BOSTON EDISON COMPANY
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BOSTON, MASSACHUSETTS 02199

G. CARL ANDOGNINI
SUPERINTENDENT
NUCLEAR OPERATIONS DEPARTMENT

November 26, 1979

BECo. Ltr. #79-243

Mr. Cecil Thomas
Bulletins & Orders Task Force
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

License No. DPR-35
Docket No. 50-293

Bulletins and Orders Task Force
Long Term Systems Info.mation

Reference:

(a) NRC Letter (T.A. Ippolito) to Boston Edison Company (G.C. Andognini) dated July 13, 1979, titled "Additional Information Required for NRC Staff Generic Report on Boiling Water Reactors".

(b) Boston Edison Company letter (G.C. Andognini) to NRC (D.F. Ross) dated August 20, 1979, titled "BWR Operating Plant Owners Group General Electric Report, NEDE-24708".

Dear Mr. Thomas:

Please find enclosed, per the request of the subject task force (ref. a) the specific and comprehensive information previously deferred until November 15, 1979 (ref. b).

On the pages entitled "Primary Containment Isolation System Data", no entries have been listed in the "shutdown position" and "post accident position". Since valve pos*tions are dependent upon the type of accident and time phase of shutdown, we feel that more clarification on the specific requirements of these questions is necessary and request that you provide this clarification at your earliest convenience.

If during your review of this material you should have any questions or concerns, please do not hesitate to contact us.

Very truly yours,

cc: P.W. Marriott
General Electric Co.
175 Curtner Avenue Mail Code 864
San Jose, California 95125

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Attachment
JDK/gs

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P 7912040

ATTACHMENT A

PLANT PILGRIM UNIT(S) 1

BYPASS CAPACITY

PLANT STEAM BYPASS CAPACITY, % RATED

The turbine bypass system capacity is based on 25% of the turbine design flow.

The turbine bypass system consists of three automatically and sequentially operated regulating valves mounted on a valve manifold. The manifold is connected to the main steam lines upstream of the turbine main stop valves. Each bypass valve outlet is piped to the main condenser and a pressure reducing orifice is located at the condenser connection.

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PLANT PILGRIM I

SYSTEM AND COMPONENTS SHARED BETWEEN UNITS

PAGE__ CONTINUED PAGE NONE

SINGLE-UNIT PLANT CHECK HERE ☑ AND DO NOT COMPLETE

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<u>PLANT - SPECIFIC SYSTEM INFORMATION</u>

System	System		Water Sources			Instrumentation and Control		Frequency of System and Component Tests
	Safety Classification	Seismic Catetory	Name	Safety Classification	Seismic Category	Safety Classification	Seismic Category	
1. RCIC	Q	I	CST Suppression Pool	Non-Q Q	II I	Q	I	See A
2. HPCI	Q	I	CST Suppression Pool	Non-Q Q	II I	Q	I	B
3. Low Press. Core Spray (LPCS)	Q	I	Suppression Pool CST	Q Non-Q	I II	Q	I	C
4. LPCI (RHR)	Q	I	Suppression Pool	Q	I	Q	I	D
5. ADS	Q	I	N/A	N/A	N/A	Q	I	E
6. SRV	Q	I	N/A	N/A	N/A	N/A	N/A	F
7. RHR (including Shutdown, cooling/containment spray steam condensing suppression pool cooling.	Q	I	Suppression Pool Reactor Coolant	Q	I	Q	I	G
8. SSW	Q	I	Cape Cod Bay (intake struc.)	Q	I	Q	I	H
9. RBCCW	Q	I	Demin. Wtr. For Fill & make-up	Non-Q	II	Q	I	I
10. CRDS	Q	I	CST	Non-Q	II	Q	I	J
11. Condensate Storage Tank (CST)	Non-Q	II	Treated Wtr. Tks.	Non-Q	II	Non-Q	II	K
12. Main Feedwater	Non-Q	I	CST	Non-Q	II	Non-Q	II	L
13. Recirculation Pump/Motor Cooling	Non-Q	II	Rx Coolant RBCCW	Q	I	II	Non-Q	M

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(A) Frequency of System and Component Tests

RCIC System

a.	Simulated Automatic Actuation Test	Once/operating cycle
b.	Pump Operability	Once/month
c.	Motor Operated Valve Operability	Once/month
d.	Flow Rate at 1000 psig	Once/3 months
e.	Flow Rate at 150 psig	Once/operating cycle

(B) Frequency of System and Component Tests

HPCI System

a.	Simulated Automatic Actuation Test	Once/operating cycle
b.	Pump Operability	Once/month
c.	Motor Operated Valve Operability	Once/month
d.	Flow Rate at 1000 psig	Once/3 months
e.	Flow Rate at 150 psig	Once/operating cycle

(C) Frequency of System and Component Test

Core Spray System

a. Simulated Automatic Actuation Test	Once/operating cycle
b. Pump Operability	Once/month
c. Motor Operated Valve Operability	Once/month
d. Pump Flow Rate Each pump shall deliver at least 3600 gpm against a system head corresponding to a reactor vessel pressure of 104 psig	Once/3 months

(D) Frequency of System and Component Tests

Low Pressure Coolant Injection

a. Simulated Automatic Actuation Test	Once/Operating cycle
b. Pump Operability	Once/month
c. Motor Operated Valve operability	Once/month
d. Pump Flow Rate	Once/3 months

(E) Frequency of System and Component Tests

ADS System

1. During each operating cycle the following tests shall be performed on the ADS:

   a. A simulated automatic actuation test shall be performed prior to startup after each refueling outage.

   b. With the reactor at pressure, each relief valve shall be manually opened until a corresponding change in reactor pressure or main turbine bypass valve positions indicate that steam is flowing from the valve.

2. When it is determined that one valve of the ADS is inoperable, the ADS subsystem actuation logic for the other ADS valves and the HPCI subsystem shall be demonstrated to be operable immediately and at least weekly thereafter until the valve is repaired.

(F) Frequency of System and Component Tests

Safety Relief Valves

1. At least one safety valve and two relief/safety valves shall be checked or replaced with bench checked valves once per operating cycle. All valves will be tested every two cycles.

2. At least one of the relief/safety valves shall be disassembled and inspected each refueling outage.

(G) Frequency of System and Component Test

Standby Liquid Control System

The operability of the Standby Liquid Control System shall be verified by the performance of the following tests:

1. At least once per month each pump loop shall be functionally tested by recirculating demineralized water to the test tank.

2. At least once during each operating cycle:

   a. Check that the system relief falves trip full open at pressures less than 1800 psig, and reseat on a falling pressure greater than 1275 psig.

   b. Manually initiate the system, except explosive valves. Pump boron solution through the recirculation path and back to the Standby Liquid Control Solution Tank. Minimum pump flow rate of gpm against a system head of 1275 psig shall be verified.

   c. Manually initiate one of the Standby Liquid Control System loops and pump demineralized water into the reactor vessel.

      This test checks explosion of the charge associated with the tested loop, proper operation of the valves, and pump operability. The replacement charges to be installed will be selected from the same manufactured batch as the tested charge.

   d. Both systems, including both explosive valves, shall be tested in the course of two operating cycles.

(H) Frequency of System and Component Test

Containment Cooling Subsystem

Containment Cooling Subsystem Testing shall be as follows:

a. Pump and Valve Operability	Once/3 months
b. Pump Capacity Test Each RBCCW pump shall deliver 1700 gpm at 70 ft. TDH. Each SSWS pump shall deliver 2700 gpm at 55 ft. TDH.	After pump maintenance and every 3 months
c. Air test on drywell and torus headers and nozzles	Once/5 years

(I) Frequency of System and Component Test

Reactor Building Closed Cooling Water

Containment Cooling Subsystem Testing shall be as follows:

a. Pump and Valve Operability	Once/3 months
b. Pump Capacity Test Each RBCCW pump shall deliver 1700 gpm at 70 ft. TDH. Each SSWS pump shall deliver 2700 gpm at 55 ft. TDH.	After pump maintenance and every 3 months
c. Air test on drywell and torus headers and nozzles	Once/5 years

(J) Frequency of System and Component Tests

Control Rod Drive System

1. At 16 week intervals, 50% of the control rod drives shall be tested as in 1a. so that every 32 weeks all of the control rods shall have been tested. Whenever 50% of the control rod drives have been scram tested, an evaluation shall be made to provide reasonable assurance that proper control rod drive performance is being maintained.

a. Following each refueling outage, each operable control rod shall be subjected to scram time tests from the fully withdrawn position. If testing is not accomplished with the nuclear system pressure above 950 psig, the measured scram insertion time shall be extrapolated to reactor pressures above 950 psig using previously determined correlations. Testing of all operable control rods shall be completed prior to exceeding 40% rated thermal power.

2. Control Rod Accumulators

Once a shift, check the status of the pressure and level alarms for each accumulator.

(K) Condensate Storage System

Test of system and components are checked during plant startup and monitored during plant operation.

(L) Main Feedwater System

Test of system and components are checked during plant startup and monitored during plant operation.

(M) Recirculation Pump/Mortor Cooling System

Test of system and components are checked during plant startup and monitored during plant operation.

Frequency of Instrument Test

Instrument test for subject systems are grouped due to their interaction.

1.0 Reactor Building Isolation and Control System and Standby Gas Treatment System

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.D

2.0 Drywell Leak Detection

Instrumentation shall be calibrated and checked as indicated in Table 4.2.E.

3.0 Surveillance Information Readouts

Instrumentation shall be calibrated and checked as indicated in Table 4.2.F.

4.0 Control Rod Block Actuation

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.C.

System logic shall be functionally tested as indicated in Table 4.2.C.

5.0 Radiation Monitoring Systems - Isolation and Initiation Functions

A. Steam Air Ejector Off-Gass System

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.D.

System logic shall be functionally tested as indicated in Table 4.2.D.

6.0 Reactor Protection System

A. Applicability

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.

B. Objective

To specify the type and frequency of surveillance to be applied to the protection instrumentation.

C. Specification

1) Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1.1 and 4.1.2 respectively.

2) Daily during reactor power operation, the peak heat flux and peaking factor shall be checked.

7.0 Protective Instrumentation

A. Primary Containment Isolation Functions

Instrumentation shall be functionally tested and calibrated as indicated in Table 4.2.A

System logic shall be functionally tested as indicated in Table 4.2.A.

B. Core and Containment Cooling Systems - Initiation and Control

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.B

System logic shall be functionally tested as indicated in Table 4.2.B.

8.0 Inservice Inspection Requirements for High Energy Lines Outside Containment

Item No.	High Energy Area	Inspection Method	Frequency
1.	Main steam lines outside containment from containment to turbine stop valves	Visual	Monthly when operating
2.	HPCI steam line in torus area and in HPCI turbine area	Visual	Monthly when operating
3.	RCIC steam line in valve compartment and pump compartment	Visual	Monthly when operating
4.	RWCU line in pump, heat exchanger compartments and valve compartment	Visual	Monthly when operating
5.	Feedwater lines outside containment to the reactor feedwater pump check valves	Visual	Monthly when operating

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PLANT Pilgrim UNIT 1

PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

PAGE 1 CONTINUED ON PAGE 2

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POOR ORIGINAL

Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered safety function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec. (see note)	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-7A	20"	MAIN STEAM	NO	252	S	203-1A	BCDPG	I	GB	AO	A	Rm	3.5-5.5	ASP	O/C	O			C	Fig 1
X-7B		"				203-1B		"												Fig 1
X-7C		"				203-1C		"												Fig 1
X-7D		"				203-1D		"												Fig 1
X-7A		"				203-2A		O												Fig 1
X-7B		"				203-2B		"												Fig 1
X-7C		"				203-2C		"												Fig 1
X-7D	20"	"			S	203-2D		"	GB	AO			3.5-5.5	ASP		O				Fig 1
X-8	3"	"			W	220-1		I	GT	MO			NC	AC		C*				* SEE NOTE 9 + Fig 2
X-8	3"	"				220-2	BCDPQ	O	"	"	A	Rm	NC	DC	O/C	C*				* SEE NOTE 9 + Fig 2
X-9A	18"	FEED WATER				220-62A	Rv Flow	"	CK	—	RF	—	N/A	P	—	O				
X-9B	18"	"				220-62B	" "	"	"	—	"	—	"	"	—	O				
X-9A	18"	"				220-58A	" "	I	"	—	"	—	"	"	—	O				
X-9B	18"	"	NO			220-58B	" "	"	"	—	"	—	"	"	—	O				
X-41	1"	REACTOR WATER SAMPLE	NO	*		261-44	BCDPG	"	GT	AO	SP	Rm	10	EP	O/C	C*				* SEE NOTE 9
X-41	1"	"	NO	252		261-45	"	O	"	"	"	"	10	"	O/C	*				* SEE NOTE 9
X-36	3"	CONTROL ROD HYD.	YES	250		301-95	Rev Flow	I	CK	—	RF	—	N/A	P	—					NOTE 4
X-38	3/4"	CONTROL ROD DR.		"		SV-121	NOTE 4	O	GB	SC	SP	Rm	"	SP	—					NOTE 4
X-38	3/4"	"		"		SV-122	" "	"	"	"	"		"	"	—					NOTE 4
X-37	3/4"	"		"		FCV-120	" "	"	"	"	"		"	"	—					NOTE 4
X-37	3/4"	"		"		FCV-123	" "	"	"	"	"		"	"	—					NOTE 4
X-12	20"	RHR		271		1001-47	A,J,E	"	GT	MO	Rm		50 MIN MAX	DC	O/C					Fig 3
X-12	20"					1001-50	"	I	"		"		"	AC						Fig 3
X-211A	6"					1001-37A	GS	O	GB		A		STD							NOTE 2 + Fig 4
X-211B	6"					1001-37B			"											NOTE 2 + Fig 4
X-39A	16"					1001-26A			GT				30							NOTE 2 + Fig 5
X-39B	"					1001-26B			"											NOTE 2 + Fig 5
X-39A	"					1001-23A														NOTE 2 + Fig 5
X-39B	"		YES	271	W	1001-23B	GS	O	"	MO	A	Rm	"	AC	O/C	C			C	NOTE 2 + Fig 5

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POOR ORIGINAL

PLANT Pilgrim UNIT 1

PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

PAGE 2 CONTINUED ON PAGE 3

Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered safety function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec.	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-17	4"	RHR	YES	2-1	W	1001-63	ANF	I	GT	MO	RM	RM	30	AC	O/C	C			C	FIG 6
X-17	"	↑	↑	↑	↑	1001-60	"	C	GT	↑	"	↑	"	DC	↑	↑			↑	FIG 6
X-210A	12"					1001-36A	G	↑	GB		A		STD	AC						* THROTTLING TYPE NOTE 2
X-210B	"					1001-36B	"		"		↑		↑	↑						* " " "
X-210A	"					1001-34A	"		GT											NOTE 2 + FIG 4
X-210B	"					1001-34B	"		"											NOTE 2 + FIG 4
X-51A	18"					1001-29A	R,M,A,E	↓	"	↓	↓		↓	↓						NOTES 17 & 11 + FIG 7
X-51B	↑					1001-29B	R,M,A,E	C	"	MO	A		STD	AC						NOTES 17 & 11 + FIG 7
X-51A						1001-68A	REV FLOW	I	CK	AO	RM		N/A	P		↓				TESTABLE CHECK + FIG 7
X-51B						1001-68B	" "	I	"	"	"		N/A	P		C				VALVE NOTE 3 + FIG 7
X-222A						1001-7A	RM	O	GT	MO	A		STD	AC		O				
X-222D						1001-7B	"	↑	↑	↑			↑	↑		↑				
X-222B	↓					1001-7C	"													
X-222C	18"					1001-7D	"													
X-210A	3"					1001-18A	"		↓	↓		↓	↓	↓		*				* CLOSES WHEN RHR
X-210B	"					1001-18B	"		GT	MO	A	RM	STD	AC	O/C	*				PUMP EXCEEDS MIN. FLOW
X-210A	2"					1001-3A	REV FLOW		CK	RF	RF	—	N/A	P	—					
X-210B	"					1001-2B	" "		"	"	"	—	"	P	—					
X-210A	"					1001-2C	" "		"	"	"	—	"	P	—	↓				
X-210B	"					1001-2D			"	"	"	—	"	P	—	O				
NONE	4"	↓		↓		1001-32	FA	↓	GB	MO	A	RM	STD	AC	O/C	C				
"	"	RHR		2-1		1001-21	FA	O	"	"	"	"	"	DC	O/C	C				
X-42	1½"	STANDBY LIQ. CONT. SYS.	↓	2-1		1101-15	REV FLOW	I	CK	RF	RF	—	N/A	P	—	C				FIG. 9
"	"	" " " "	YES	"		1101-16	REV FLOW	O	"	"	"	—	"	P	—	C				FIG. 9
X-14	6"	RUBBER WAST CLEANUP SYS.	NO	2-1		1201-2	AWYSIM	I	GT	MO	RM	*	STD	AC	O/C	O				* ALARM ONLY + FIG 8
"	"	" " "	↑	"		1201-5	AW,YS,RM	O	"	"	"	"	"	DC	C/O	O				* " " + FIG 8
X-9A	"	" " "		"	↓	1201-80	"	C	GL	"	"	"	"	AC	O/C	O			↓	FIG. 10
"	6"	"	↓		W	1201-81	REV FLOW	O	CK	RF	RF	—	N/A	P	—	O			C	FIG. 10
			NO																	

