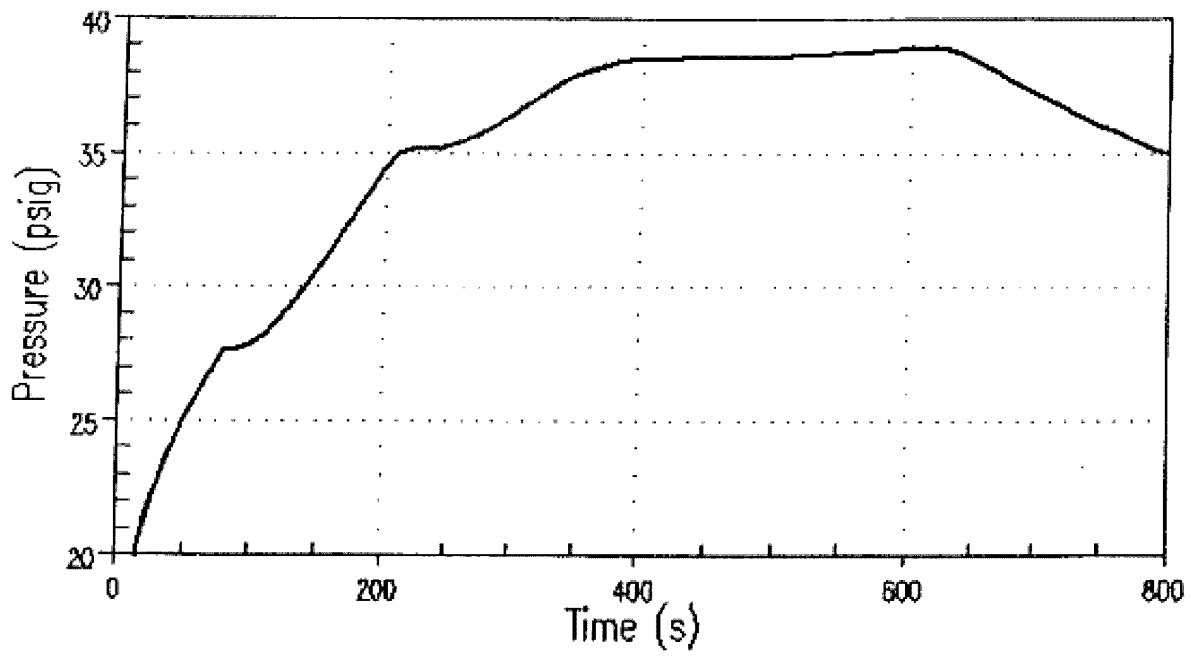


**Comanche Peak  
Final Safety Analysis Report  
Units 1 and 2**

**Containment Atmosphere  
Temperature Transient  
4.3 ft<sup>2</sup> Split SLB**

**Figure 6.2.1-3**

Amendment No. 103



<b>Comanche Peak Final Safety Analysis Report Units 1 and 2</b>
<b>Containment Pressure Transient 4.7 ft<sup>2</sup> Split SLB</b>
<b>Figure 6.2.1-4</b>

