

*Central File*

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April 15, 1980

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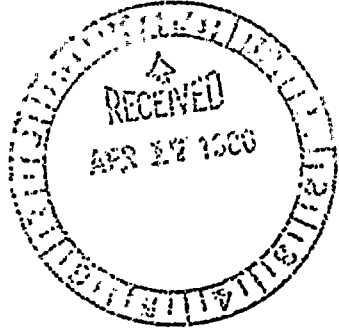
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Walnut Creek Plaza, Suite 202  
Walnut Creek, California 94596

Re: Docket No. 50-275  
Docket No. 50-323  
Diablo Canyon Units 1 and 2



Dear Mr. Engelken:

The attached material is submitted in response to IE Bulletin 79-27, Loss of Non-Class IE Instrumentation and Control Power System Bus During Operation.

Very truly yours,

*Philip A. Crane, Jr.*

Attachment

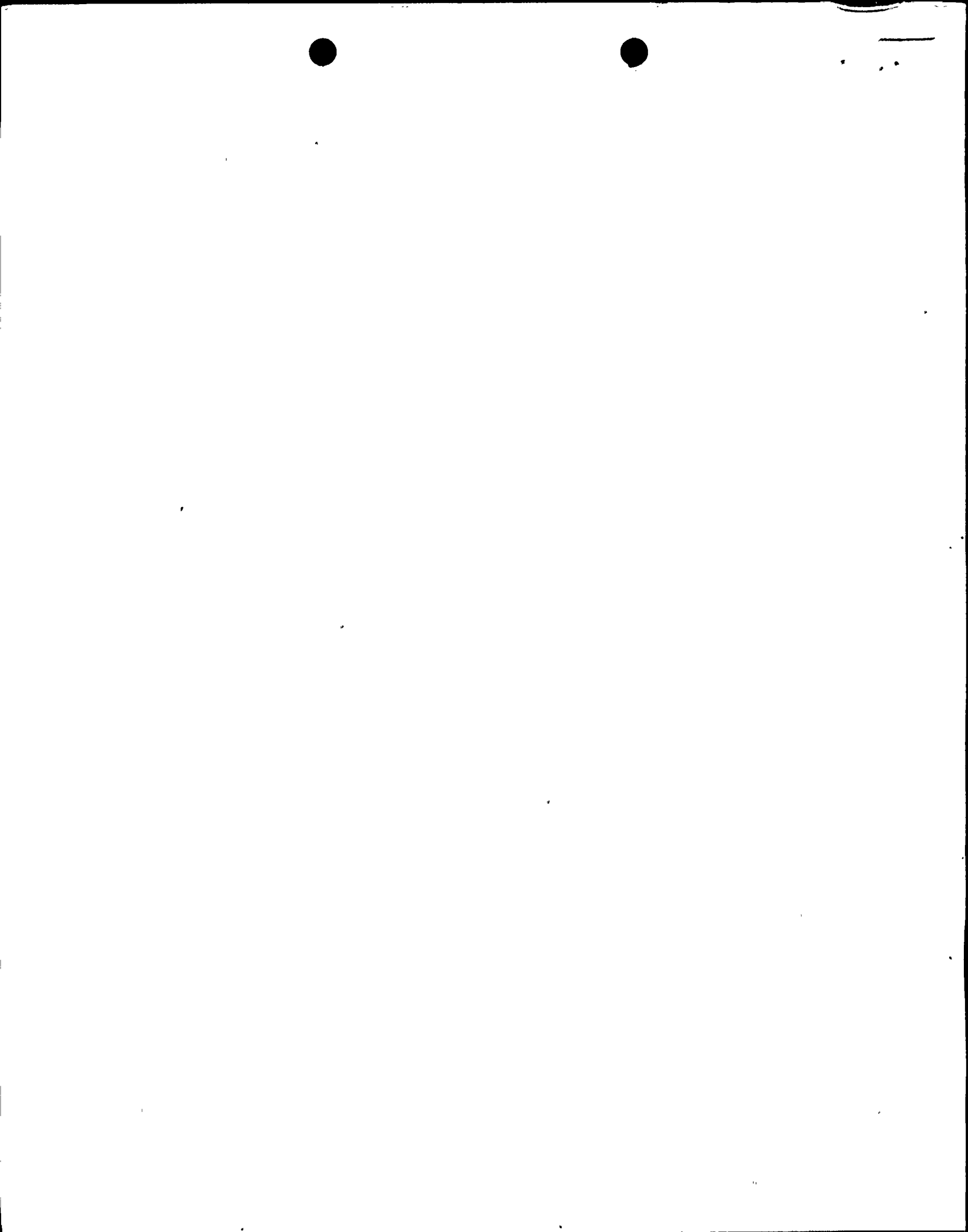
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Division of Reactor Operations Inspection  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

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Attachment

Response to IE Bulletin No. 79-27

1. Review the Class I-E and non-class I-E buses supplying power to safety and non-safety related instrumentation and control systems which could affect the ability to achieve a cold shutdown condition using existing procedures or procedures developed under item 2 below. For each bus:
  - a. Identify and review the alarm and/or indication provided in the control room to alert the operator to the loss of power to the bus.