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PLANT Pilgrim UNIT I

PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

PAGE 3 CONTINUED ON PAGE 4

POOR ORIGINAL

Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered safety function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec.	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-53	3"	RCIC	YES	2-5	W	1301-16	K	I	GT	MO	A	RM	STD	AC	O/C	O			C	Fig 14
X-53	"	↑	↑	↑	↑	1301-17	K	O	"	"	A	"	"	DC	O/C	O			C	Fig 14
X-225	8"					1301-41	REV FLOW	↑	CK	—	RF	—	N/A	P	—	C			C	
X-225	"					1301-64	" "		SCV	—	"	—	"	P	—	O			O	
X-210B	2"					1301-60	RM		GB	MO	RM	RM	STD	DC	O/C	C			C	
X-210B	"					1301-47	REV FLOW		CK	—	RF	—	N/A	P	—	↑			↑	
X-9A	4"					1301-50	↑		"	AO	"	—	"	P	O/C					Fig. 11
X-9A	"					1301-48			GT	MO	A	RM	STD	DC	O/C					Fig. 11
X-226	2"			↓		1301-57	↓		CK	—	RF	—	N/A	P	—	↓				
X-226	"			2-5		1301-40	REV FLOW		"	—	"	—	"	P	—	C				
NONE	1"			2-6		1301-12	X		GB	AO	A	RM	STD	SP	O/C	O				
NONE	"			2-5		1301-37	X		"	"	A	"	"	"	O/C	O				
X-220	6"	↓		"		1301-25	RM		GT	MO	RM	"	"	DC	O/C	C				
X-220	"	RCIC		"		1301-26	"		GB	"	"	"	.	"	O/C	↑				
X-210A	"	CORE SPRAY		2-2		1400-35	REV FLOW		CK	—	RF	—	N/A	P	—					
X-210B	"	↑		↑		1400-36	" "		"	—	"	—	"	P	—					
X-16A	10"					1400-24A	RM		GT	MO	RM	RM	STD	AC	C/O	↓			↓	}
X-16A	↑					1400-25A	"		GB	"	↑	↑	"	↑	C/O	C			C	NOTE 11
X-16B						1400-24B	"	↓	GT	"			"		C/O	O			O	}
X-16B						1400-25B	"	O	GB	"			"		C/O	O			O	
X-16A	↓					1400-9A	REV FLOW	I	CK	AO			N/A	↓	O/C	C			C	} TESTABLE CHECK
X-16B	10"					1400-9B		"	"	"	RM	RM	"	AC	O/C	C			C	} VALVE NOTE 3
X-210A	3"					1400-13A	"	O	SCV	—	*	*	"	H	—	O			O	LOCKED OPEN
X-210B	"					1400-13B	" "	↑	"	—	*	*	"	H	—	O			O	" "
X-210A	6"					1400-4A	G		GB	MO	RM	RM	STD	AC	O/C	C*			C	* NOTE 9
X-210B	"					1400-4B	"		"	"	↑	↑	↑	↑	O/C	C*			C	* NOTE 9
X-229A	18"	↓	↓	↓	↓	1400-3A	RM		GT	"					C/O	O			O	
X-229B	"	CORE SPRAY	YES	2-2	W	1400-3B	"	O	"	"	RM	RM	STD	AC	C/O	O			O	

PLANT Pilgrim UNIT I

PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

PAGE 1 CONTINUED ON PAGE 5

Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered Safety Function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec.	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-19	2"	RAD WASTE COL. SYS.	NO	232	W	7011-A	BF	O	PG	AO	A	Rm	STD	SP	O/C	O			C	
X-19	"	" " "	"	↑	W	7011-B	"	O	"		↑	↑	"	"	O/C	↑			C	
X-18	"	" " "	"	↓	W	7017-A	"	O	"				"	"	O/C				C	
X-18	"	" " "	"	232	W	7017-B	"	O	"	AO			"	"	O/C				C	
X-52	10"	HPCI	YES	243	S	2301-4	Rm, L	I	GT	MO			*	AC	C/O				O	* 27 IN/MIN. FIG D
X-52	"	↑	↑	"	S	2301-5	"	O		"			*	DC	C/O				O	* 27 IN./MIN. FIG D
—	1"			"	W	2301-29	X	↑	GB	AO	↓	↓	STD	SP	O/C				C	
—	1"			244	↑	2301-64	X		"	"	A	Rm	"	"	O/C				C	
X-223	20"			243		2301-45	REV FLOW		CK	—	RF	—	N/A	P	—	↓			C	
X-223	"			↑		2301-74	" "		SCV	—	"	—	↑	P	—	O			O	* LOCKED OPEN
X-221	16"					2301-36	RmL		GB	MO	Rm	A		DC	O/C	C			C	VALVES OPEN ON LOW COND. TANK LEVEL OR
X-221	"				↓	2301-35	"		"	"	"	A		"	O/C	C			C	HIGH SUPPRESSION POOL LEVEL
X-9B	1"				W	2301-7	REV FLOW		CK	AO	RF	—		P	O/C	C			C	FIG. 13
X-227	2"				S	2301-34	" "		"	P	"	↑		P	O/C	C			C	
X-227	"				S	2301-71	" "		SCV	P	"			P	—	O			O	* LOCKED OPEN
X-210B	4"	↓		↓	W	2301-40	" "		CK	P	"		↓	P	—	C			C	
X-210B	"	HPCI		243	W	2301-14	Rm		GB	MO	Rm		N/A	DC	O/C	↑			↑	
X-5?A	1"	INSTRUMENT		252	S	261-11A	—		↑	—	—		—	H	N/A					
X-5?B	↑	↑		↑	↑	261-12A	↑			↑	↑		↑	↑	↑					
X-5?C						261-11B														
X-5?D						261-12B														
X-3?C						261-11C														
X-3?D						261-12C														
X-3?E						261-11D			↓	↓				↓						
X-3?F						261-12D			GB	—				H						
X-5?A						261-12A			EC	EF				P						
X-5?B						261-18A			↑	↑				↑						
X-5?C	↓	↓	↓	↓	↓	261-17B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓			↓	
X-5?D	1"	INSTRUMENT	YES	252	S	261-12B	—	O	FC	EF	↓	↓	↓	P	N/A	C			C	

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PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

PAGE 5 CONTINUED ON PAGE 6

Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered safety function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec.	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-34C	1"	INSTRUMENT	YES	252	S	261-17C	—	O	FC	EF	—	—	N/A	P	—	C			C	
X-34D	↑	↑	↑	"	↑	261-18C	↑	↑	"	"	↑	↑	↑	P	↑	C			C	
X-34E				"		261-17D			"	"				P		C			C	
X-34F				"		261-18D			"	"				P		C			C	
X-29A				253		2-12B			GB	H				H		O			O	
X-29A				↑		2-13B			FC	EF				P		↑			↑	
X-29B						2-16B			GB	H				H						
X-29B						2-17B			FC	EF				P						
X-29C						2-18B			GB	H				H						
↑						2-41B			"	H				H						
						2-34B			"	H				P						
						2-19B			FC	EF				P						
↓						2-46B			"	"				P						
X-29C						2-31B			"	"				P						
X-28A					↓	2-12A			GB	H				H						
"					S	2-13A			FC	EF				P						
X-28B					W	2-15A			"	"				P						
↑					↑	2-14A			GB	H				H						
						2-36			"	H				H						
						2-37			FC	EF				P						
↓						2-16A			GB	H				H						
X-28B						2-17A			FC	EF				P						
X-28C						2-18A			GB	H				H						
↑						2-34A			"	H				H						
						2-19A			FC	EF				P						
						2-35A			"	EF				P						
↓						2-41A			GB	H				H						
X-28C						2-42A			FC	EF				P						
X-28F	↓	↓	↓	↓	↓	—			"	"			↓	P		↓			↓	
"	1"	INSTRUMENT	YES	252	W	—	↓	↓	"	"	↓	↓	"	"	↓	O			O	

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PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

PAGE 6 CONTINUED ON PAGE 7

Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered safety function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec.	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-22	3"	Compressed Air System	YES	220	A	3"-267	Rev Flow	O	CK	—	RF	—	N/A	P	—	O			O	
X-21	2"	" " "	↑	220	A	2"-27b	" "	↑	CK	—	RF	—	N/A	P	—	C			C	
X-24	6"	RBCCW		215	W	40002-24	RM		GT	MO	RM	RM	STD	AC	O/C	O			O	
X-23	6"	"		215	W	6"-238	Rev Flow		CK	—	RF	—	N/A	P	~	O			O	
X-227	20"	Cont. Atmos. Cont. Sys.		227	A	5042A	AF		B	AO	A	RM	STD	A.A/N2	O/C	C			C	Fig. 15
X-227	20"	" " " "		227	↑	5042B	AF		B	AO	A	RM	STD	"	↑	↑			↑	Fig. 15
X-227	20"	" " " "		227		5040A	RM		B	AO	RM	—	STD	"						Fig. 15
X-227	20"	" " " "		227		5040B	RM		B	AO	RM	—	STD	"						Fig. 15
X-227	20"	" " " "		227		X212A	Rev Flow		VB	RF	RF	—	N/A	P						
X-227	20"	" " " "		227		X212B	" "		VB	RF	RF	—	N/A	P						
X-26	20"	" " " "		"		5035A	AF		B	AO	A	HS	STD	SP						Fig. 31
X-26	20"	" " " "		"		5035B	AF		B	AO	A	HS	"	"						Fig. 31
X-25	20"	" " " "		"		5044A	AF		B	AO	A	HS	"	"	↓					Fig. 30
X-25	20"	" " " "		"		5044B	AF		B	AO	A	HS	"	"	O/C					Fig. 30
X-25	2"	" " " "		"		5043A	AF		GB	AO	A	HS	"	"	O/C					Fig. 30
X-25	2"	" " " "		"		5043B	AF		GB	AO	A	HS	STD	"	O/C					Fig. 30
X-26	1"	" " " "		"		1"-223	Rev Flow		CK	—	RF	—	N/A	P	—					
X-26	1"	" " " "		"		5033A	AF		GT	AO	A	HS	STD	SP	O/C					Fig. 11
X-26	2"	" " " "		"		5041A	↑		GB	↑	↑	↑	↑	↑	↑					Fig. 15
X-26	2"	" " " "		"		5041B			GB											Fig. 15
X-205	20"	" " " "		"		5036A			B											Fig. 17
X-205	20"	" " " "		"		5036B			B											Fig. 17
X-205	2"	" " " "		"		5033B			GB											Fig. 17
X-205	1"	" " " "		"		5033C			↑											Fig. 18
X-26D	1"	" " " "		"		5059														
X-26F	1"	" " " "		"		5065-24														Fig. 20
X-26F	1"	" " " "		"		5065-26	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓			↓	Fig. 20
X-228K	1"	" " " "	↓	"	A	5065-25	AF	O	GB	AO	A	HS	STD	SP	O/C	C			C	Fig. 19
X-23	6"	RBCCW	YES	215	W	6"-24	—	I	GT	H	H	—	STD	H.	—	O			O	

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PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

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Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered safety function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec.	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-228K	1"	CONT. ATMOS. CONT. SYS.	YES	227	A	5065-27	AF	O	GB	AO	A	HS	STD	SP	O/C	C			C	Fig. 19
X-227	↑	↑	↑	↑	↑	5065-23	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑ *			↑	NOTE 15 + Fig. 15
X-227						5065-16										*				NOTE 15 + Fig. 15
X-228C						5065-22														Fig. 21
X-228C						5065-15														Fig. 21
X-106AB						5065-21														Fig. 23
X-106AB						5065-14														Fig. 23
X-50AD						5065-20														Fig. 24
X-50AD						5065-13														Fig. 24
X-29D						5065-19														Fig. 25
X-29D						5065-12														Fig. 25
X-228J						5065-18														Fig. 22
X-228J						5065-11														Fig. 22
X-25						5065-17	↓	↓	↓		↓	↓		↓		*				* NOTE 15 + Fig. 30
X-25						5065-10	AF	O	G-B		A	HS		SP		*				* NOTE 15 + Fig. 30
X-203A-K		↓		↓	↓	5045A-K	Rev Flow	I	CK	↓	RF	—		P		↓			↓	10 PLACES
X-228E		CONT. ATMOS. CONT. SYS.		227	A	5046	AF	O	G-B	AO	A	PS	STD	SP		C			C	
X-35		NEUTRON MONITORING		—	—	736A	RM	↑	EV	EV	HS	—	N/A	DC		O			O	
X-35		↑		↑	↑	736B	"		"	"	"	↑	↑	"		O			O	
X-35						736C	"		"	"	"			"		O			O	
X-35						736D	"		"	"	"			"		O			O	
X-35						733A	AF		BL	—	A			AC		C*			C	NOTE 16
X-35						733B	↑		↑	—	"			"		C*			C	
X-35	↓	↓	↓	↓	↓	733C	↓	↓	↓	—	"		↓	"	↓	C*			C	
X-35	1"	NEUTRON MONITORING	YES	—	—	733D	AF	O	BL	—	"	↓	N/A	"	O/C	C*			C	
X-15E	1"	CONT. ATMOS	NO	239	A	5065-35	AF	O	GB	AO	A	HS	STD	DC	O/C	O			C	Fig. 26
X-15E	1"	↑	↑	↑	↑	5065-31	↑	↑	↑	↑	↑	↑	↑	AC	↑	↑			C	Fig. 26
X-15F	1"					5065-36								DC					C	Fig. 27
X-15F	1"	↓	NO	239	A	5065-32	AF	O	GB	AO	A	HS	STD	AC	O/C	O			C	Fig. 27

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PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

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Isolation Valves

Prim. Cont. Penetration Number	Line Size, In.	System	Is System an Engineered safety function	Figure	Process Fluid	Valve Number	Isolation Signal Code(s)	Location	Type	Actuator	Primary Actuation Mode	Secondary Actuation Mode	Full Closure Time, sec.	Power Source	Position Indication in Control Rm.	Positions: Normal	Positions: Shutdown	Positions: Post Accident	Positions: Power Failure	Comments
X-29E	1"	CONT. ATMOS.	NO	239	A	5065-31	AF	O	GB	AO	A	HS	STD	DC	O/C	O			C	FIG 29
X29E	1"	↕	↕	↕	A	5065-33	AF	↕	↕	↕	↕	↕	''	AC	↕	O			C	FIG 29
X29F	1"	↕	↕	↕	A	5065-38	AF	↕	↕	↕	↕	↕	''	DC	↕	O			C	FIG 28
x29F	1"	↕	↕	↕	A	5065-34	AF	↕	↕	↕	↕	↕	''	AC	↕	O			C	FIG 28

ISOLATION SIGNAL CODES FOR TABLE

Signal	Description
A*	Reactor vessel low water level - scram and close isolation valves except main steam lines.
B*	Reactor vessel low low water level - initiate RCIC, HPCI and close main steam line isolation valves.
C*	High radiation - main steam line (also causes scram).
D*	Line break - main steam line (steam line high space temperature or high steam flow).
32 E	Reactor low low level or high drywell pressure - select LPCI and close other loop valves.
F*	High drywell pressure - close RHR/shutdown cooling and head spray plus the RHR to radwaste valves.
G	Reactor vessel low water level and low pressure; or high drywell pressure - initiate Core Spray and RHR systems.
30 J*	Line break in cleanup system - high space temperature, or high flow.
32 K*	Line break in RCIC system steam line to turbine (high steam line space temperature or high steam flow) or low steam pressure.
L*	Line break in HPCI system steam line to turbine (high steam line space temperature or high steam flow) or low steam line pressure.
M*	Line break in RHR shutdown and head cooling (high space temperature; alarm only; no auto closure).
P*	Low main steam line pressure at inlet to main turbine (RUN mode only).
S	Low drywell pressure - close containment spray valves.
T	Low reactor pressure permissive to open core spray and RHR-LPCI valves.
U	High reactor vessel pressure - close RHR shutdown cooling valves and head cooling valves.
W	High temperature at outlet of cleanup system nonregenerative heat exchanger.

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Y Standby liquid control system actuated.

RM* Remote manual switch from control room.

32 Q Reactor high water level - isolate main steam line (except in run mode).

X* RCIC or HPCI steam supply valve (as applicable) not fully closed.

* These are the isolation functions of the primary containment and reactor vessel isolation control system; other functions are given for information only.

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PLANT ____________ UNIT ____

PRIMARY CONTAINMENT ISOLATION SYSTEM DATA

PAGE ____ CONTINUED ON PAGE FINAL

ABBREVIATIONS

Engineered Safety Function

N = NO
Y = YES

Position Indication in Control Room

D = Direct
I = Indirect
N = None
Others stated in Table

Fluid

A = Air
S = Steam
W = Water
Others stated in Table

Isolation Valve Location

I = Inside Containment
O = Outside Containment
Others stated in Table

Isolation Valve Actuation Mode

A = Automatic
EF = EXCESS FLOW
OP = Overpressure
RF = Reverse Flow
RM = Remote Manual
Others stated in Table
NC = NORMALLY CLOSED

Isolation Valve Positions

AI = As Is
C = Closed
O = Open
Others stated in Table

Isolation Valve Type

B = Butterfly
BCK = Ball check
BL = Ball
CK = Check
DCV = Diaphragm Control Valve
GB = Globe
GT = Gate
RV = Relief
SCV = Stop Check
SV = Solenoid
VB = Vacuum Breaker
XV = Explosive
Others stated in Table
PG = PLUG
FL = FLOW CHECK

Isolation Valve Power Source

A = Air
AC = AC
DC = DC
H = Hand
P = Process fluid
Others stated in Table
SP = SPRING

Isolation Valve Actuator

AO = Air
MO = Motor
SO = Solenoid
Others stated in Table

Isolation Signal Codes (utility supply)

Code or Group	Parameter(s) Sensed for Isolation	Set Point (units)

NOTES FOR TABLE

These notes ar· keyed by number to correspond to numbers, in parentheses, in Table

1. Main steam isolation valves require that both solenoid pilots be deenergized to close valves. Accumulator air pressure plus spring act together to close valves when both pilots are deenergized. Voltage failure at only one pilot does not cause valve closure. The valves are designed to fully close in less than 10 seconds, but in no less than 3 seconds.

2. Containment spray and suppression cooling valves have interlocks that allow them to be manually reopened after automatic closure. This setup permits containment spray, for high drywell pressure conditions, and/or suppression pool cooling. When automatic signals are not present these valves may be opened for test or operating convenience.

3. Testable check valves are designed for remote opening with zero differential pressure across the valve seat. The valves will close on reverse flow even though the test switches may be positioned for open. The valves open when pump pressure exceeds reactor pressure even though the test switch may be for close.

4. Control rod hydraulic lines can be isolated by the solenoid valves outside the primary containment. Lines that extend outside the primary containment are small and terminate in a system that is designed to prevent out-leakage. Solenoid valves normally are closed, but they open on rod movement and during reactor scram.

5. A-c motor operated valves are powered from the a-c standby power busses. D-c isolation valves are powered from the station batteries.

6. All motor operated isolation valves remain in the last position upon failure of valve power. All air operated valves close on motive air failure or power failure at the solenoid pilots.

7. "Standard" closure rates for automatic isolation valves refer to usual industry practice and are adequate to meet isolation requirements.

8. Not used.

9. Valves identified by an asterisk in the "Normal Status" column can be opened or closed by remote manual switch for operating convenience during any mode of reactor operation except when automatic signal is present.