CPSSES/FSAR  
FIGURE 6.2.1-5

THIS FIGURE HAS BEEN DELETED

| 69

CPSSES/FSAR  
FIGURE 6.2.1-6

THIS FIGURE HAS BEEN DELETED

| 69



CPSSES/FSAR  
FIGURE 6.2.1-7

THIS FIGURE HAS BEEN DELETED

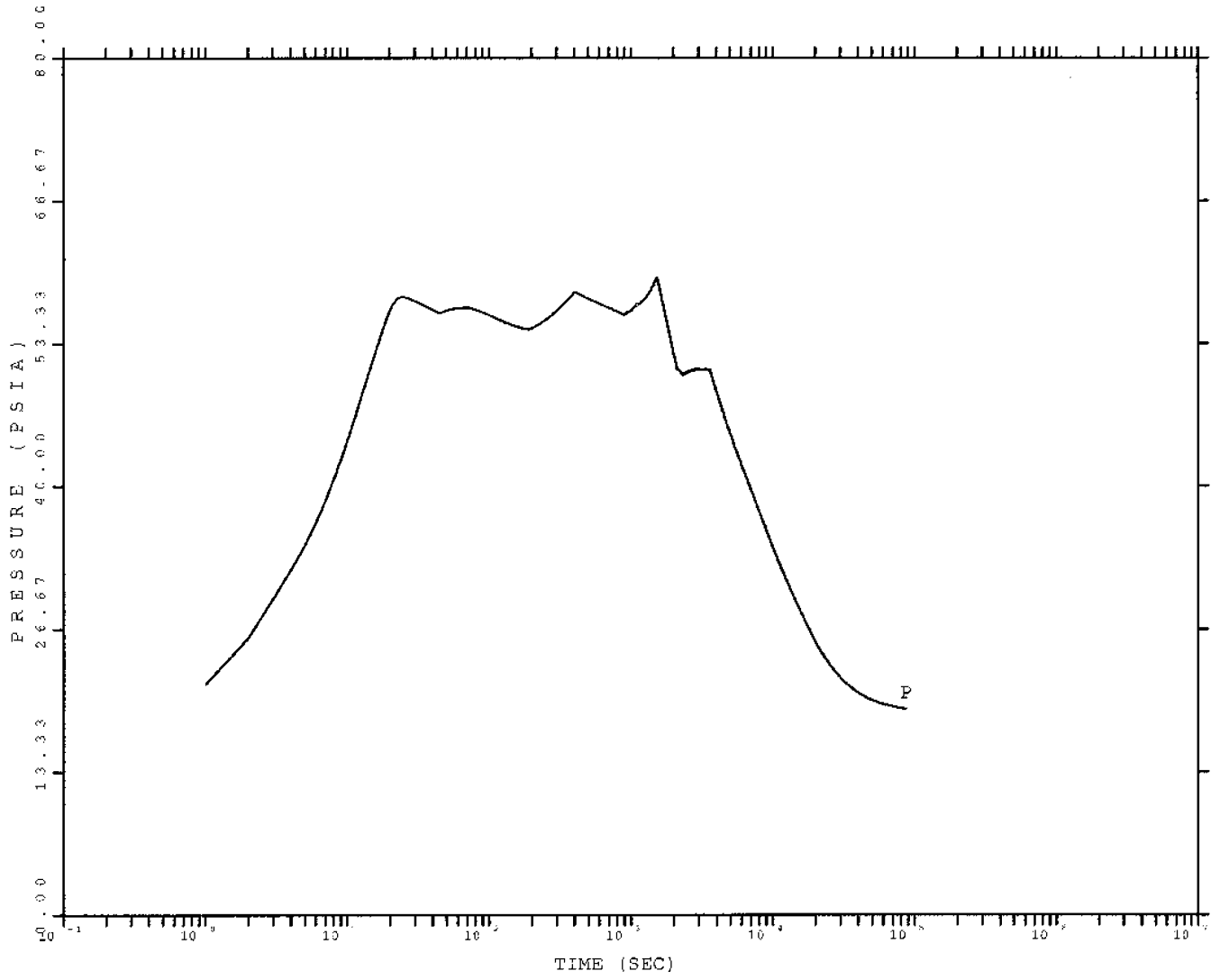
| 69

CPSES/FSAR  
FIGURE 6.2.1-8

THIS FIGURE HAS BEEN DELETED

| 69

CONTENMP-ED/918 + DU PARGON/C/REF MOLE (INTEGRATED CT, ECCS, CCM, & SCS SYSTEMS) - CONTE22, VER DJONUSA  
CPI RSG DEPSG LOCA MIN ECCS-MIN CT-(Ref 2 MINSI8 + Ref 6 Case 2)