PGandE Response:

Loss of power to Class IE buses is audibly alarmed at the annunciator in the control room. This alarm is also visually indicated on the annunciator. Loss of power to non-Class IE buses is neither audibly alarmed nor is there any visual indication in the control room.

- b. Identify the instrument and control system loads connected to the bus and evaluate the effects of loss of power to these loads including the ability to achieve a cold shutdown condition.

PGandE Response:

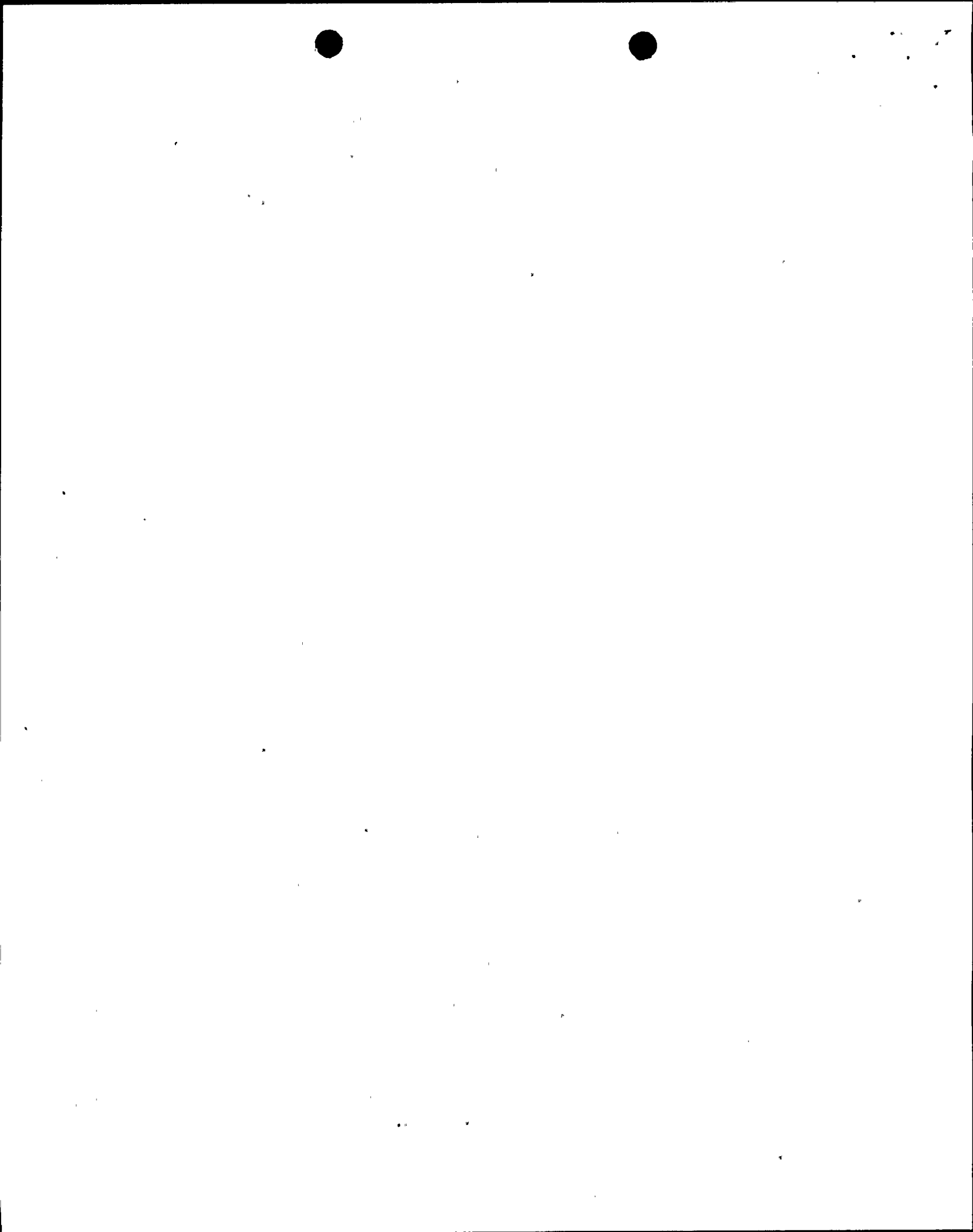
Attachment A identifies bus assignments of Class IE and non-Class IE instruments and control system loads. Attachment A also indicates for each load whether or not the loss of that load will adversely affect cold shutdown. We have reviewed the load assignments on the buses and have determined that the loads are distributed such that loss of any one of the instrument panels would not adversely affect cold shutdown. Furthermore, tripping of the 480 VAC feeder breaker would not cause loss of power to instrument inverters because there are two additional power sources for each panel assigned to a bus:

- 1) The 125V DC battery, which is automatically switched on loss of AC; and
- 2) Another AC bus by manual switch-over.