10. Not used.

11. Coincident signals "G" and "T" open core spray and selected LPCI valves. Special interlocks permit testing these valves by manual switch except when automatic signals are present.

12. Normal status position of valve (open or closed) is the position during normal power operation of the reactor (see "Normal Status" column).

13. Not used

14. Not used

15. Manual swi[illegible] override all automatic signals on the smaller valves that bypass the suppression chamber and drywell exhaust valves.

16. Signal "A" or "F" causes automatic withdrawal of TIP probe. When probe is withdrawn, the valve automat[illegible]y closes by mechanical action.

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Table (Continued)

NOTES FOR TABLE

17. Isolation signal "A" is permitted to close LPCI valves but only when the RHR shutdown cooling supply valves are not fully closed or reactor pressure (signal U) is below 75 psig. Valve position indicating lights are not required at the isolation valve display panel. 32

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PLANT PILGRIM UNIT I

DESIGN REQUIREMENTS FOR CONTAINMENT ISOLATION BARRIERS

Question: Discuss the extent to which the quality standards and seismic design classification of the containment isolation provisions follow the recommendations of Regulatory Guides 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Water-Containing Components of Nuclear Power Plants", and 1.29, "Seismic Design Classification".

Response: The station structures and equipment have been classified with respect to systems which must remain functional during and following the most severe natural phenomena which can be postulated to occur at this site. For the purpose of categorizing the mechanical-structural strength designs for loading conditions due to environmental events, the following definitions have been established:

1. Class I

   This class includes those structures, equipment, and components whose failure or malfunction might cause or increase the severity of an accident which would endanger the public health and safety. This category includes those structures, equipment, and components required for safe shutdown and isolation of the reactor.

2. Class II

   This class includes those structures, equipment, and components which are important to reactor operation, but are not essential for preventing an accident which would endanger the public health and safety, and are not essential for the mitigation of the consequences of these accidents. A Class II designated item shall not degrade the integrity of any item designated Class I.

The only exception of these two definitions is that a system whose failure or malfunction might increase the severity of an accident is not designed to withstand the effects of a tornado if the failure of the system will not cause an accident. The reason for making this exception is that the probability of the occurrence of a design basis loss-of-coolant accident or a design basis tornado during the life of a plant is small, therefore, the probability of the simultaneous occurrence of these two independent events is vanishingly small.

PLANT Pilgrim UNIT(S) I

NORMAL OPERATING MODES AND ISOLATION MODES

The secondary containment system is designed to withstand the maximum postulated seismic event and be capable of providing hold-up, treatment and an elevated release point for any fission products released to it. In addition, the reactor building is designed to provide protection for the engineered safeguards and nuclear safety systems located in the building from all postulated environmental events including tornadoes.

Containment Isolation Valves

The basic function of all primary containment isolation valves is to provide necessary isolation to the containment in the event of accidents or similar critical conditions when the free release of containment atmosphere cannot be permitted. The primary containment isolation valves are grouped into four basic classes. Variations to the basic isolation valve definitions are used in certain circumstances. These valves are generally located in instrument lines or in core standby cooling system lines which may be required to be operational when primary containment is required.

Class A valves are on process lines that communicate directly with the reactor vessel and penetrate the primary containment. These lines require two valves in series, one inside the primary containment and one outside the primary containment. They are located as close to the primary containment boundary as practical. Except in the case of check valves, both valves shall close automatically on isolation signal. Both valves shall receive the isolation (closure) signal even if normally closed during reactor operation. Since check valves close on reverse process flow, they are used to isolate some incoming lines. Testable check valves are used on selected process inflow lines where flow is expected to be zero or on lines which have low flow with intermittent use during normal station operation. All Class A valves except check valves are capable of remote manual control from the control room.

Class B valves are on process lines that do not directly communicate with the reactor vessel, but penetrate the primary containment free space. These lines require two valves, in series, both of them located outside the primary containment and as close to the primary containment boundary as practical. Except in the case of check valves, both valves close automatically on isolation signal. Both valves receive the isolation closure signal even if normally closed during reactor operation. All Class B valves except check valves are capable of remote manual control from the control room.

Class C valves are on process lines that penetrate the primary containment but do not communicate directly with the reactor vessel, with the primary containment free space, or with the environs. Class C lines require only one valve which closes automatically by process action (i.e., reverse flow) or by remote manual operation from the control room.

PLANT Pilgrim UNIT(S) I

NORMAL OPERATING MODES AND ISOLATION MODES

Motive power for the valves on process lines which require two valves shall be physically independent sources to provide a high probability that no single accidental event could interrupt motive power to both closure devices.

Automatic isolation valves, in the usual sense, are not used on the inlet lines of the reactor core and containment cooling systems, and reactor feedwater systems, since operation of these systems is essential following a design basis loss-of-coolant accident. Since normal flow of water in these systems is inward to the reactor vessel or to the primary containment, check valves located in these lines will provide automatic isolation, if necessary.

No automatic isolation valves are provided on the control rod drive system hydraulic lines. These lines are isolated by the normally closed hydraulic system control valves located in the reactor building, and by check valves comprising a part of the drive mechanisms.

TIP lines and small diameter instrument lines are not provided with automatic isolation valves.

TIP system guide tubes are provided with an isolation valve which closes automatically upon receipt of proper signal and after the TIP cable and fission chamber have been retracted. In series with this isolation valve, an additional or backup isolation shear valve is included. Both valves are located outside the drywell. The function of the shear valve is to assure integrity of the containment in the unlikely event that the other isolation valve should fail to close or the chamber drive cable should fail to retract if it should be extended in the guide tube during the time that containment isolation is required. This valve is designed to shear the cable and seal the guide tube upon an actuation signal. Valve position (full open or full closed) of the automatic closing valves will be indicated in the control room. Each shear valve will be operated independently. The valve is an explosive type valve and each actuating circuit is monitored. In the event of a containment isolation signal, the TIP system recieves a command to retract the traveling probes. Upon full retraction, the isolation valves are then closed automatically. If a traveling probe were jammed in the tube run such that it could not be retracted, instruments would supply this information to the operator, who would in turn investigate to determine if the shear valve should be operated.

Effluent lines such as main steam lines which connect to the reactor vessel or which are open to the primary containment have air-powered valves. This arrangement provides a high reliability with respect to functional performance. These valves are closed automatically.

The Primary Containment System (Drywell, Suppression Pool, Isolation Valves, and Containment Penetrations are Class I. Additionally the Secondary Containment System (Rx Bldg., Standby Gas Treatment, Main Stack and Reactor Bldg. Isolation Control System) is Class I. All isolation associated with the NSSS are Class I.

The Seismic I Q-List includes electrical equipment and instrumentation required for a Class I system's operation to meet the Class I criteria. Cables, cable pulls, and associated raceways required for safeguard and isolation systems are Class I.

The Boston Edison Quality Assurance Program for Operation of Nuclear Power Plants is based on the understanding that each item in the plant can be determined to belong in one (1) of three (3) categories to which different quality requirements apply. These quality categories are identified in Exhibit I.

Systems, structures, and components designated as safety related are identified on a Q-List. Provisions have been established for maintaining and controlling the Q-List. The determination of safety related items was accomplished by use of the following definitions and PNPS FSAR Appendix G and FSAR Section 14.

1. Safety Related Function

   Any function that is necessary to assure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposures comparable to the guideline exposures of 10 CFR Part 100.

2. Safety Related Systems, Structures and Components

   Those systems, structures, and components that have safety related functions.

Additional information applicable to this question may be found elsewhere in this response.

Quality Category	Description
(Q)	Safety related systems, structures, and components and those other systems, structures, and components requiring BECo selected QA program element application to meet 10 CFR 50, Appendix B, requirements. Included in this category are Code items, regardless of Code class, fabricated or installed under Section III or maintained under Section XI of the ASME Code.
(R)	Systems, structures, and components deemed essential for reliable electric power generation to which BECo selected QA program elements have been applied, although not necessary to meet 10 CFR 50, Appendix B, requirements. Included in this category are Code items maintained under Section VIII of the ASME Code.
(C)	Systems, structures, and components not deemed essential for reliable electric power generation to which standard commercial requirements are applied.

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EXHIBIT I

PLANT Pilgrim UNIT(S) I

PROVISIONS FOR TESTING

Question: Discuss the design provisions for testing the operability of the isolation valves.

Response: All essential parts of the Primary Containment and Reactor vessel Isolation Control System are testable during the reactor operation. Isolation valves can be tested to assure that they are capable of closing by operating manual switches in the control room and observing the position lights and any associated process effects. Testable check valves are arranged to verify that the valve disk is free to open and close. The channel and trip system responses can be functionally tested by applying test signals to each channel and observing the trip system response.

The Main Steam Isolation Valves are tested (test buttons provided) twice/week as required by Tech Spec. 4.7.F.D.I.C. Each valve is exercised from the control room to the "Closed to 90%" position. Once per quarter, with Reactor power < 50%, each MSIV is individually tripped and closure time is verified.

Testable check valves are to be tested (although there is no Technical Specification requirement) only during an outage (once per cycle) when access to the drywell is permitted. RHR, core spray, and HPCI testable checks have test buttons and position indicators on panel 903. RCIC System testable check valves have similar capabilities on panel 904. Acceptance criteria is that each valve cycle on demand and no unexplained descrepancies are found. Testable check valve bypass valves are tested to open on initiation of the test to equalize pressure across the check valve.

Other primary containment isolation valves are required to be tested once/3 months. Remote manual switches are provided in the control room. Each valve is cycled and time to change state is checked against maximum allowable closing time.

Feedwater check valves, control rod hydraulic return check valves, standby liquid control system check valves are assumed operable unless known to be failed.

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LDR/fej

PLANT PILGRIM UNIT I

CODES, STANDARDS, AND GUIDES

Question: Identify the codes, standards, and guides applied in the design at the containment isolation system and system components.

Response: The initiation logic for the automatic closure at the primary containment isolation valves meet the intent of the requirements of IEEE - 279.

All other applicable codes, standards, and guides are found in PNPS I, FSAR, Amendment 30, Appendices A and H.

The pressure suppression containment system's material, design, fabrication, inspection and testing are in accordance with ASME Boiler and Pressure Vessel Code, Section III, subsections B (1967 edition) with all applicable addenda published to June, 1967 and Code Case 1177-5 and 1330-1.

1470 161

PLANT Pilgrim UNIT(S) I

NORMAL OPERATING MODES AND ISOLATION MODES

Question: Discuss the normal operating modes and containment isolation provision and procedures for lines that transfer potentially radioactive fluids out of the containment.

Response: General

The containment systems of Pilgrim Nuclear Power Station utilize a "multibarrier" concept which consists of two systems. The primary containment system is a pressure suppression system which forms the first barrier. The secondary containment system is a system which minimizes the ground level release of airborne radioactive materials and forms the second barrier. The fuel, fuel cladding, and reactor primary system form additional barriers to the release of fission products.

Primary Containment Systems

The primary containment system houses the reactor vessel, the reactor coolant recirculation system and other branch connections of the reactor coolant system. The primary containment is a pressure suppression system consisting of a drywell, pressure suppression chamber which stores a large volume of water, a connecting vent system between the drywell and water pool, isolation valves, vacuum relief system, containment cooling systems, and other service equipment.

The primary containment system is designed to withstand the forces from any size breach of the nuclear system primary barrier up to and including an instantaneous circumferential break of the reactor recirculation piping and provides a hold-up time for decay of any radioactive material released. The primary containment system also stores sufficient water to condense the steam released as a result of a breach in the nuclear system primary barrier and to supply the core standby cooling systems.

Secondary Containment System

The secondary containment system encloses the primary containment system, the refueling and reactor servicing areas, new and spent fuel storage facilities and other reactor auxiliary systems. The secondary containment system serves as the only containment during reactor refueling and maintenance operations, when the primary containment is open, and as an additional barrier when the primary containment system is functional. The secondary containment system consists of the reactor building, standby gas treatment system, main stack, reactor building isolation and control system, and other service equipment.

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PLANT Pilgrim UNIT(S) I

NORMAL OPERATING MODES AND ISOLATION MODES

Lines, such as those of the reactor building closed cooling water system which do not connect to the reactor primary system or open into the primary containment, are provided with at least one a-c powered valve on the effluent line and a check valve on the influent line.

Instrumentation piping connecting to the reactor primary system which leaves the primary containment is dead-ended at instruments located in the reactor building. These lines are provided with flow limiting orifices, manual isolation valves and excess flow check valves.

The control rod hydraulic system is provided with three valves which can be utilized for isolation purposes. The first is a ball check valve which comprises an internal portion of the control drive mechanism. The other valves are normally closed hydraulic system control valves located in the reactor building.

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ATTACHMENT B (FIGURES 1-31)

