34				

PROJECT Arizona Nuclear Power Plant – Containment Spray
SERVICE A-C Electric Motor Data

Permissible starts per Unit Time:

With rated voltage and freq. – within NEMA Limits at motor terminals

...and with connected load inertia not exceeding 71 lb.ft^2

Motor Cold – 2 Consecutive Starts

Motor at operating temp. – 1 Start

Other: Subsequent starts with Motor running – between starts – 15 minutes apart

Subsequent starts with motor standing – between starts – 45 minutes apart

Expected Natural Frequency – 40

Dimensions per DS 3240 Page 51

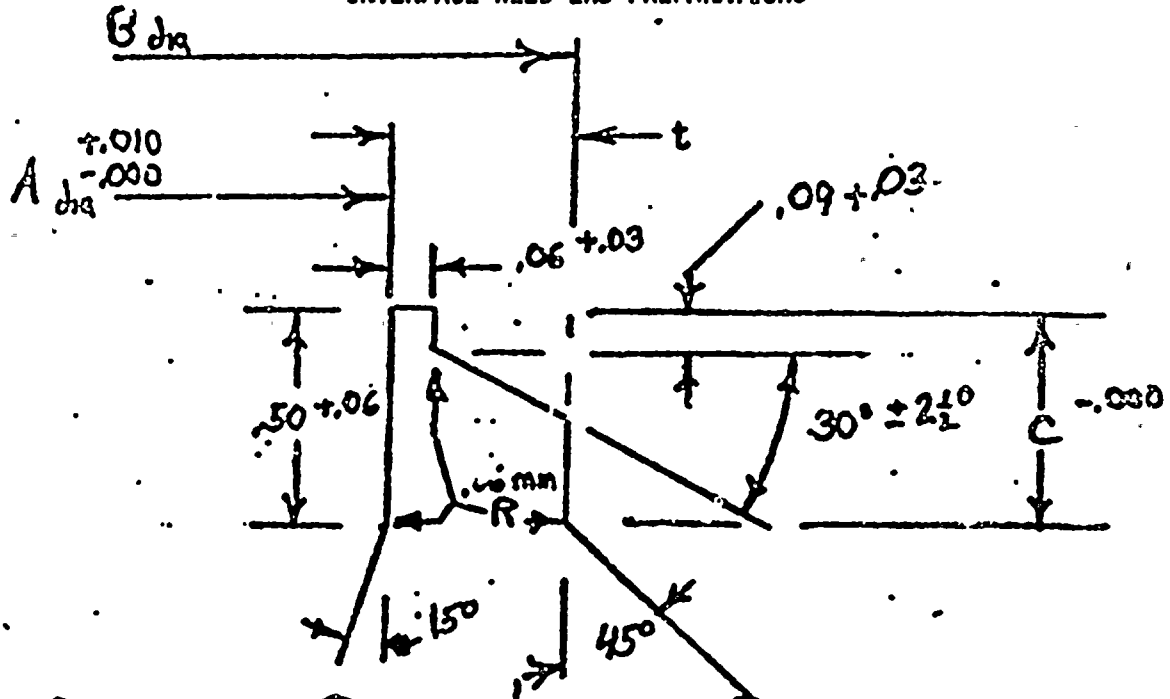
Two sets of space heaters are supplied. Space heaters will operate at 240 volts for 5 seconds maximum.

COMBUSTION ENGINEERING, INC. WINDSOR, CONN. SKETCH 14273-1

TOMER AUPS Safeguards Pumps CONT. NO. 14273 MADE BY DRV DATE 3/29/72

TION DWG. NO. CHK'D BY DATE

INTERFACE WELD END PREPARATIONS



Containment Spray & LPSI Pumps

Nozzle	Size	Sch	t	A	B	C
Discharge	8"	40S	.322	8.020	8.63	.48
Suction	14"	20	.312	13.413	14.00	.47

HPSI Pump

Discharge	4"	80S	.337	3.869	4.50	.51

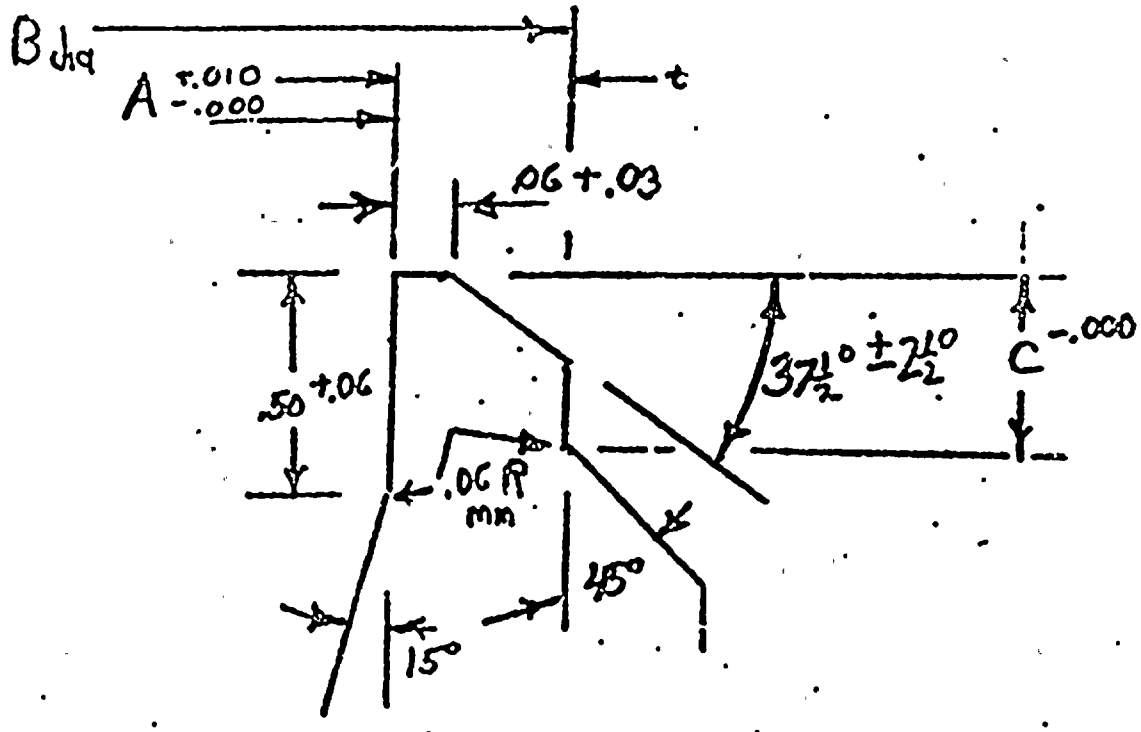
NOOI-11.05-5-f2

COMBUSTION ENGINEERING, INC. SKETCH 14273-2
WINDSOR, CONN.

OMER AMPP Safeguard Pumps CONT. No. 14273 MADE BY [illegible] DATE 3/29/72

TION DWG. No. CHK'D BY DATE

INTERFACE WELD END PREPARATIONS (CONTINUED)



HPSI Pump

Nozzle	Size	Sch	t	A	B	C
Suction	10"	20	.250	10.25	10.75	.38

N001-11.05-5-12