- c. Describe any proposed design modifications resulting from these reviews and evaluations, and your proposed schedule for implementing those modifications.

PGandE Response:

We will make the following design modifications prior to May 1, 1980, as a result of our review and evaluation:



- 1) Prevent the 480 VAC feeder to the vital 480/120 VAC instrument inverters from tripping on high voltage transients on the vital 480 VAC buses. This will be accomplished by regulating the 480 volt input power to the 120 VAC instrument inverters or by using voltage surge suppressors on the input of the vital 120 VAC instrument inverter.
  - 2) Provide an overvoltage alarm on the 480 VAC feeder to the 480/120 VAC instrument inverters to alarm when the breaker has tripped on overvoltage. Tripping of the 480 volt feeder breakers would not cause loss of power, as explained above, to any instrument or control system loads.
2. Prepare emergency procedures or review existing ones that will be used by control room operators, including procedures required to achieve a cold shutdown condition, upon loss of power to each class I-A and non-class 1-E bus supplying power to safety and non-safety related instrument and control systems. The emergency procedures should include:
- a) the diagnostics/alarms/indicators/symptom resulting from the review and evaluation conducted per item 1 above.  
  
See response below.
  - b) the use of alternate indication and/or control circuits which may be powered from other non-class 1-E or class 1-E instrumentation and control buses.  
  
See response below.
  - c) methods for restoring power to the bus.  
  
See response below.

Describe any proposed design modification or administrative controls to be implemented resulting from these procedures, and your proposed schedule for implementing the changes.

PGandE Response:

We do not anticipate any changes in existing administrative controls as a result of these procedures.

We are presently in the process of reviewing our emergency procedures dealing with these conditions. Some modifications will be necessary.

We expect to have the procedures completed and implemented by May 1, 1980.



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3. Re-review IE Circular No. 79-02, Failure of 120 Volt Vital AC Power Supplies, dated January 11, 1979, to include both class 1-E and non-class 1-E safety-related power supply inverters. Based on a review of operating experience and your re-review of IE Circular No. 79-02, describe any proposed design modifications or administrative controls to be implemented as a result of the re-review.

PGandE Response:

We have re-reviewed IE Circular 79-02 and have found that there are no design modifications or administrative controls to be implemented as a result of including both Class 1-E and non-class 1-E safety-related power systems.





Attachment A

Class 1-E

Panel 11 Instrument AC Distribution  
Channel I (Py 11)

<u>Breaker</u> <u>No.</u>	<u>Description</u>	<u>Affect Cold Shutdown</u>	
		<u>Yes</u>	<u>No</u>
1111	Nis. Chan. I Cab 'A' Control Panel		X
1112	Nis. Chan. I Cab 'A' Instr. Power		X
1113	Rack Nu. Prot. Set 1 Cub. 'A' RNPIA		X
1114	Rack Nu. Contr. Set 1 Cub. 'A'		X
1115	Rack Nu. Safeguard Input A		X
	Rack Nu. Safeguard Output A		
1116	Rack Nu. Safeguard Input 'B'		X
1117	Volume Contr. Tank PM96		X
1118	CNT Hydrogen Monitor ANI23 120V RCPT		X
1119	Demin. & Make-Up Water Control CC2. Control Console Instr. Bus		X
1120	Chem. & Volume Contr. System CW Main Contr. Board Instr. Bus		X
1121	Radiation Monitor System Rack A		X
1122	Auxiliary FW13 Instr. HIC 72, 73, HØ1		X
1123	Rack Nu. Safeguard Test 'A'		X
1124	Main Contr. Board Status Light Channel I		X
1125	Auxiliary Safeguard Cabinet Train 'A'		X
1126	RCPl1 Leakage Press. Instr.		X
1127	Ground Detector 125/250V DC Buses SD121		X
1128	Contr. Rm. Vent. Isol. Auxiliary Relays PCRA		X
1129	Safeguard Vent. Logic Cabinet PØV1		X
1130	CCW Hdr A Instr. Panel A PIA		X
1131	Elec. Rm. Temp. Mon. PTM11		X
1132	Back-Up Air Supply 10% Stm. Dump Stm. Gen. 1-1, 1-2, XSV516G		X
1133	Seismic Orthogonal Triggers ENST1A		X
1134	Spare		



Class 1-E

Panel 12 Instrument AC Distribution

Channel II (Py 12)