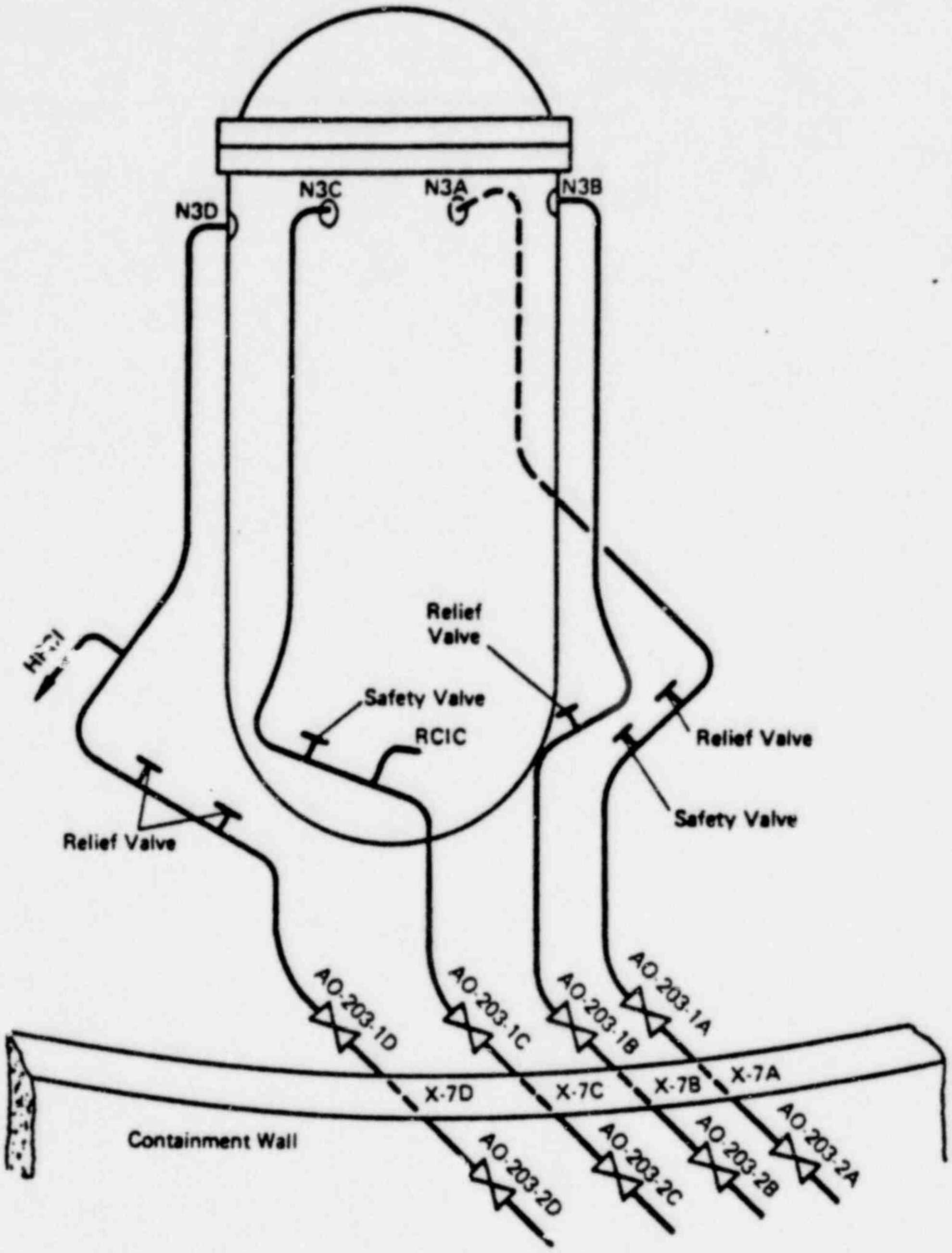


FIG. 1

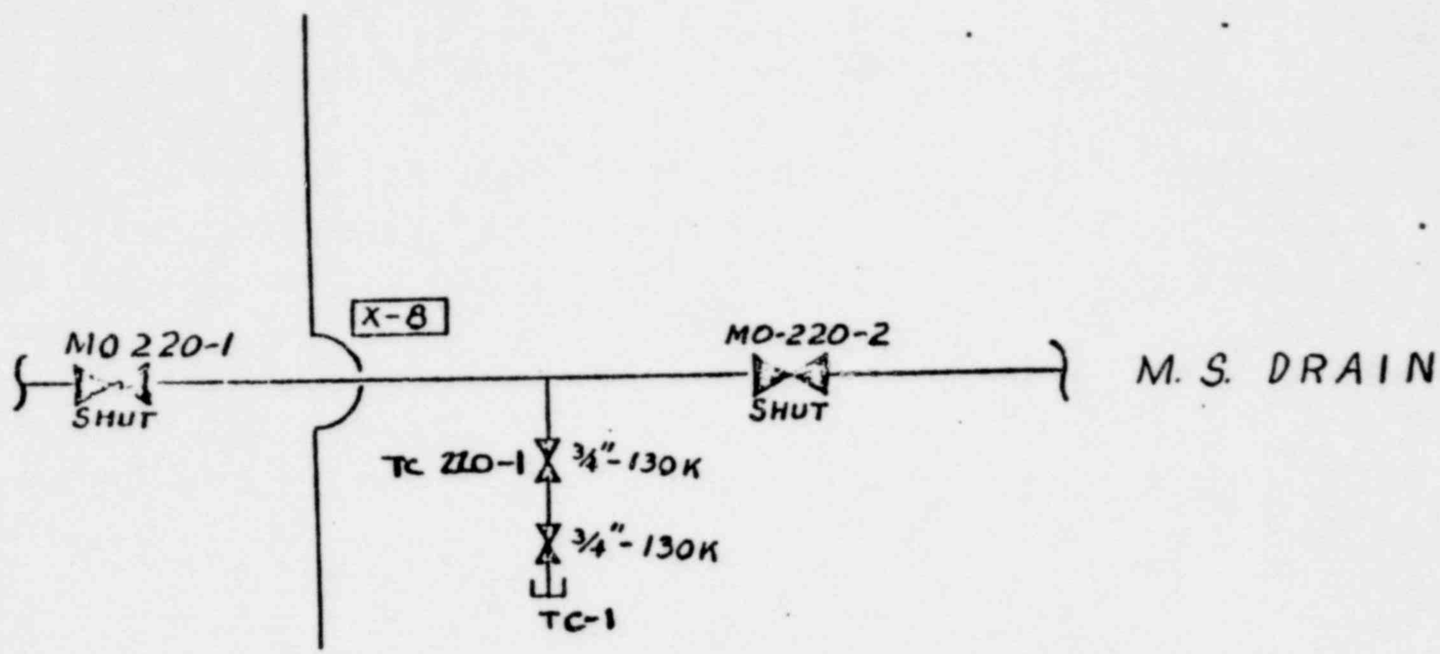
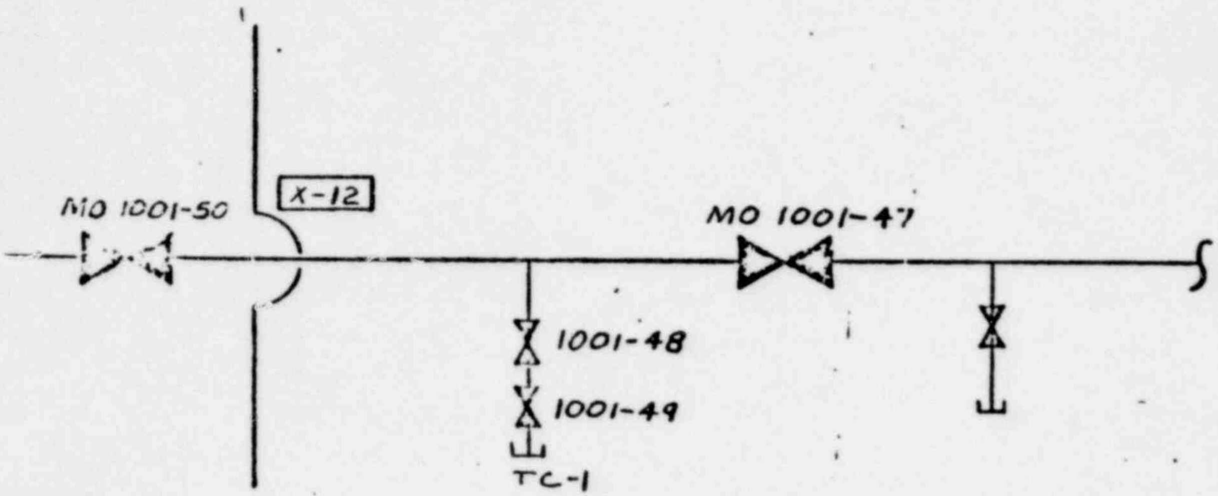

X-8
MO 220-1
SHUT
MO-220-2
SHUT
M. S. DRAIN
TC 220-1
3/4"-130K
3/4"-130K
TC-1

FIG. 2



RHR SUCTION FROM RECIRC.

FIG. 3

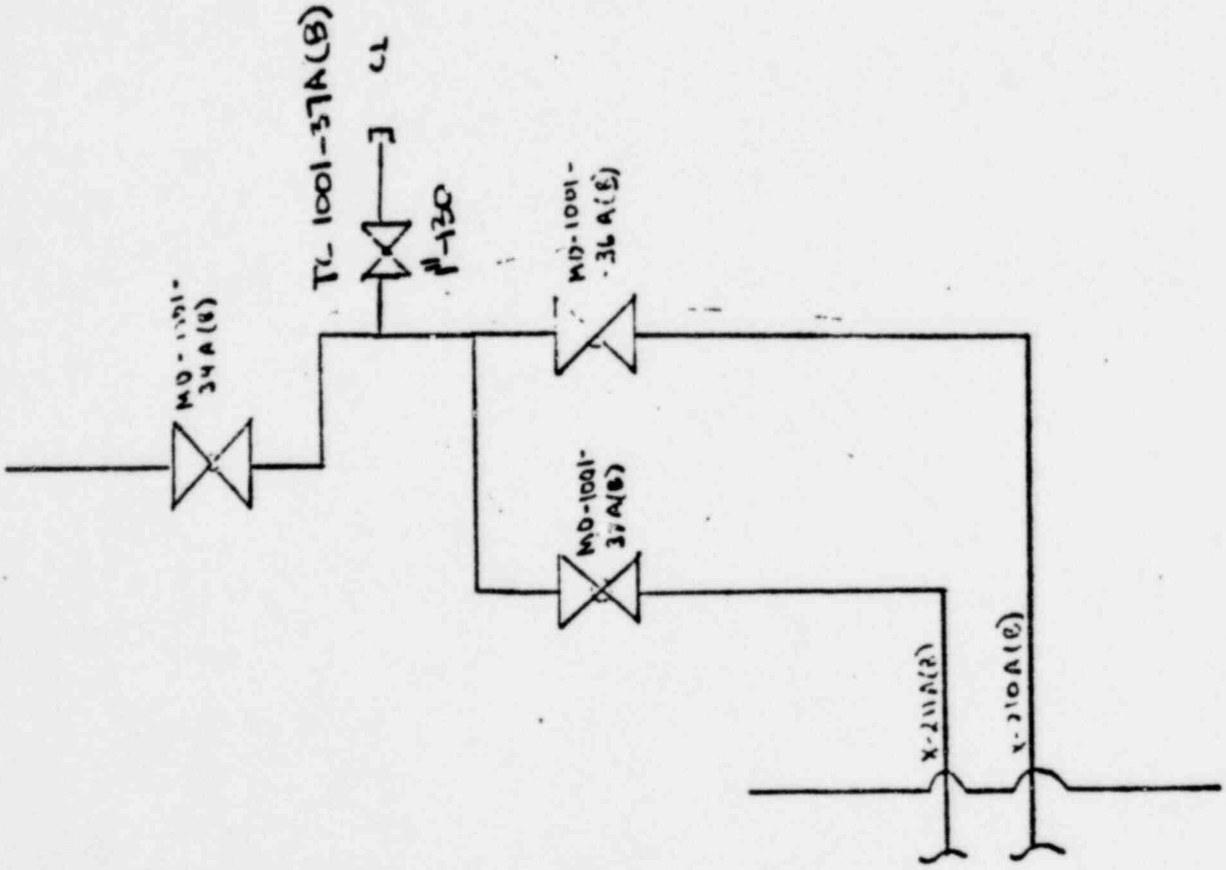


FIG. 4

1470 167

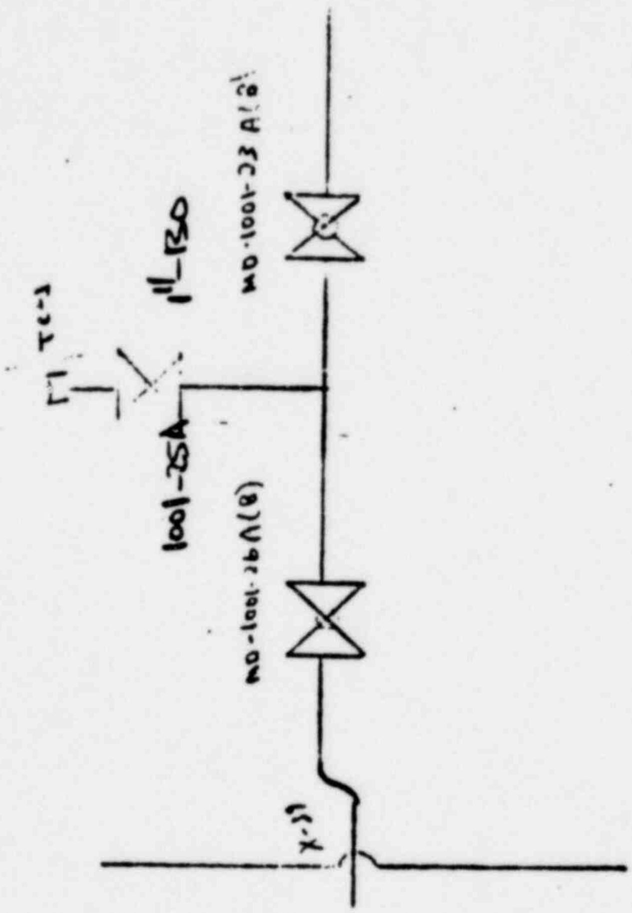
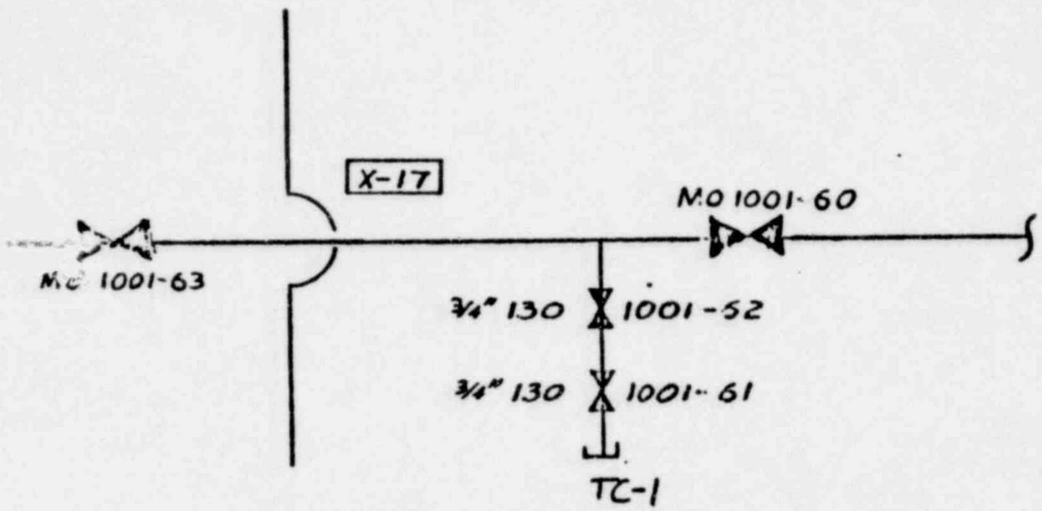


Fig 5



REACTOR VESSEL HEAD SPRAY

FIG. 6

POOR ORIGINAL

1470 169

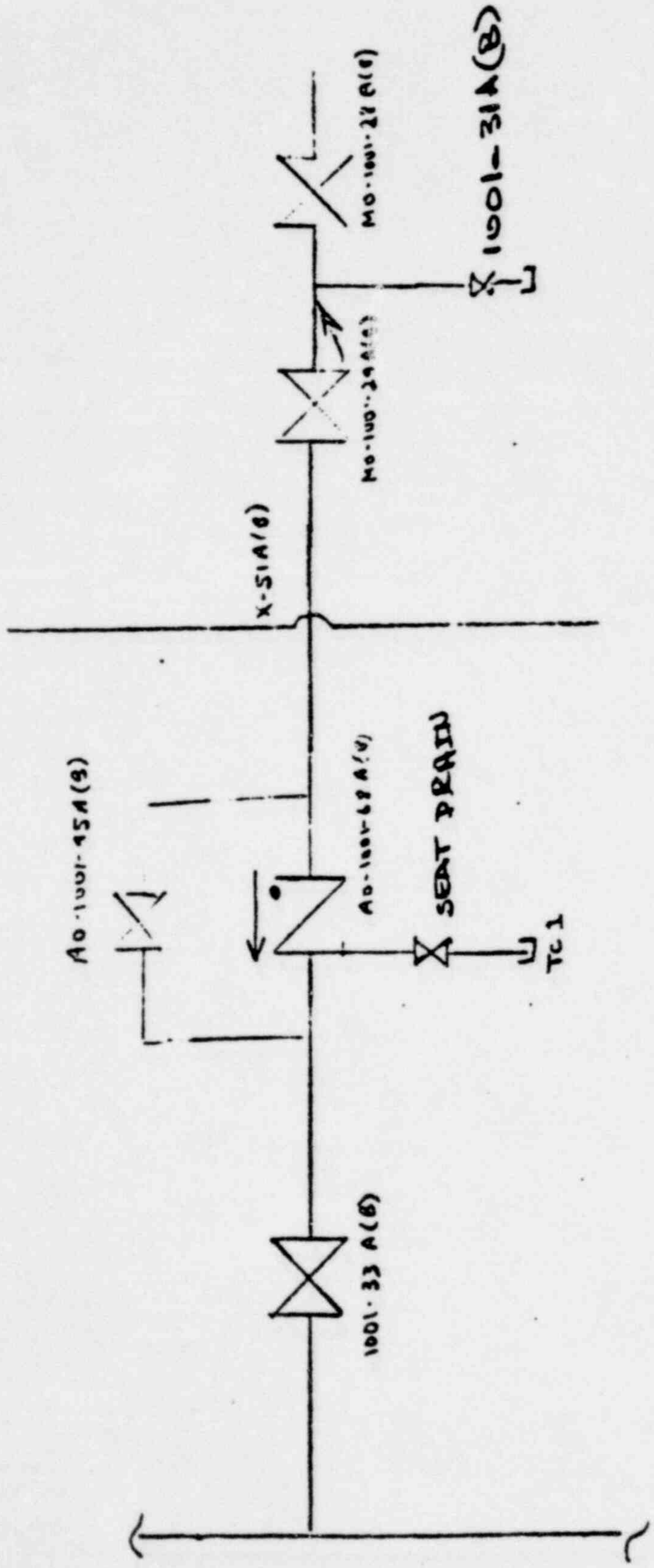


FIG. 7

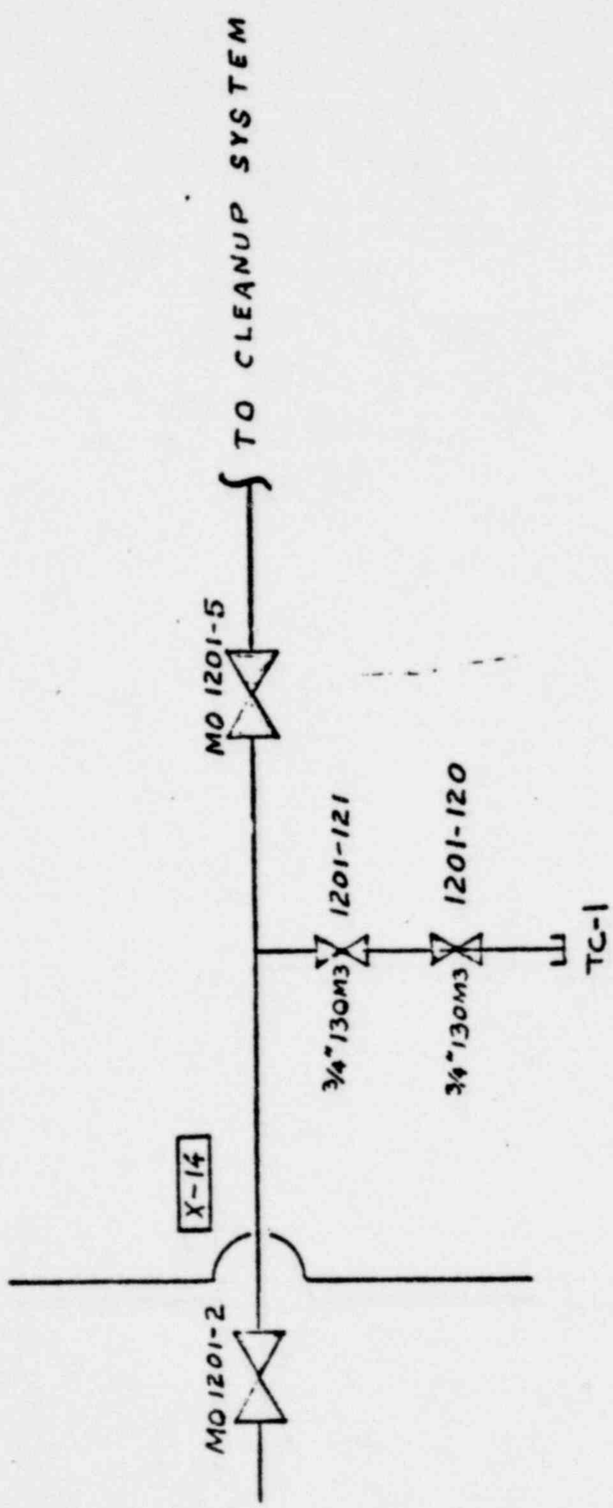


FIG. 8

1470 171

POOR ORIGINAL

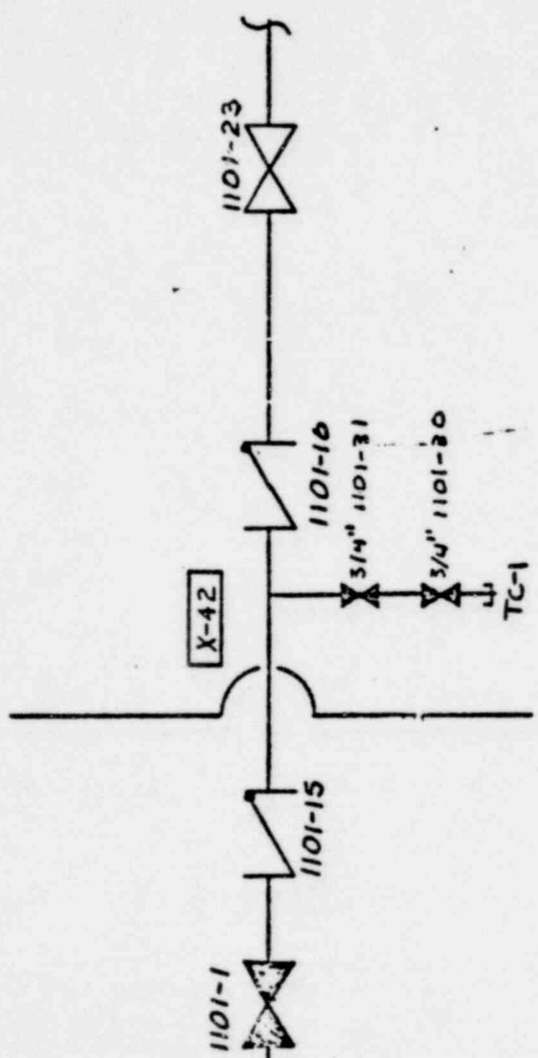
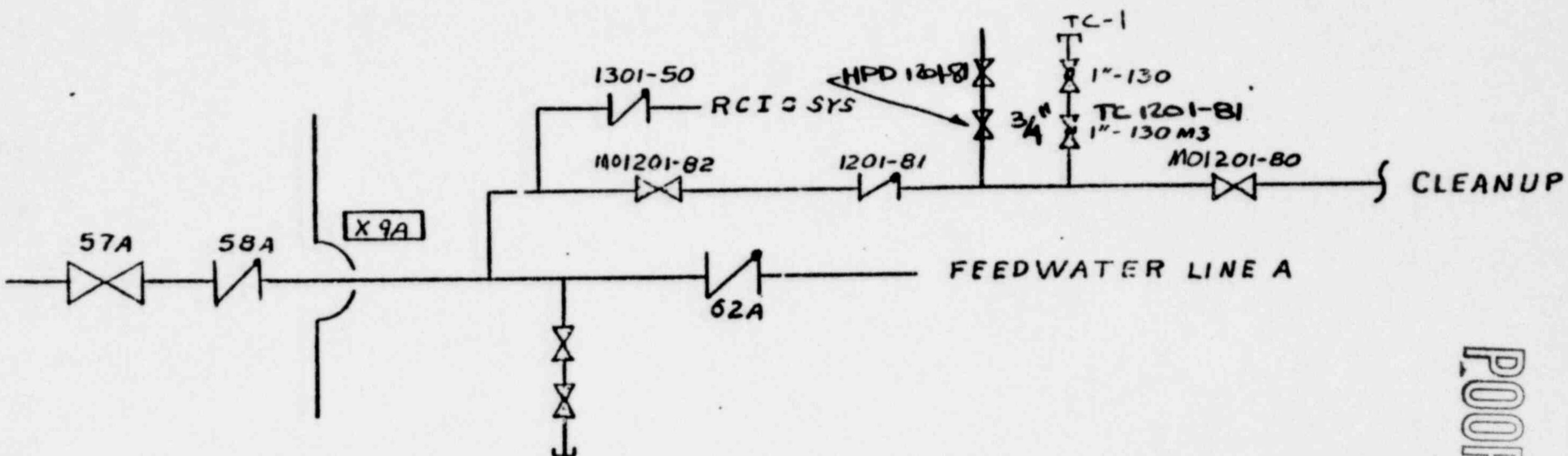