Breaker No.	Description	Affect Cold Shutdown	
		Yes	No
1211	Nis. Chan. II Cab 'B' Control Power		X
1212	Nis. Chan. II Cab 'B' Instr. Power		X
1213	Rack Nu. Prot. Set 2 Cub. A		X
1214	Rack Nu. Contr. Set 2 Cub. A		X
1215	Rack Nu. Safeguard Input A		X
1216	Rack Nu. Safeguard Input B		X
1217	Misc. Instr. PML18		X
1218	Charcoal Filter Preheater Temp. Control		X
1219	Demin. & Make-Up Water Control CC2. Control Console Instr. Bus		X
1220	Chem. & Volume Contr. System CNV Main Contr. Board Instr. Bus		X
1221	CNT Hydrogen Mon. ANI23 120V Rept.		X
1222	Auxiliary Relay Rack 'A' RNARA		X
1223	Main Control Board Status Light Channel II		X
1224	Gen. Relay Board (1)		X
1225	Auxiliary Safeguard Cab. Train B		X
1226	RCPL2 Leakage Press. Instr.		X
1227	ESF Equip. Rm. Temp. Mon. PTM01		X
1228	Seismic Instr. Rack RS1A		X
1229	Back-Up Air Supply 10% Stm. Dump Stm. Gen. 1-3, 1-4, XSV536G		X
1230	CCW Hdr B Instr. Panel B PIB		X
1231	Spare		X
1232	Seismic Orthogonal Triggers ENST2A		X



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Class 1-E

Panel 13 Instrument AC Distribution  
Channel III (Py 13)

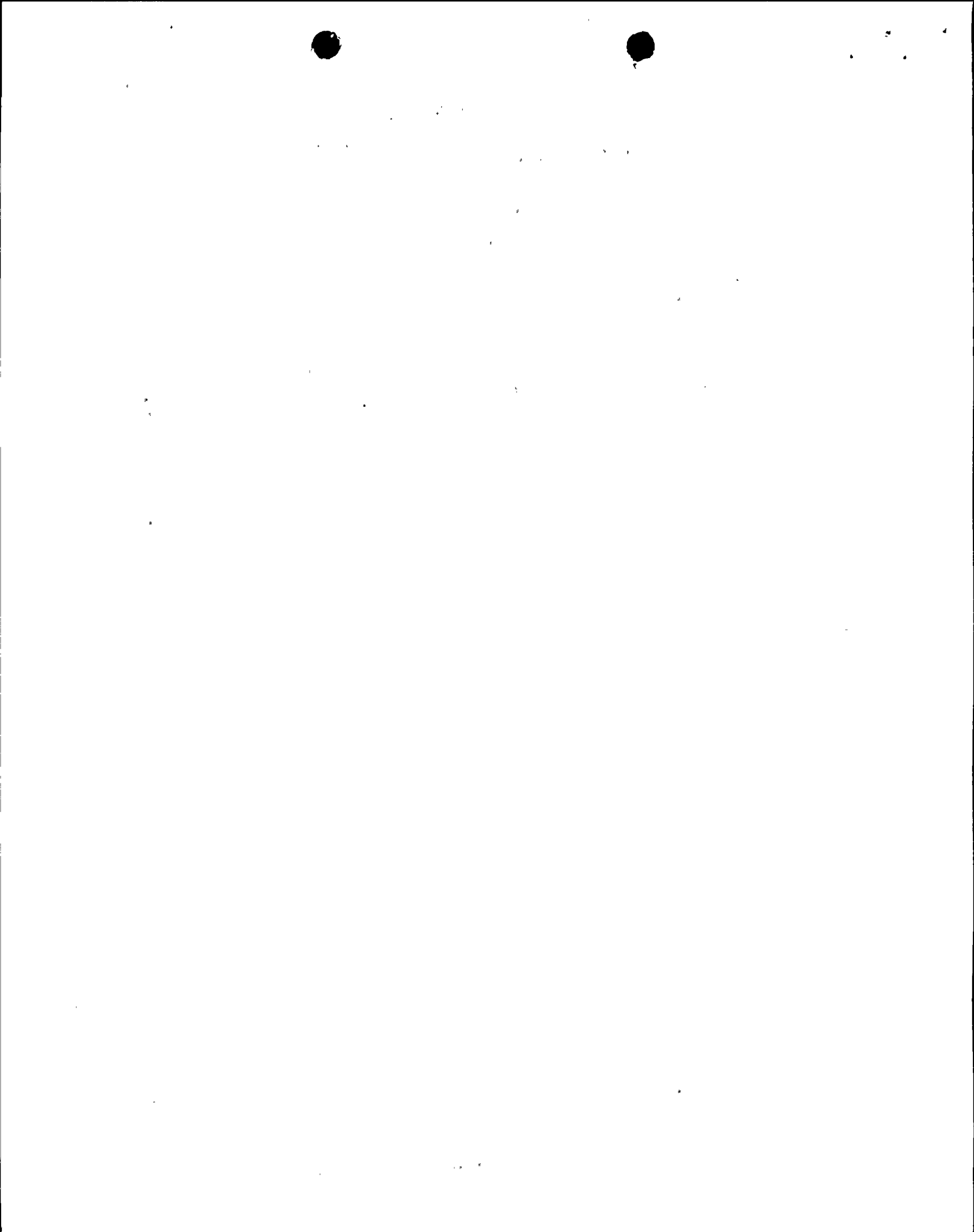
Breaker No.	Description	Affect Cold Shutdown	
		Yes	No
1311	Nis. Chan. III Cab. C Control Power		X
1312	Nis. Chan. III Cab. C Instr. Power		X
1313	Rack Nu. Prot. Set 3 Cub. A		X
1314	Rack Nu. Contr. Set 3 Cub. A		X
1315	Misc. Instr. TIC103-PM17		X
1316	Incore Instr. Whittaker Ref. Jct. Box No. 1		X
1317	Rack Nu. Safeguard Input A		X
1318	Rack Nu. Safeguard Input B		X
1319	Demin. & Make-Up Water Control CC2. Contr. Console Instr. Bus		X
1320	Chem. & Volume Contr. System CNV Main Control Board Instr. Bus		X
1321	Radiation Monitor Rack A RNRMA		X
1322	Fire Alarm Contr. Panel PØFA		X
1323	Main Contr. Board Status Light Channel III		X
1324	Fire Alarm Contr. Panel PØFA		X
1325	Auxiliary FWL2 Instr. HIC70, 71, HØ1		X
1326	Rcp 13 Leakage Press. Instr.		X
1327	RWST Level Auxiliary Relay, PIC		X
1328	Control Room Vent. Isol. Auxiliary Relays PCRB		X
1329	Safeguard Vent. Logic Cabinet PØV2		X
1330	Seismic Instr. Rack RSI		X
1331	Seismic Orthogonal Triggers ENSTSA		X
1332	Hi Level Rad. Mon. Rack RNRMF		X
	Hi Level Rad. Mon. Det. XRE29		X



Class 1-E

Panel 14 Instrument AC Distribution  
Channel IV (Py 14)

<u>Breaker No.</u>	<u>Description</u>	<u>Affect Cold Shutdown</u>	
		<u>Yes</u>	<u>No</u>
1411	Nis. Chan. IV Cab. D Control Power		X
1412	Nis. Chan. IV Cab. D Instr. Power		X
1413	Rack Nu. Prot. Set 4 Cub. A		X
1414	Rack Nu. Contr. Set 4 Cub. A		X
1415	Misc. Instr. TIC149, TIC945 - PM74, PM87		X
1416	Incore Instr. Whittaker Ref. Jct. Box No. 2		X
1417	Rack Nu. Safeguard Input A		X
1418	Rack Nu. Safeguard Input B		X
	Rack Nu. Safeguard Output B		
1419	Demin. & Make-Up Water Control, CC2, Contr. Console Instr. Bus		X
1420	Chem. & Volume Contr. System CNV Main Control Board Instr. Bus		X
1421	Monitor Light Term. Box BTH110		X
1422	Auxiliary Relay Rack 'B' RNARB		X
1423	Rack Nu. Safeguard Test 'B' RNSTB		X
1424	Cont. Board Demux. CNDM		X
1425	Main Control Board Status Light Channel IV		X
1426	Gen. Relay Board (11)		X
1427	Loose Parts Mon. Rack RLPM		X
1428	RCPL4 Leakage Press. Instr.		X
1429	Meteorological Panel & TW PMMET		X
1430	Dedicated Shutdown Panel PDS		X