FIG. 9

1470 172



TC-1
1"-130
1301-50
RCIC SYS
3/4"
TC 1201-81
1"-130 M3
MO1201-82
1201-81
MO1201-80
CLEANUP
X 9A
57A
58A
FEEDWATER LINE A
62A

FIG. 10

POOR ORIGINAL

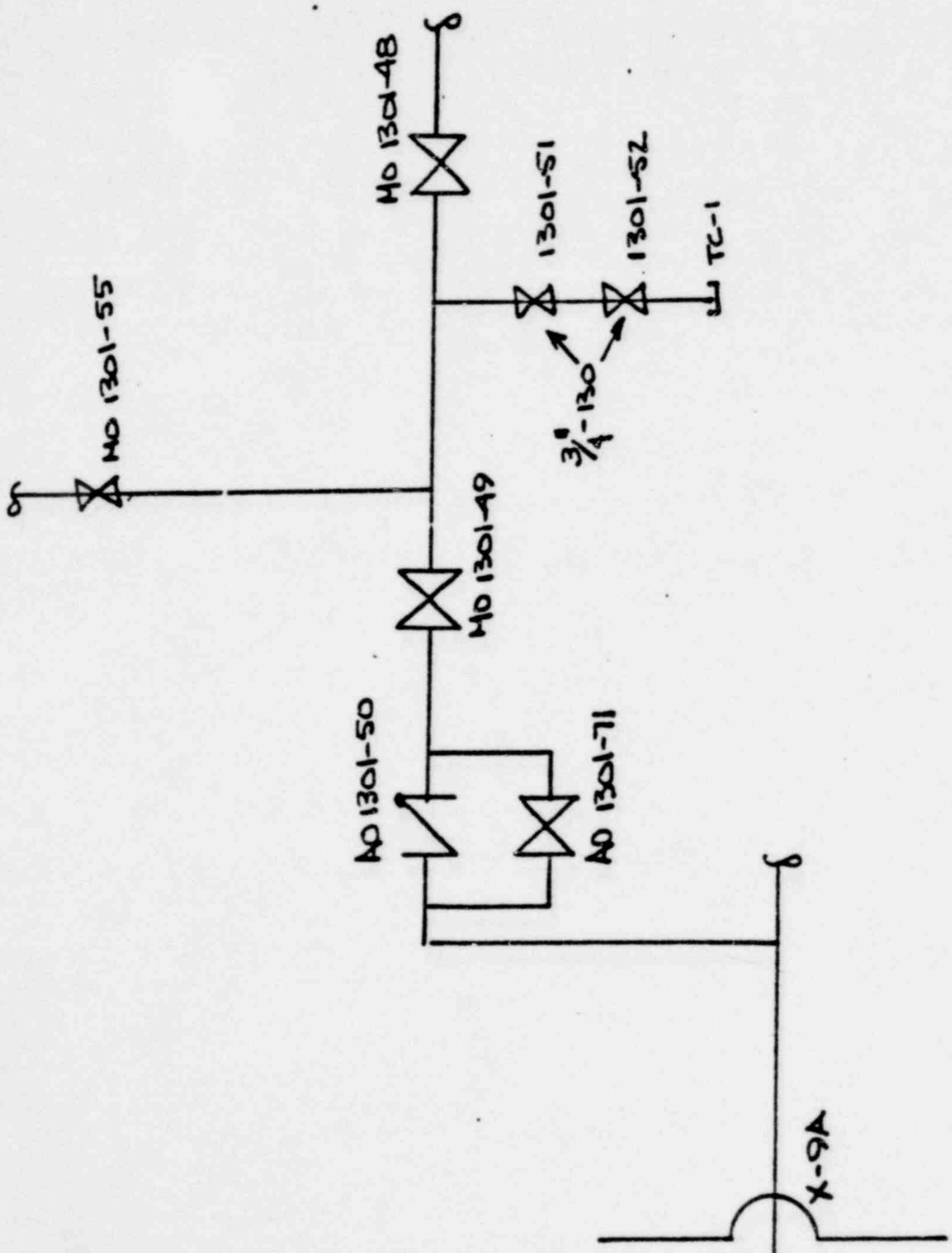


FIG. 11

1470 174

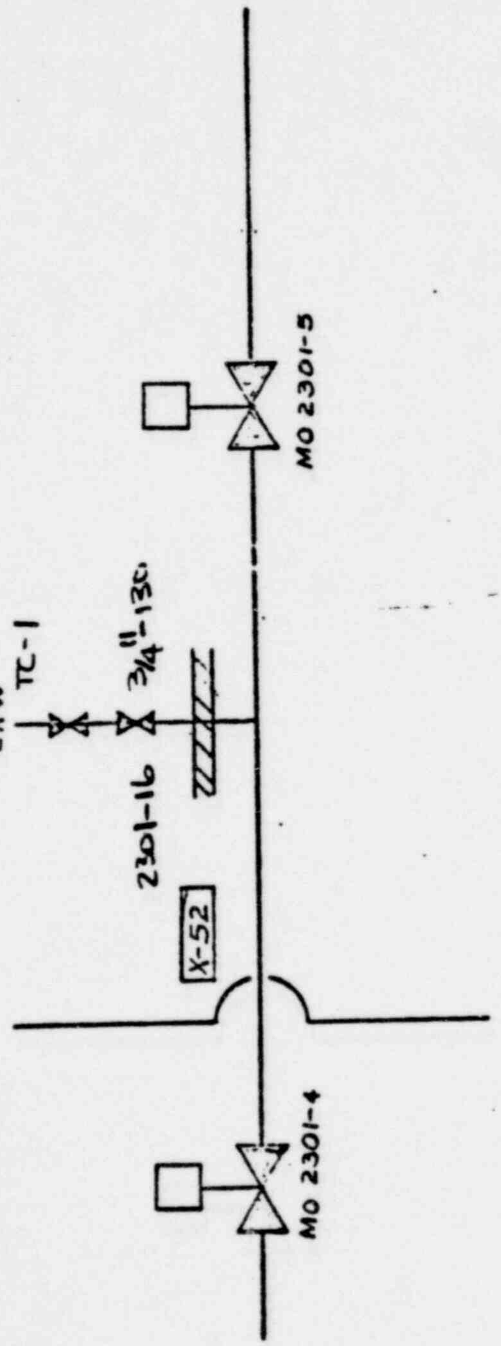
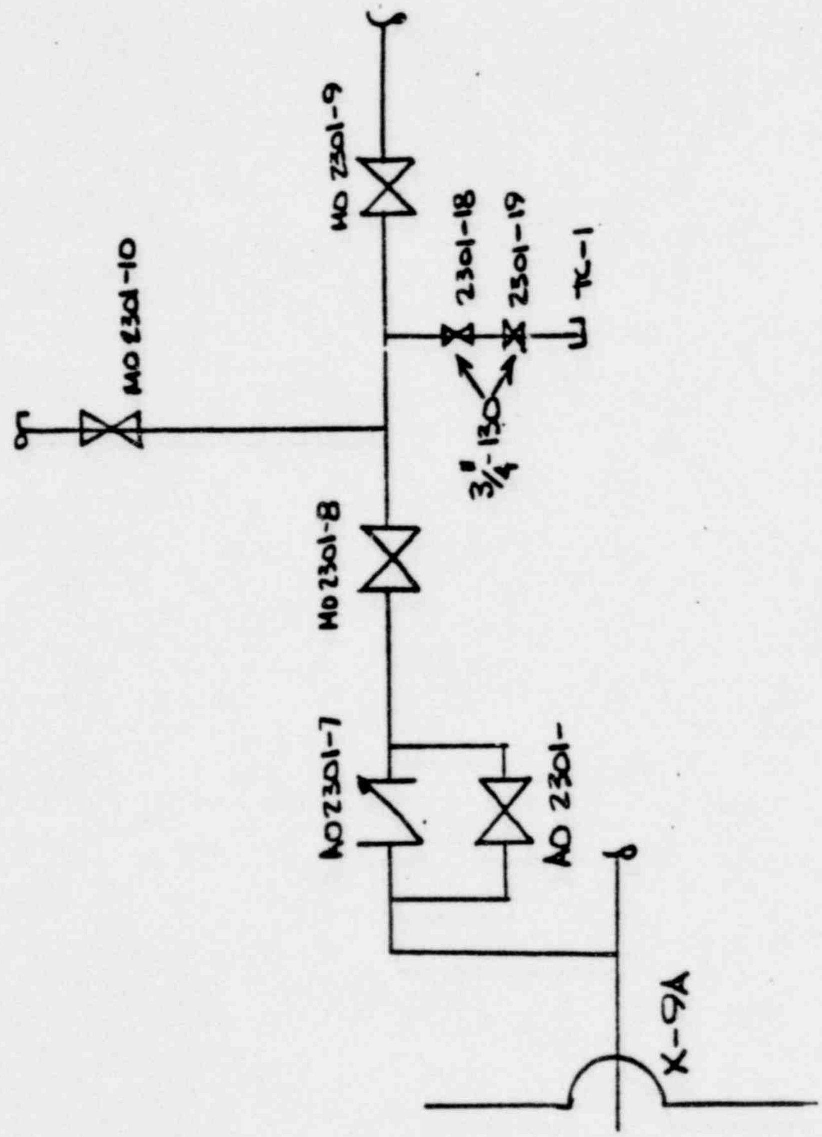