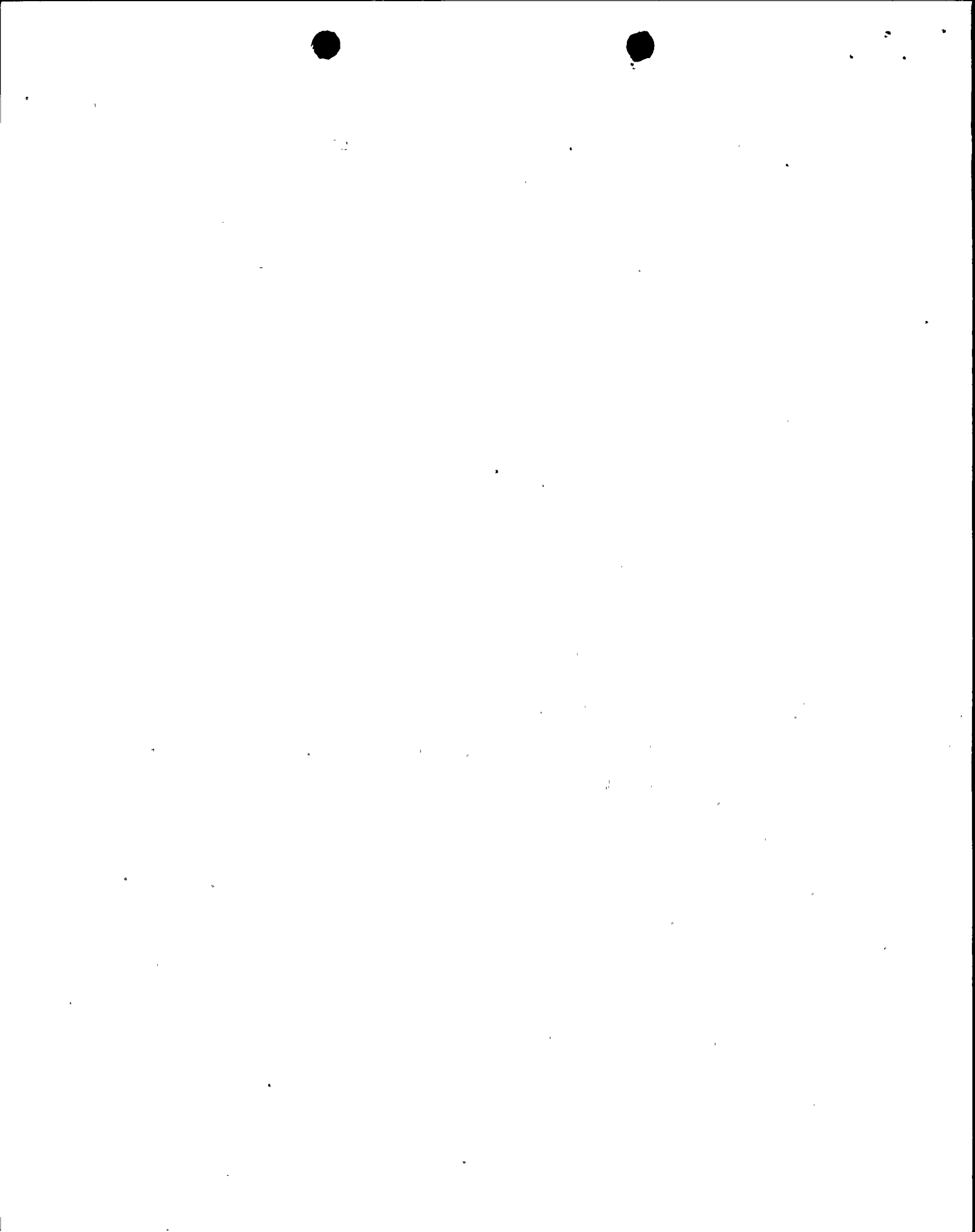


Non-Class 1-E

Panel 15 Instrument AC Distribution

(Py 15)

<u>Breaker No.</u>	<u>Distribution</u>	<u>Affect Cold Shutdown</u>	
		<u>Yes</u>	<u>No</u>
1511	Main Generator Control Board CG (Recorders & Turbine Power Drawers)		X
1512	Instrument Rack RI		X
1513	Sump Pumps Evap. Pnl. PØWE		X
1514	Eng. Safeguard Control Board CHF (Recorders)		X
1515	Miscellaneous Field Instrument (PML18)		X
1516	Station Electric Control Board CH		X
1517	Counting Room #120 Instrumentation		X
1518	Laboratory Room #136		X
1519	Counting Room #120 Instrumentation		X
1520	Laboratory Room #136		X
1521	Turbine Control Board (Recorders) CT1		X
1522	Reheat Steam Valve Control		X
1523	Plant Vent. Rad. & Flow Mon. XRE24 XFT12		X
1524	Main Annunciator Blower PK008		X
1525	Auxiliary Building Control Panel Evap. PØEC		X
1526	Gas Decay Tank Press. Instr. PML55		X
1527	Rack Nuclear Incore Instr. Console (Power Rack #13) RNICB		X
1528	Gross Failed Fuel Det. Rack RNGFFD		X
1529	Turbine Control Board (HC'S) CTI		X
1530	Condensate Feed Water Bypass Control EQCFB		X
1531	Plant Vent. Flow Rec. FRL2, RCRM		X
1532	Main Annunciator PK008		X
1533	Auxiliary Relay Rack B RNARB For Criticality Mon. LTS/Horn		X
1534	Site Emergency Cabinet EACC3 For Contr. Evac.		X
1535	Spare		X



Non-Class 1-E

Panel 16 Instrument AC Distribution  
(Py 16)