FIG. 12



MO 2301-10
MO 2301-9
2301-18
2301-19
TC-1
3/4"-130
MO 2301-8
AO 2301-7
AO 2301-
X-9A

FIG. 13

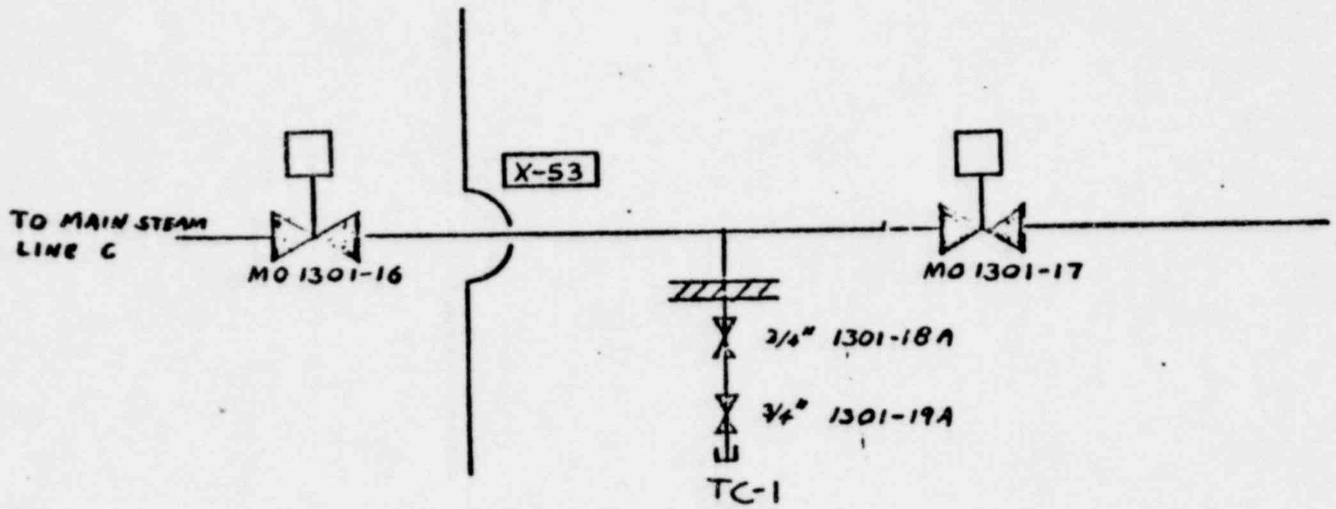

TO MAIN STEAM
LINE C
MO 1301-16
X-53
MO 1301-17
3/4" 1301-18A
3/4" 1301-19A
TC-1

FIG. 14

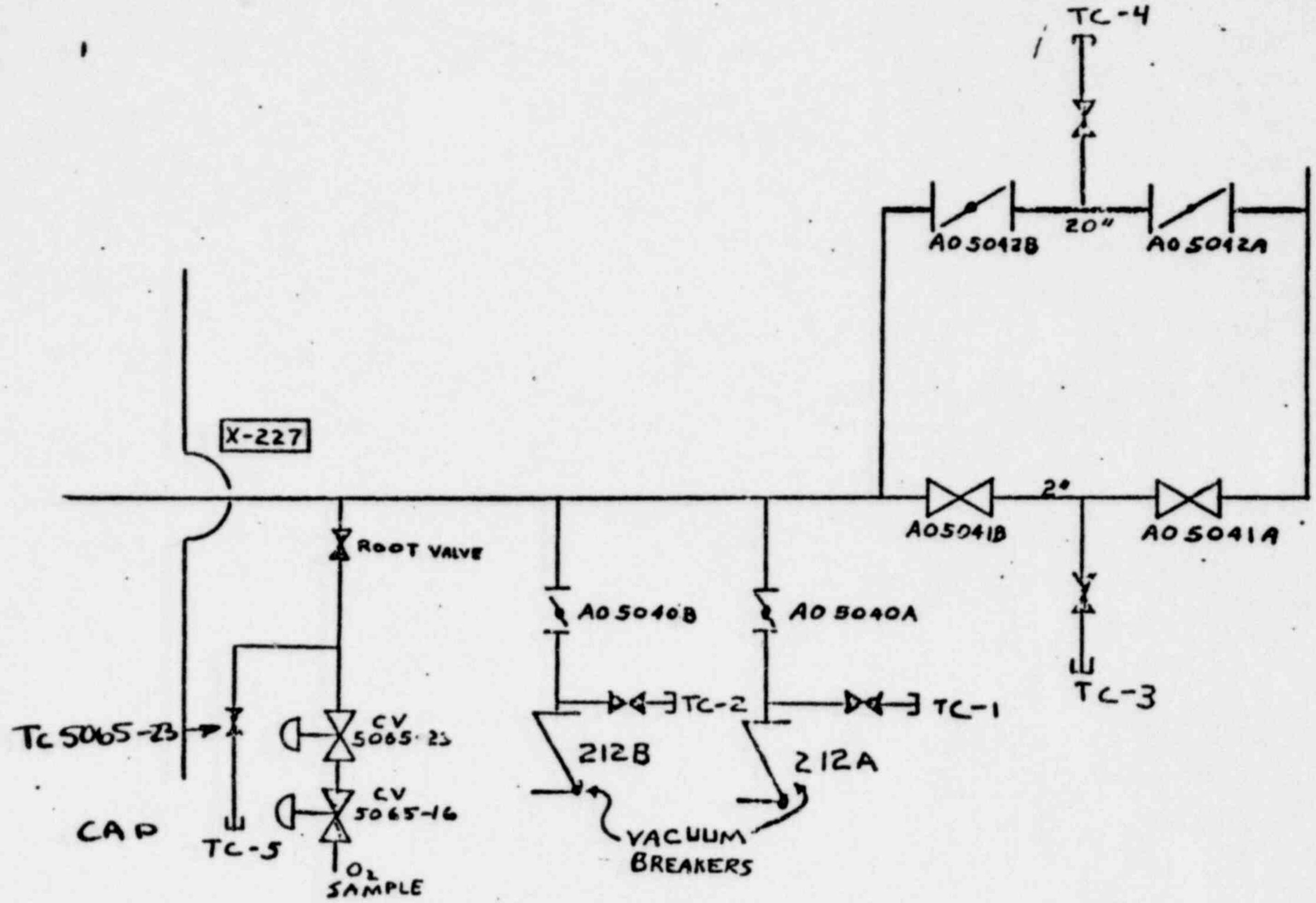


FIG. 15

1470 178

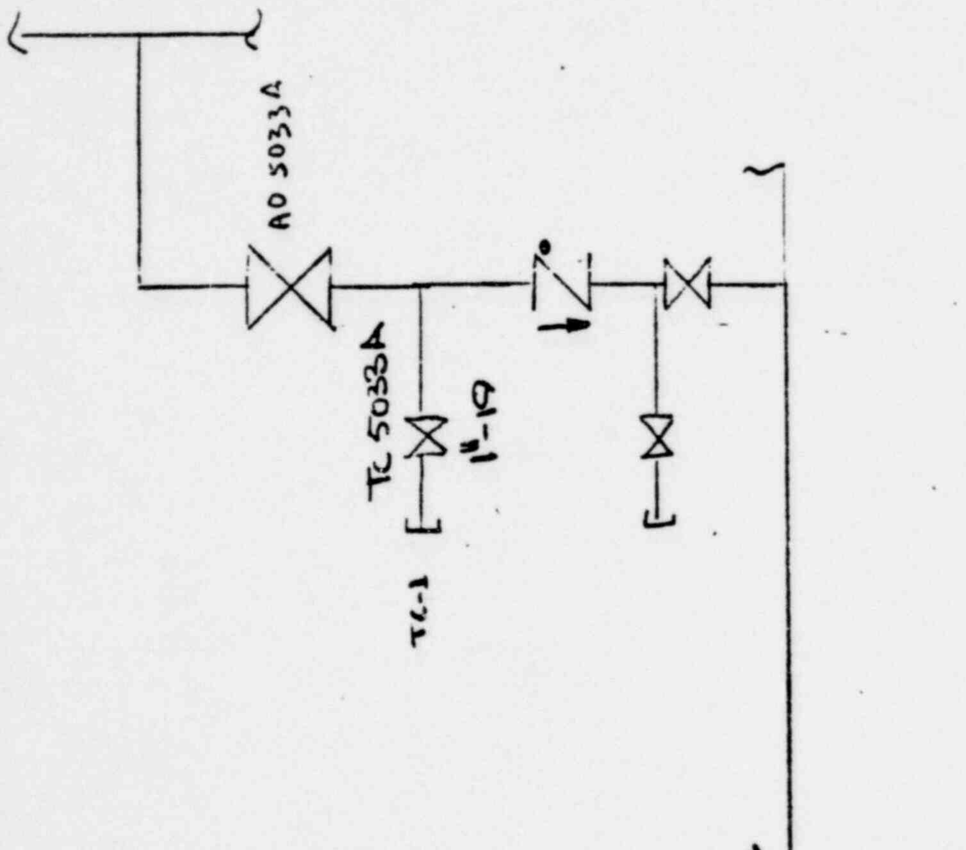


FiG. 16

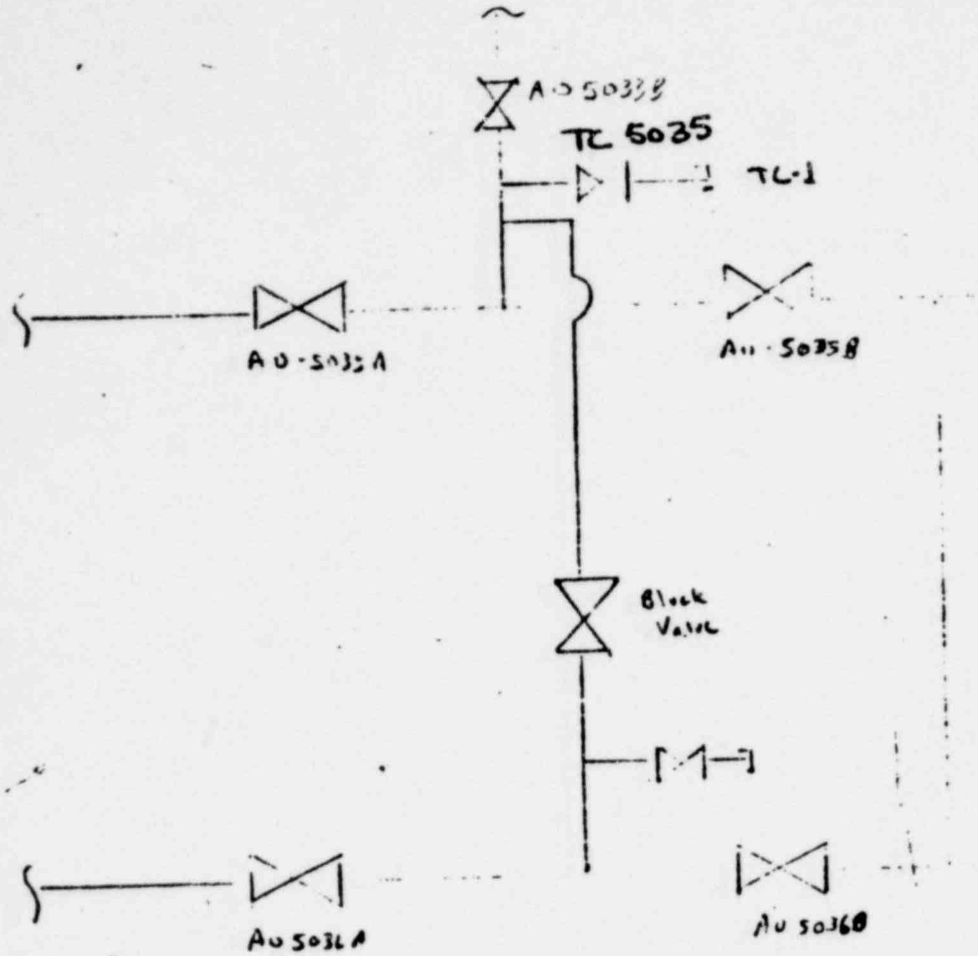


FIG. 17

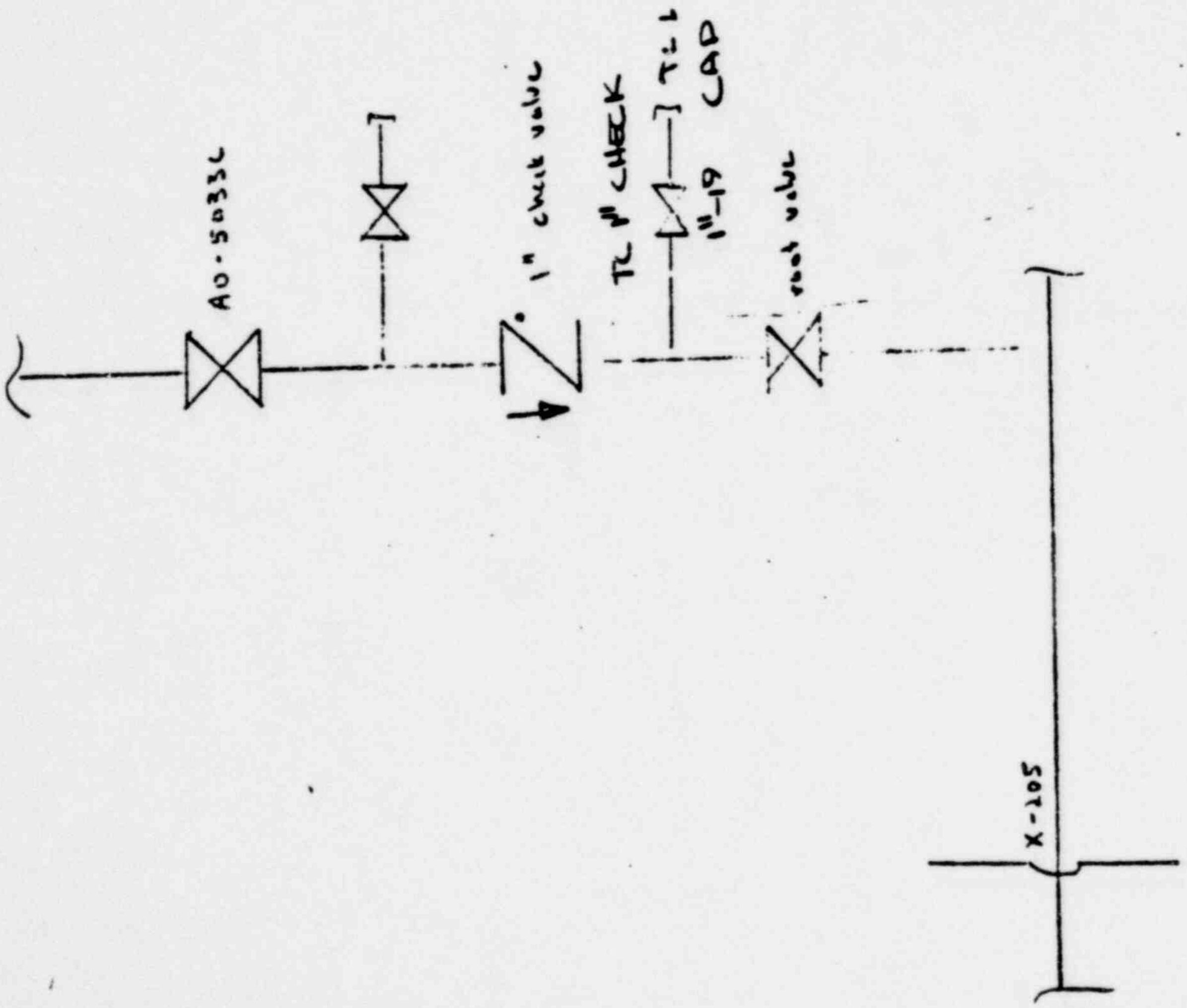


FIG. 18

POOR ORIGINAL

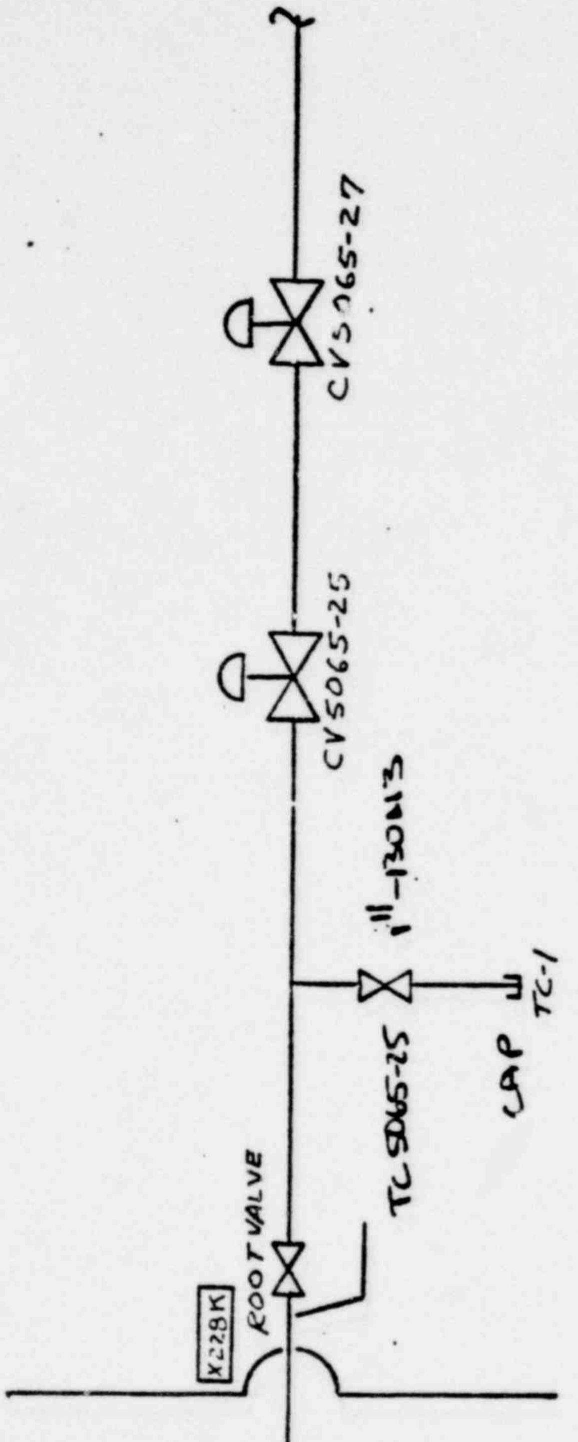


FIG. 19

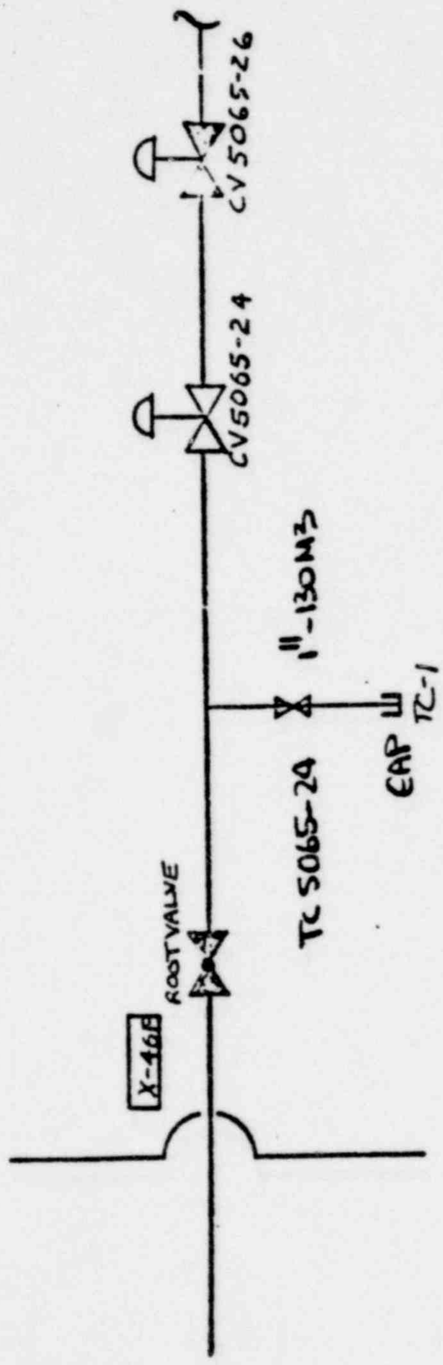


FIG. 20

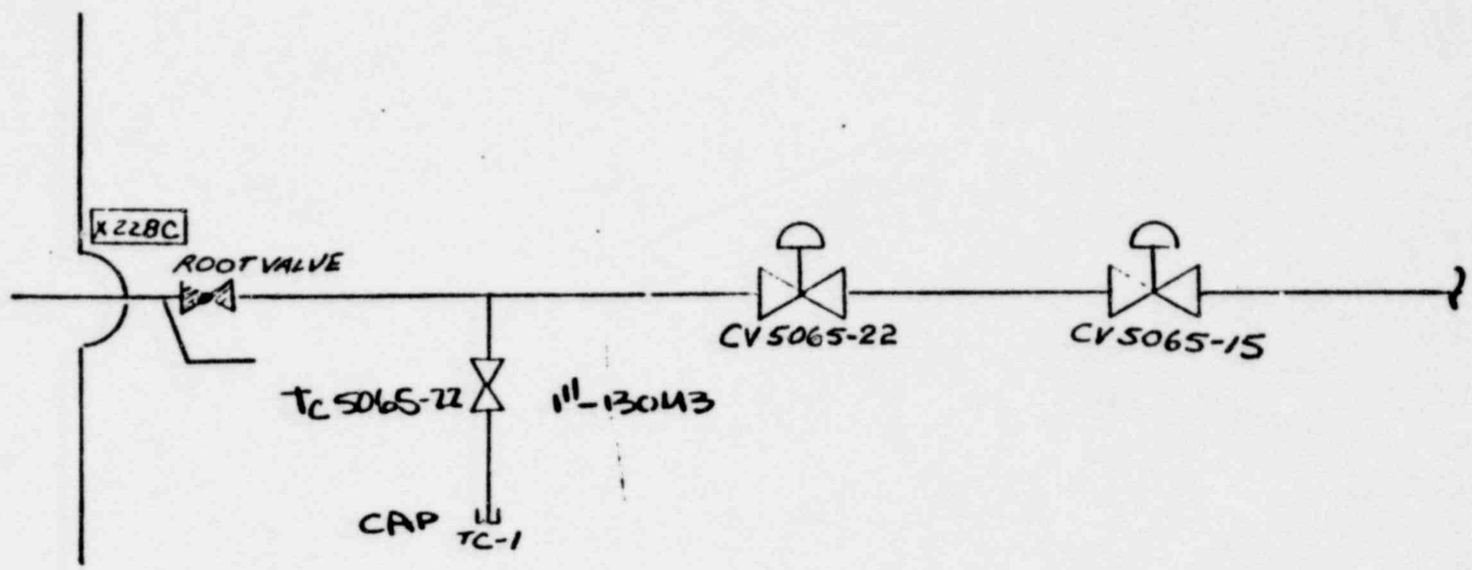

X228C
ROOT VALVE
CV 5065-22
CV 5065-15
TC 5065-22
1" – 130143
CAP
TC-1

FIG. 21

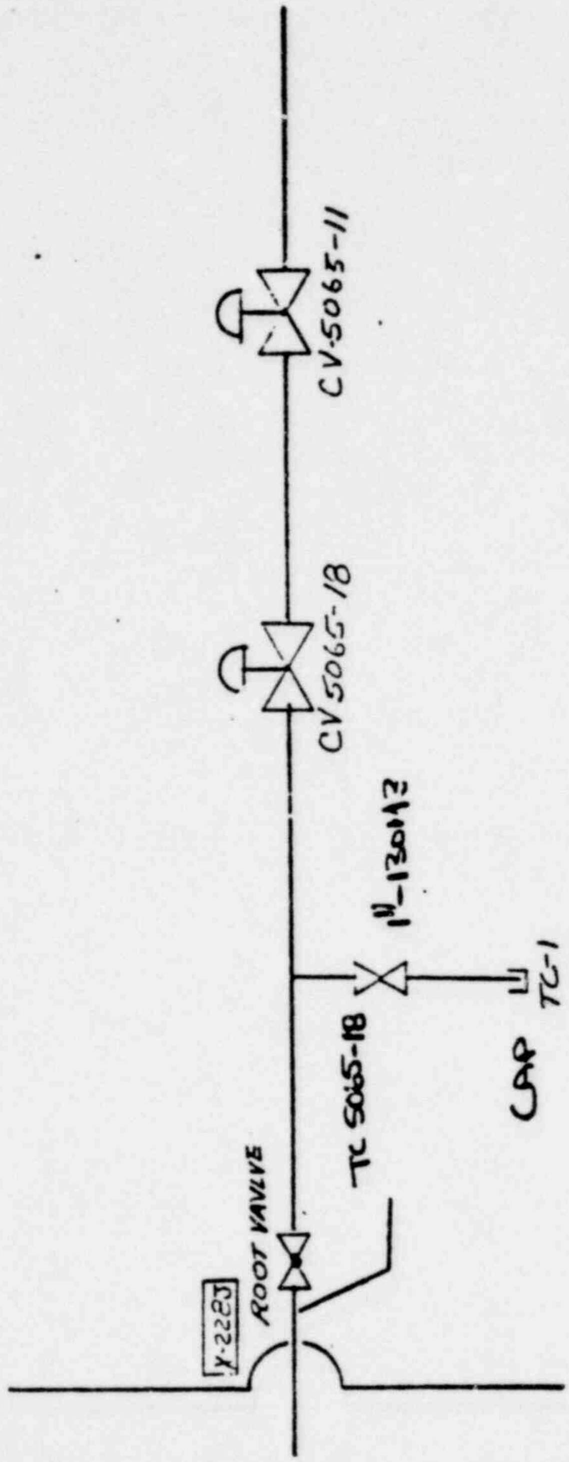


Fig. 22

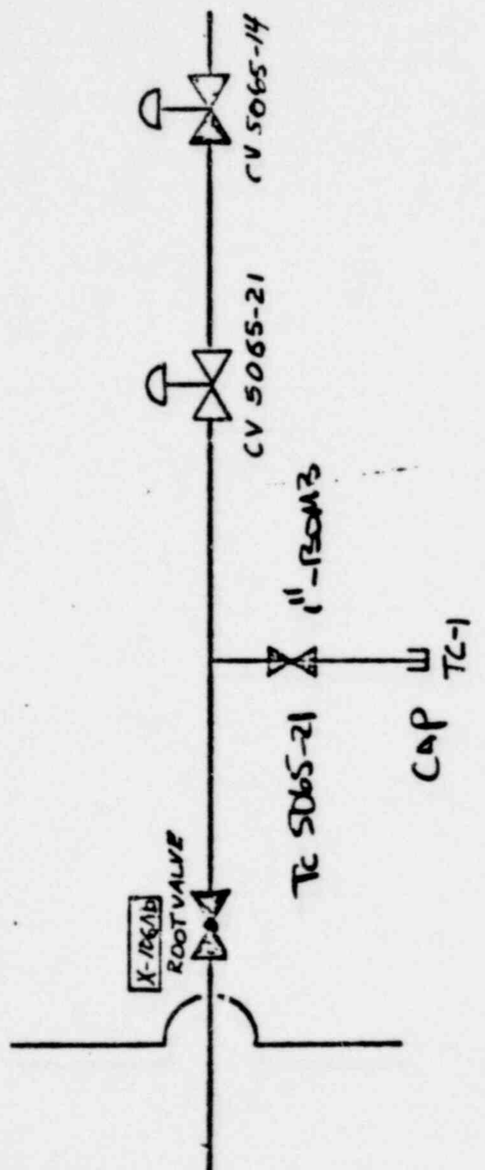


Fig 23

1470 186

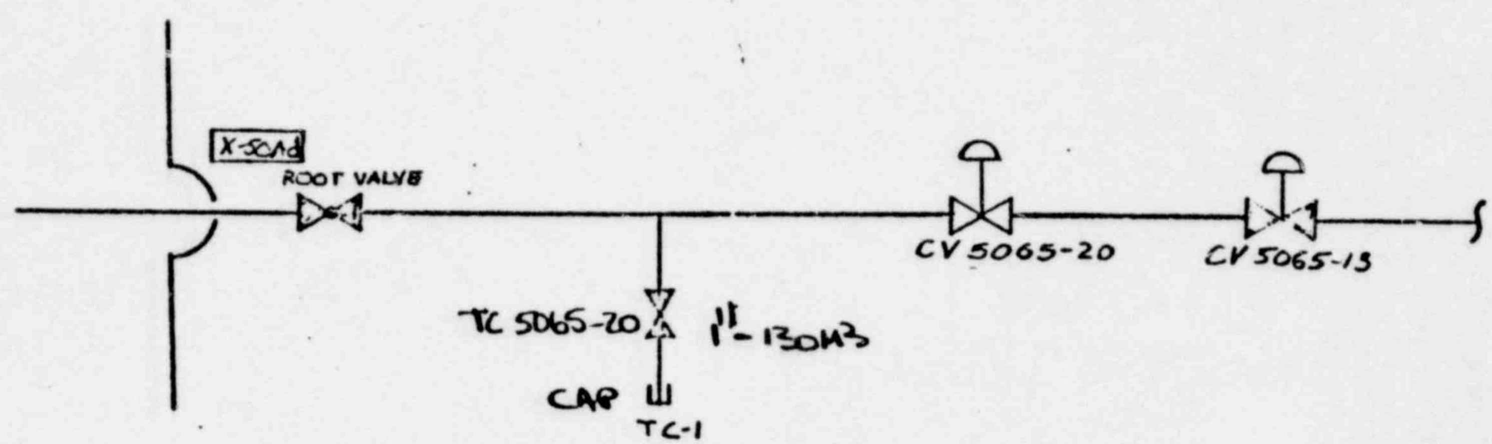

X-50Ad
ROOT VALVE
TC 5065-20
1"-130M3
CAP
TC-1
CV 5065-20
CV 5065-13

FIG. 24

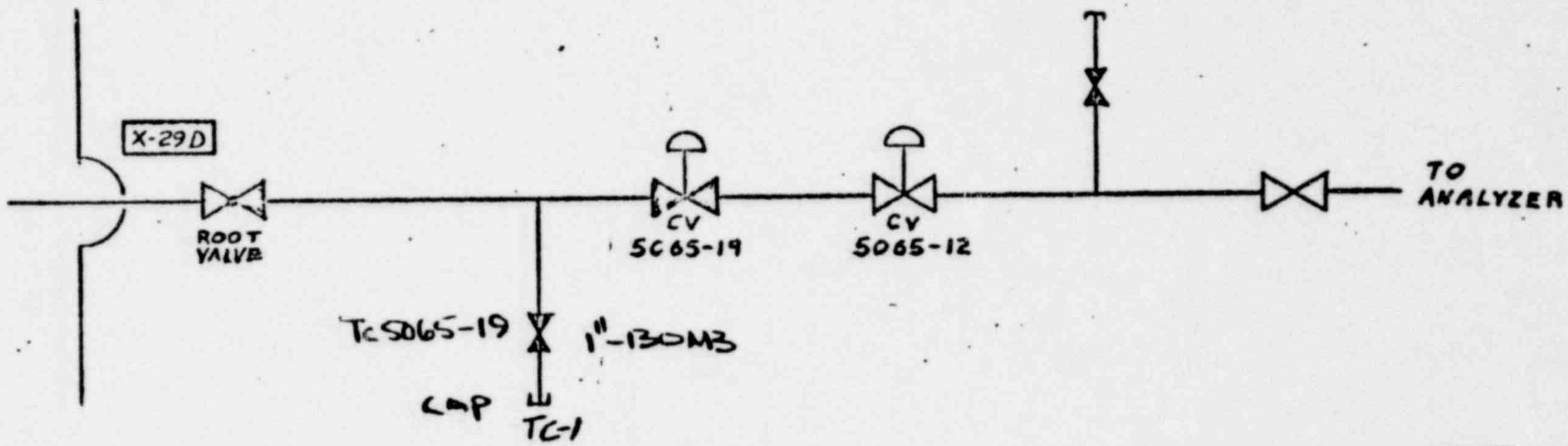

X-29D
ROOT VALVE
CV
5C65-19
CV
5065-12
TO ANALYZER
TcS065-19
1"-130MB
CAP
TC-1

FIG. 25

POOR ORIGINAL

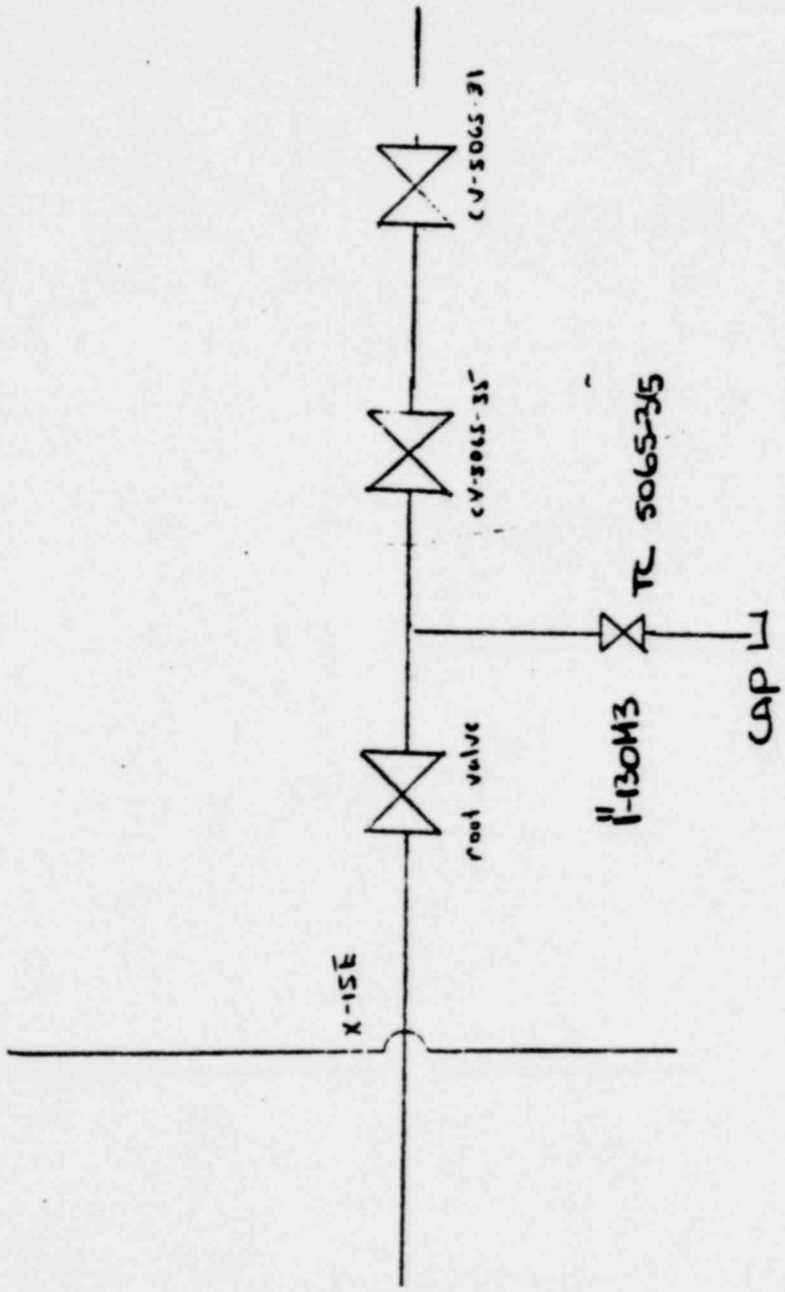


FIG. 26

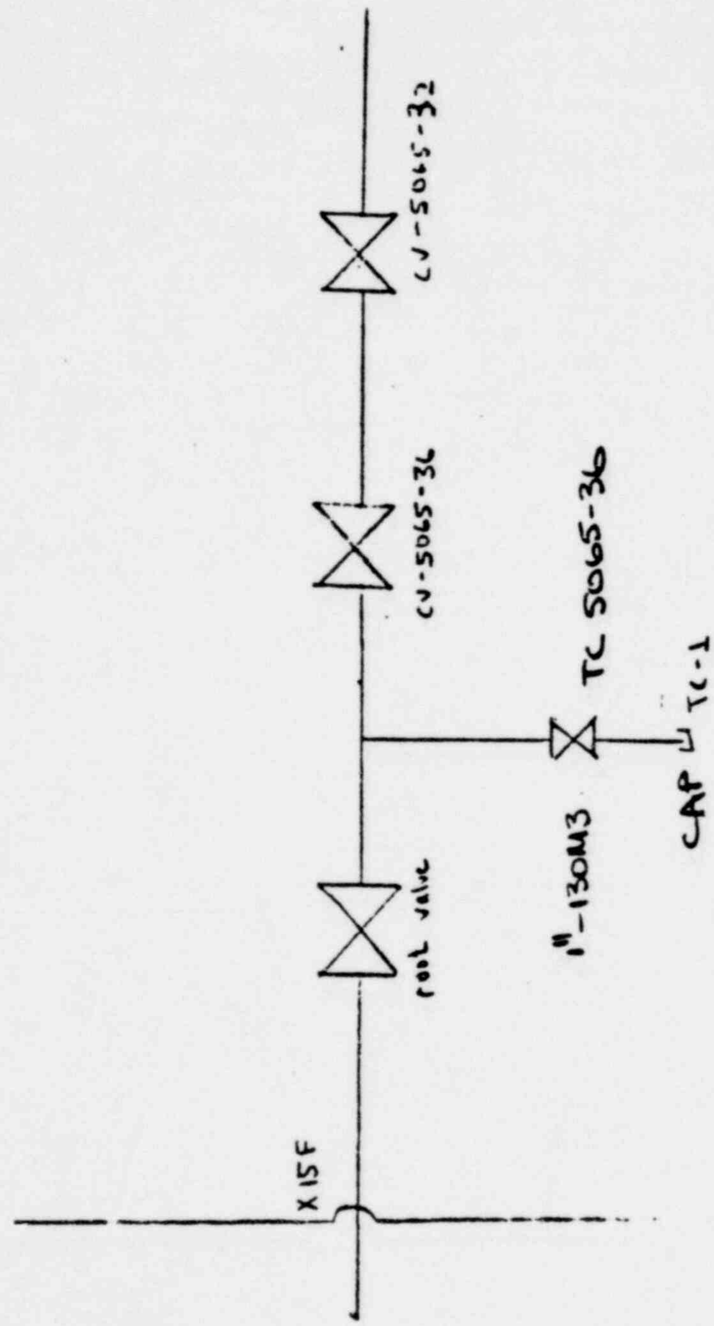


FIG. 27

POOR ORIGINAL

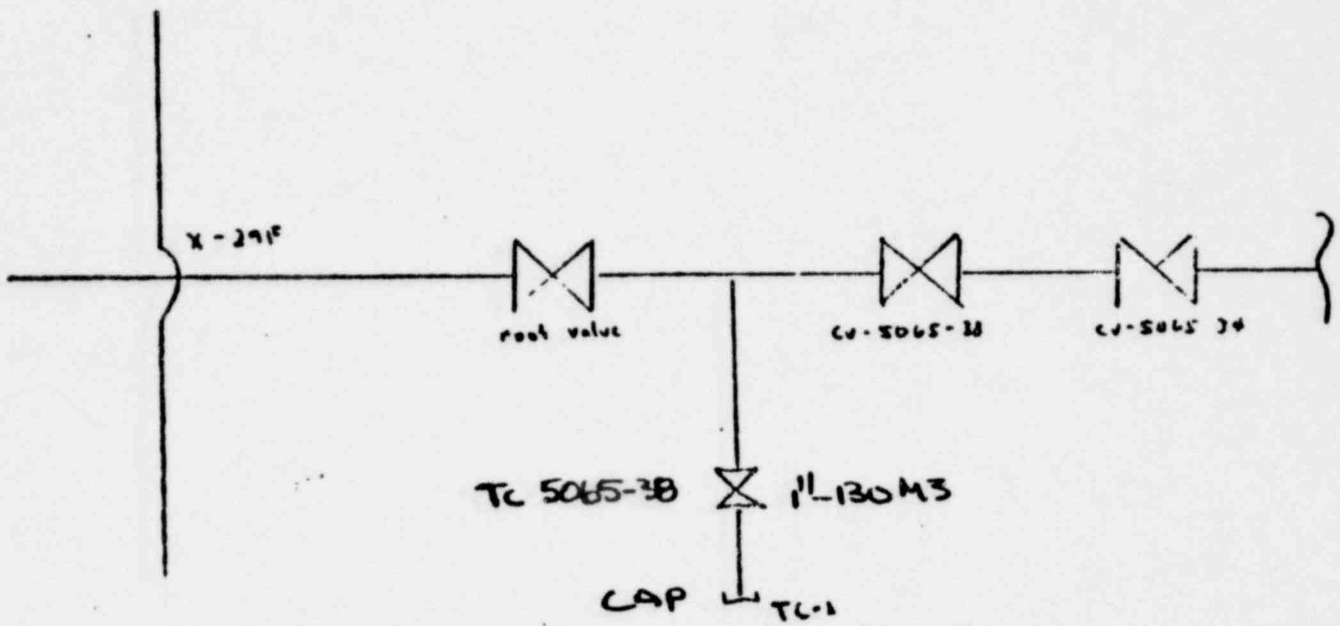


FIG. 28

1470 191

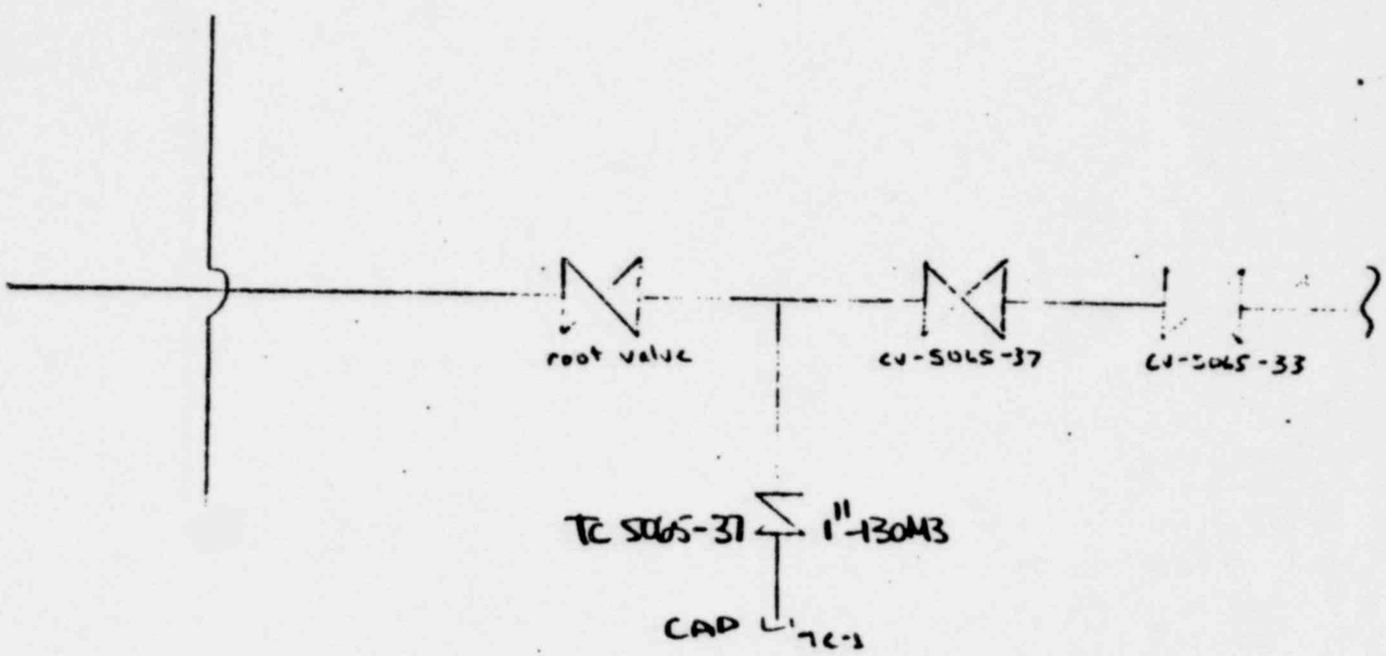


FIG. 29

1470 192

POOR ORIGINAL

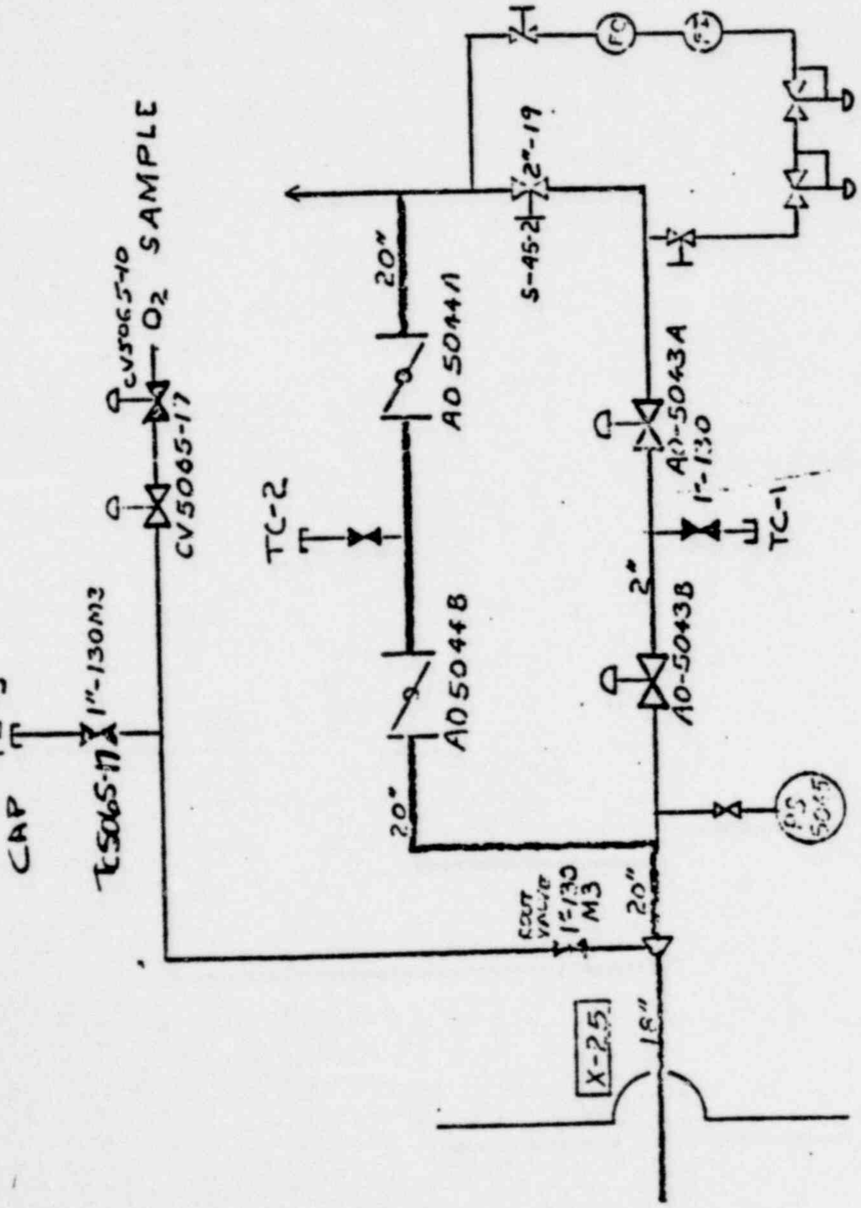


FIG. 30

1470 193

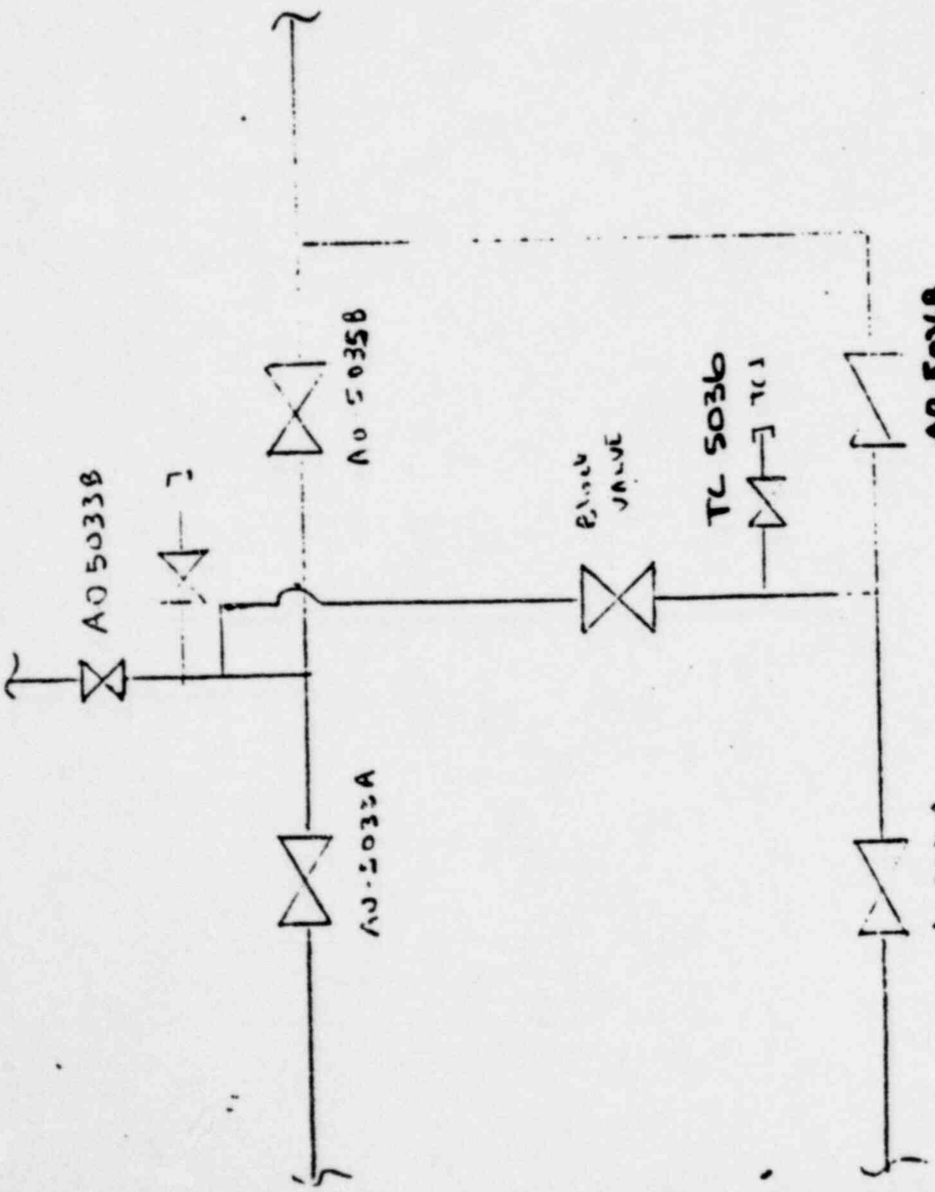


Fig 31

1470 194

TABLE 4.1-1
REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION FUNCTIONAL TESTS
MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTR. AND CONTROL CIRCUITS

	Group (2)	Functional Test	Minimum Frequency (3)
Mode Switch in Shutdown	A	Place Mode Switch in Shutdown	Each Refueling Outage
Manual Scram	A	Trip Channel and Alarm	Every 3 Months
RPS Channel Test Switch (5)	A	Trip Channel and Alarm	Each Refueling Outage
IRM			
High Flux	C	Trip Channel and Alarm (4)	Once Per Week During Refueling and Before Each Startup
Inoperative	C	Trip Channel and Alarm	Once Per Week During Refueling and Before Each Startup
APRM			
High Flux	B	Trip Output Relays (4)	Once/Week (7)
Inoperative	B	Trip Output Relays (4)	Once/Week
Downscale	B	Trip Output Relays (4)	Once/Week
Flow Bias	B	Calibrate Flow Bias Signal	Once/Month (1)
High Flux (15%)	B	Trip Output Relays (4)	Once Per Week During Refueling and Before Each Startup
High Reactor Pressure	A	Trip Channel and Alarm	(1)
High Drywell Pressure	A	Trip Channel and Alarm	(1)
Reactor Low Water Level (6)	A	Trip Channel and Alarm	(1)
High Water Level in Scram Discharge Tank	A	Trip Channel and Alarm	Every 3 Months
Turbine Condenser Low Vacuum	A	Trip Channel and Alarm	(1)
Main Steam Line High Radiation	B	Trip Channel and Alarm (4)	Once/Week
Main Steam Line Isolation Valve Closure	A	Trip Channel and Alarm	(1)
Turbine Control Valve Fast Closure	A	Trip Channel and Alarm	(1)
Turbine First Stage Pressure Permissive	A	Trip Channel and Alarm	Every 3 Months
Turbine Stop Valve Closure	A	Trip Channel and Alarm	(1)
Reactor Pressure Permissive	A	Trip Channel and Alarm	Every 3 Months

ATTACHMENT 6 (TABLES)

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NOTES FOR TABLE 4.1.1

1. Initially once per month until exposure (M as defined on Figure 4.1.1) is 2.0×10^5; thereafter, according to Figure 4.1.1 with an interval not less than one month nor more than three months. The compilation of instrument failure rate data may include data obtained from other boiling water reactors for which the same design instrument operates in an environment similar to that of PNPS.

2. A description of the three groups is included in the Bases of this Specification.