Breaker No.	Description	Affect Cold Shutdown	
		Yes	No
1611	CHPS FQ16A FT16, FS16, FQ18, FT18 & FS18		X
1612	Gas Analyzer PØG1		X
1613	Przr, Dead Wt. Tester XPL458B		X
1614	Instrument Rack RI (Cable Spreading Room)		X
1615	Waste Conc. Hold Tank Temp Auxiliary Relay TS38X		X
1616	Boric Acid Evap. & Gas Stripper PØB1		X
1617	Boric Acid Heat Tracing Panel PØNT		X
1618	Radwaste System PØWE		X
1619	Radwaste System Instr. LTL30, 131, 132, 133		X
1620	Spent Fuel Pit LC650, TIC651, Area "J" Elev. 145'-0"		X
1621	Sample Panels PM1 & PM3		X
1622	480V MCC Bus Sec. "L2M" Package Boiler Low Level Auxiliary Relay (RDM Exh. Fans Damper Pos.)		X
1623	Stg. Tank Level Inst. PML85, PML86 El. 100' J		X
1624	Auxiliary Feedwater Turbine Tach. Nr. FCV 152		X
1625	Boron Injection XF1C989, Area "K" El. 73'		X
1626	Cont'mt. Humidity & Temp. Instr. PML99		X
1627	Liquid H.U. Tank Level LS267 Aux. Rel. PML30, XLC68		X
1628	CCW Surge Tank Level LT 116, LT 117		X
1629	CCW PP 11, 12, 13 FS 66, 67, 68		X
1630	Chlorine Monitor Recorder PM199		X
1631	Demin. Control Cabinet PM7 El. 115 'K'		X
1632	Inverter P2000 Computer		X
1633	Boron Concentration Measuring System BJBC, PNBC		X
1634	Blowdown Demin. Control Panel PM203		X
1635	CHP's FQ17, FT17, FS17, FQ19, FT19, FS19		X
1636	S.G. Blowdown Tank Control Panel PM205		X
1637	Gen. Stator Temperature Scanner XTR84		X
1638	Main Stm. Isol. 1 & 2 Pos. Transm. Pot. 41, 42		X
1639	RC Pump Vibration Mon. XYM 498		X
1640	Main Stm. Isol. 3 & 4 Pos. Transm. Pot 43, 44		X

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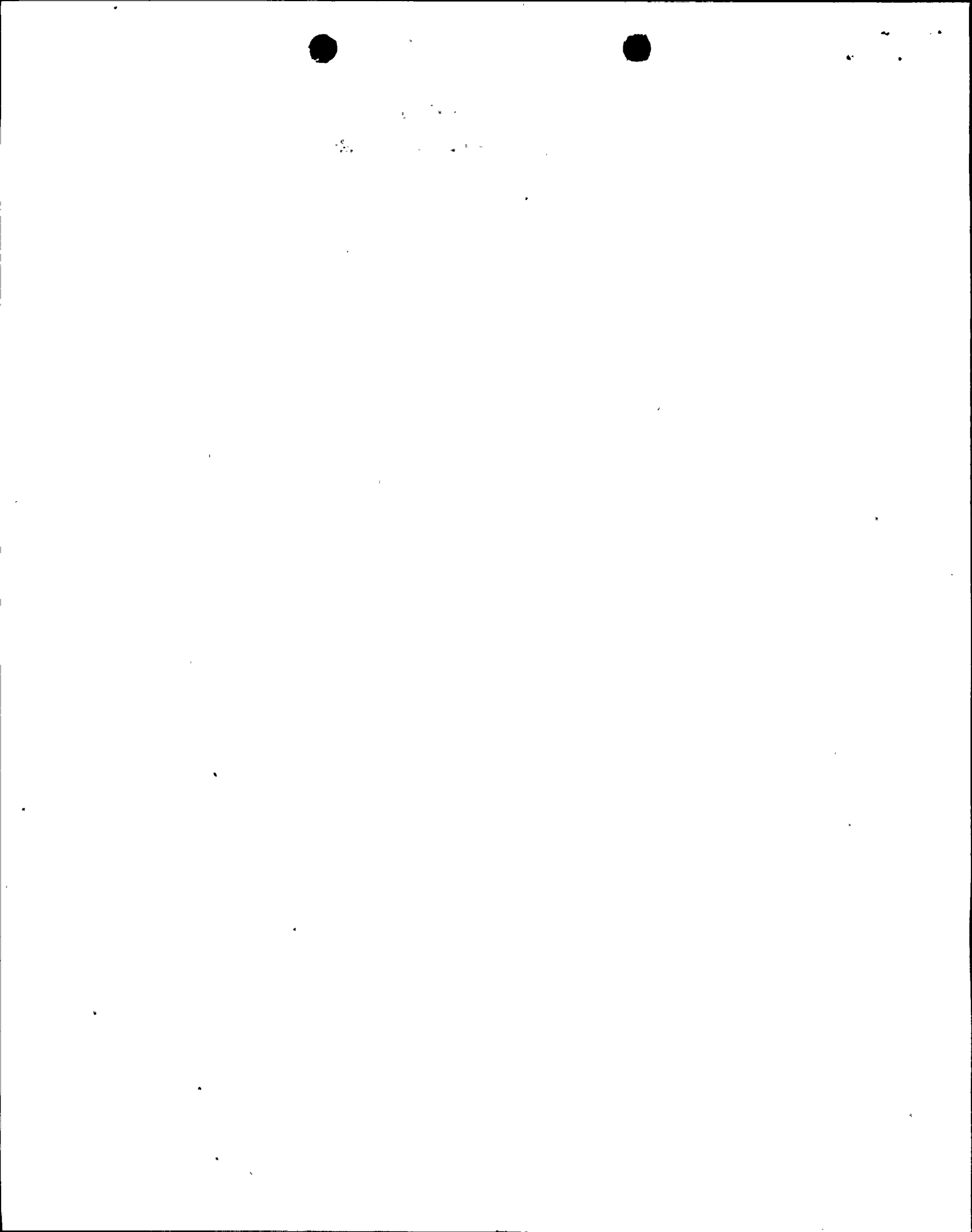
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Non-Class 1-E