3. Functional tests are not required when the systems are not required to be operable or are tripped.

   If tests are missed, they shall be performed prior to returning the systems to an operable status.

4. This instrumentation is exempted from the instrument channel test definition. This instrument channel functional test will consist of injecting a simulated electrical signal into the measurement channels.

5. Test RPS channel after maintenance.

6. The water level in the reactor vessel will be perturbed and the corresponding level indicator changes will be monitored. This perturbation test will be performed every month after completion of the monthly functional test program.

7. This APRM testing will be performed once per week when in the run mode. If the reactor is out of the run mode for more than one week, the testing will be performed as soon as practicable after returning to the run mode.

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TABLE 4.1-2

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT CALIBRATION

MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Group (1)	Calibration Test (5)	Minimum Frequency (2)
IRM High Flux	C	Comparison to APRM on Controlled Shutdowns	Note (4)
APRM High Flux			
Output Signal	B	Heat Balance	Once every 3 Days
Flow Bias Signal	B	Internal Power and Flow Test	Each Refueling Outage
LPRM Signal	B	TIP System Traverse	Every 1000 Effective Full Power Hours
High Reactor Pressure	A	Standard Pressure Source	Every 3 Months
High Drywell Pressure	A	Standard Pressure Source	Every 3 Months
Reactor Low Water Level	A	Pressure Standard	Every 3 Months
High Water Level in Scram Discharge Volume	A	Note (6)	Note (6)
Turbine Condenser Low Vacuum	A	Standard Vacuum Source	Every 3 Months
Main Steam Line Isolation Valve Closure	A	Note (6)	Note (6)
Main Steam Line High Radiation	B	Standard Current Source (3)	Every 3 Months
Turbine First Stage Pressure Permissive	A	Standard Pressure Source	Every 6 Months
Turbine Control Valve Fast Closure	A	Standard Pressure Source	Every 3 Months
Turbine Stop Valve Closure	A	Note (6)	Note (6)
Reactor Pressure Permissive	A	Standard Pressure Source	Every 6 Months

NOTES FOR TABLE 4.1.2

1. A description of three groups is included in the bases of this Specification.

2. Calibration tests are not required when the systems are not required to be operable or are tripped.

3. The current source provides an instrument channel alignment. Calibration using a radiation source shall be made each refueling outage.

4. Maximum frequency required is once per week.

5. Response time is not a part of the routine instrument channel test, but will be checked once per operating cycle.

6. Physical inspection and actuation of these position switches will be performed during the refueling outages.

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TABLE 4.2.A

MINIMUM TEST AND CALIBRATION FREQUENCY FOR PCIS

	Instrument Channel (5)	Instrument Functional Test	Calibration Frequency	Instrument Check
1)	Reactor High Pressure	(1)	Once/3 months	None
2)	Reactor Low-Low Water Level	(1)	Once/3 months	Once/day
3)	Reactor High Water Level	(1)	Once/3 months	Once/day
4)	Main Steam High Temp.	(1)	Once/3 months	None
5)	Main Steam High Flow	(1)	Once/3 months	None
6)	Main Steam Low Pressure	(1)	Once/3 months	None
7)	Reactor Water Cleanup High Flow	(1)	Once/3 months	Once/day
8)	Reactor Water Cleanup High Temp.	(1)	Once/3 months	None

	Logic System Functional Test (4) (6)	Frequency
1)	Main Steam Line Isolation Vvs. Main Steam Line Drain Vvs. Reactor Water Sample Vvs.	Once/6 months