Panel 17 Instrument AC Distribution

(Py 17)

Breaker No.	Description	Affect Cold Shutdown	
		Yes	No
1711	Iso-phase Bus Cooler Temp. Modifier		X
1712	XFSSF Cond. Booster Pumps Flow Switch		X
1713	Deluge System BTE400		X
1714	PM92 & PM93 Miscellaneous Mechanical Panels Area "C"		X
1715	Excitation Switchgear 5E1		X
1716	Generator Auxiliary Panel PGA, H <sub>2</sub> Seal Oil Sup. Cont. PG's Stator End Iron Scan XT/S11		X
1717	Plant Air Dryer Outlet PM150		X
1718	Cond. Hotwell NW Stand Pipe (LT6, LT24, LT47)		X
1719	Feed Water Pump #12 CTFW12 Local Control Console		X
1720	Circulating Water Pumps 1 & 2 Flow Trans- ducer XFT108 & XFT109		X
1721	Sample Panel #6 PM6		X
1722	Steam Dump Temp. Scan XTI510		X
1723	Local Turbine Gen. Panel PM40A		X
1724	Generator Temp. Scanner Cabinet EQGTS		X
1725	Vacuum Pump PM42		X
1726	Main Turbine Turning Gear Autostart BTB504		X
1727	Feed Water Pump #11 CTFW11 Local Control Console		X
1728	Main Turbine Test Valves BTD403		X
1729	Generator Cond. Monitor EQGCM		X
1730	Serv. Clg. Water Pump Local Control Station P0SCW		X
1731	Turbine Bldg. Sump Pum PML92		X
1732	Cardox System BTE401		X
1733	Cond. Leak Detect System Mechanical Panel PM61		X
1734	Discharge Circulating Water Temp. XTM69		X
1735	Flow Power Supply For MSR HTG System Inlet XFQ20		X
1736	Main Transf. Fault-Gas Mon. TQMA (750 MA)		X



Non-Class 1-E

Panel 18 Instrument AC Distribution

(Py 18)

<u>Breaker</u> <u>No.</u>	<u>Distribution</u>	<u>Affect Cold Shutdown</u>	
		<u>Yes</u>	<u>No</u>
1811	5 Path Rotary Incore Instr. Drive H(A)		X
1812	10 Path Rotary Incore Instr. Drive 11(A)		X
1813	10 Path Rotary Incore Instr. Drive 12(B)		X
1814	10 Path Rotary Incore Instr. Drive 12(B)		X
1815	10 Path Rotary Incore Instr. Drive 13(C)		X
1816	10 Path Rotary Incore Instr. Drive 13(C)		X
1817	10 Path Rotary Incore Instr. Drive 14(D)		X
1818	10 Path Rotary Incore Instr. Drive 14(D)		X
1819	10 Path Rotary Incore Instr. Drive 15(E)		X
1820	10 Path Rotary Incore Instr. Drive 15(E)		X
1821	10 Path Rotary Incore Instr. Drive 16(F)		X
1822	10 Path Rotary Incore Instr. Drive 16(F)		X
1823	BTXA1 For Drive Assem. 11(A)		X
1824	BTXB1 For Drive Assem. 12(B)		X
1825	BTXC1 For Drive Assem. 13(C)		X
1826	BTXD1 For Drive Assem. 14(D)		X
1827	BTXE1 For Drive Assem. 15(E)		X
1828	BTXF1 For Drive Assem. 16(F)		X
1829	FLC176 RCP 11 Seal Bypass		X
1830	FLC172 RCP 12 Seal Bypass		X
1831	FLC171 RCP 13 Seal Bypass		X
1832	FLC166 RCP 17 Seal Bypass		X
1833	Valve Leakage Lt. Box EQWBL		X