2)	RHR - Isolation Vv. Control Shutdown Cooling Vvs. Head Spray Discharge to Radwaste	Once/6 months
3)	Reactor Water Cleanup Isolation	Once/6 months
4)	Drywell Isolation Vvs. TIP Withdrawal Atmospheric Control Vvs. Sump Drain Valves	Once/6 months
5)	Standby Gas Treatment System Reactor Building Isolation	Once/6 months

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TABLE 4.2.B

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

	Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
1)	Reactor Water Level	(1)	Once/3 months	Once/day
2)	Drywell Pressure	(1)	Once/3 months	None
3)	Reactor Pressure	(1)	Once/3 months	None
4)	Auto Sequencing Timers	NA	Once/operating cycle	None
5)	ADS - LPCI or CS Pump Disch. Pressure Interlock	(1)	Once/3 months	None
6)	Undervoltage Relays	(1)	Once/operating cycle	None
7)	Trip System Bus Power Monitors	Once/operating cycle	NA	Once/day
8)	Recirculation System d/p	(1)	Once/3 months	Once/day
9)	Core Spray Sparger d/p	NA	Once/operating cycle	Once/day
10)	Steam Line High Flow (HPCI & RCIC)	(1)	Once/3 months	None
11)	Steam Line High Temp. (HPCI & RCIC)	(1)	Once/3 months	None
12)	Safeguards Area High Temp.	(1)	Once/3 months	None
13)	HPCI and RCIC Steam Line Low Pressure	(1)	Once/3 months	None
14)	HPCI Suction Tank Levels	(1)	Once/3 months	None

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PNPS

TABLE 4.2.B

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

Logic System Functional Test (4) (6)	Frequency	Remarks
1) Core Spray Subsystem	Once/6 months	
2) Low Press. Coolant Injection Subsystem	Once/6 months	
3) Containment Spray Subsystem	Once/6 months	
4) HPCI Subsystem	Once/6 months	
5) HPCI Subsystem Auto Isolation	Once/6 months	
6) ADS Subsystem	Once/6 months	
7) RCIC Subsystem Auto Isolation	Once/6 months	
8) Diesel Generator Initiation	Once/6 months	
9) Area Cooling for Safeguard System	Once/6 months	

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TABLE 4.2.C

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CONTROL ROD BLOCKS ACTUATION

Instrument Channel	Instrument Functional Test	Calibration	Instrument Check
1) APRM - Downscale	(1) (3)	Once/3 months	Once/day
2) APRM - Upscale	(1) (3)	Once/3 months	Once/day
3) IRM - Upscale	(2) (3)	Startup or Control Shutdown	(2)
4) IRM - Downscale	(2) (3)	Startup or Control Shutdown	(2)
5) RBM - Upscale	(1) (3)	Once/6 months	Once/day
6) RBM - Downscale	(1) (3)	Once/6 months	Once/day
7) SRM - Upscale	(2) (3)	Startup or Control Shutdown	(2)
8) SRM - Detector Not in Startup Position	(2) (3)	Startup or Control Shutdown	(2)
9) IRM - Detector Not in Startup Position	(2) (3)	Startup or Control Shutdown	(2)

Logic System Functional Test (4) (6)	Frequency
(1) System Logic Check	Once/6 months

PNPS

TABLE 4.2.D

MINIMUM TEST AND CALIBRATION FREQUENCY FOR RADIATION MONITORING SYSTEMS

Instrument Channels	Instrument Functional Test	Calibration	Instrument Check (2)
1) Refuel Area Exhaust Monitors - Upscale	(1)	Once/3 months	Once/day
2) Refuel Area Exhaust Monitors - Downscale	(1)	Once/3 months	Once/day
3) Off-Gas Radiation Monitors	(1)	Once/3 months	Once/day

Logic System Functional Test (4) (6)	Frequency
1) Reactor Building Isolation	Once/6 months
2) Standby Gas Treatment System Actuation	Once/6 months
3) Steam Jet Air Ejector Off-Gas Line Isolation	Once/6 months

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TABLE 4.2.E

MINIMUM TEST AND CALIBRATION FREQUENCY FOR DRYWELL LEAK DETECTION

	Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
1)	Equipment Drain Sump Flow Integrator	(1)	Once/3 months	Once/day
2)	Floor Drain Sump Flow Integrator	(1)	Once/3 months	Once/day
3)	Air Sampling System	(1)	Once/3 months	Once/day