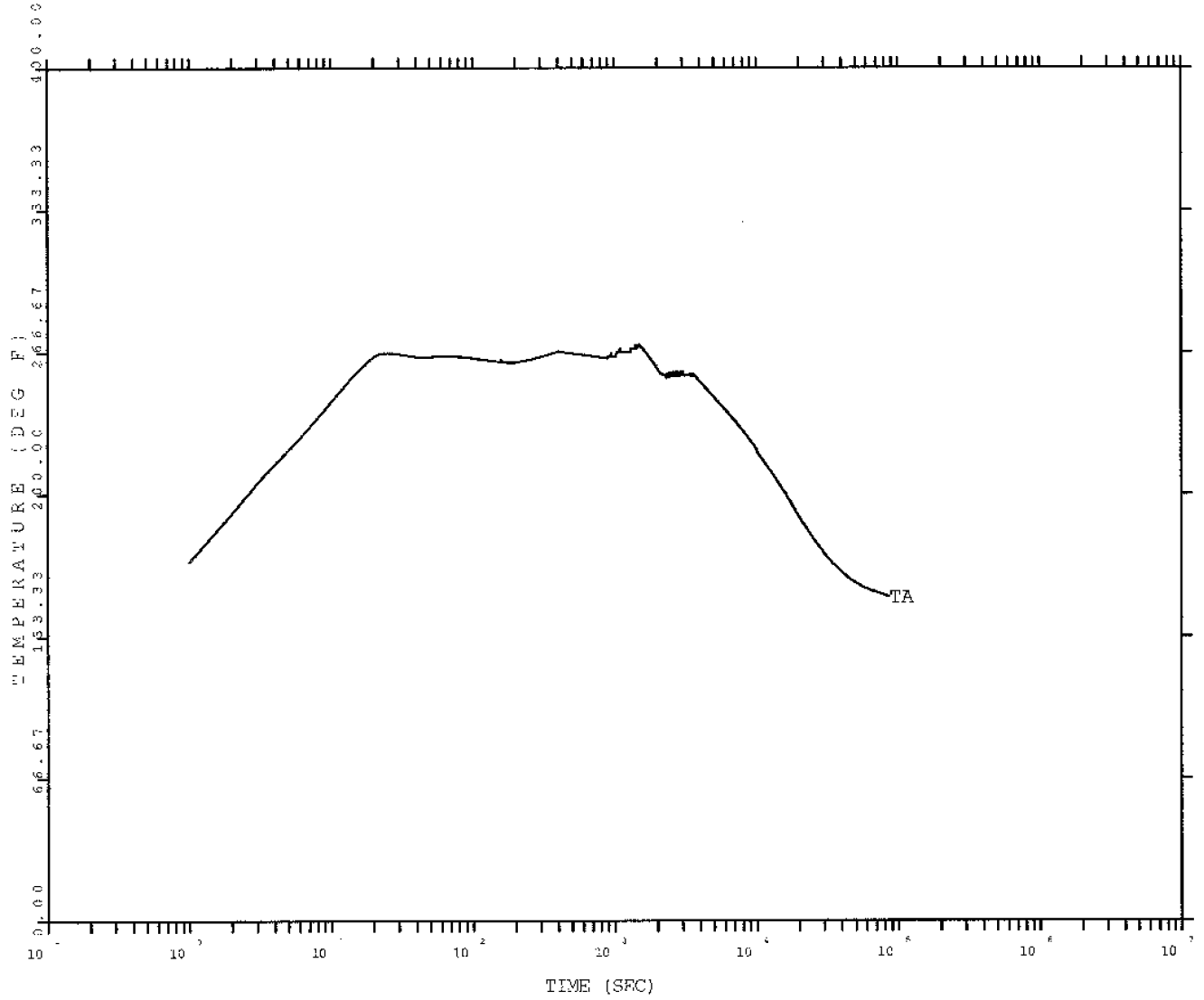


### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE PRESSURE TRANSIENT UNIT 1 - LOCA
FIGURE 6.2.1-9

CONTINUED FROM + 10 MINUTE PLOT INTEGRATED CT, ECCS, CDB, & SSI (REF 2) - CONTINUED PER SOURCE

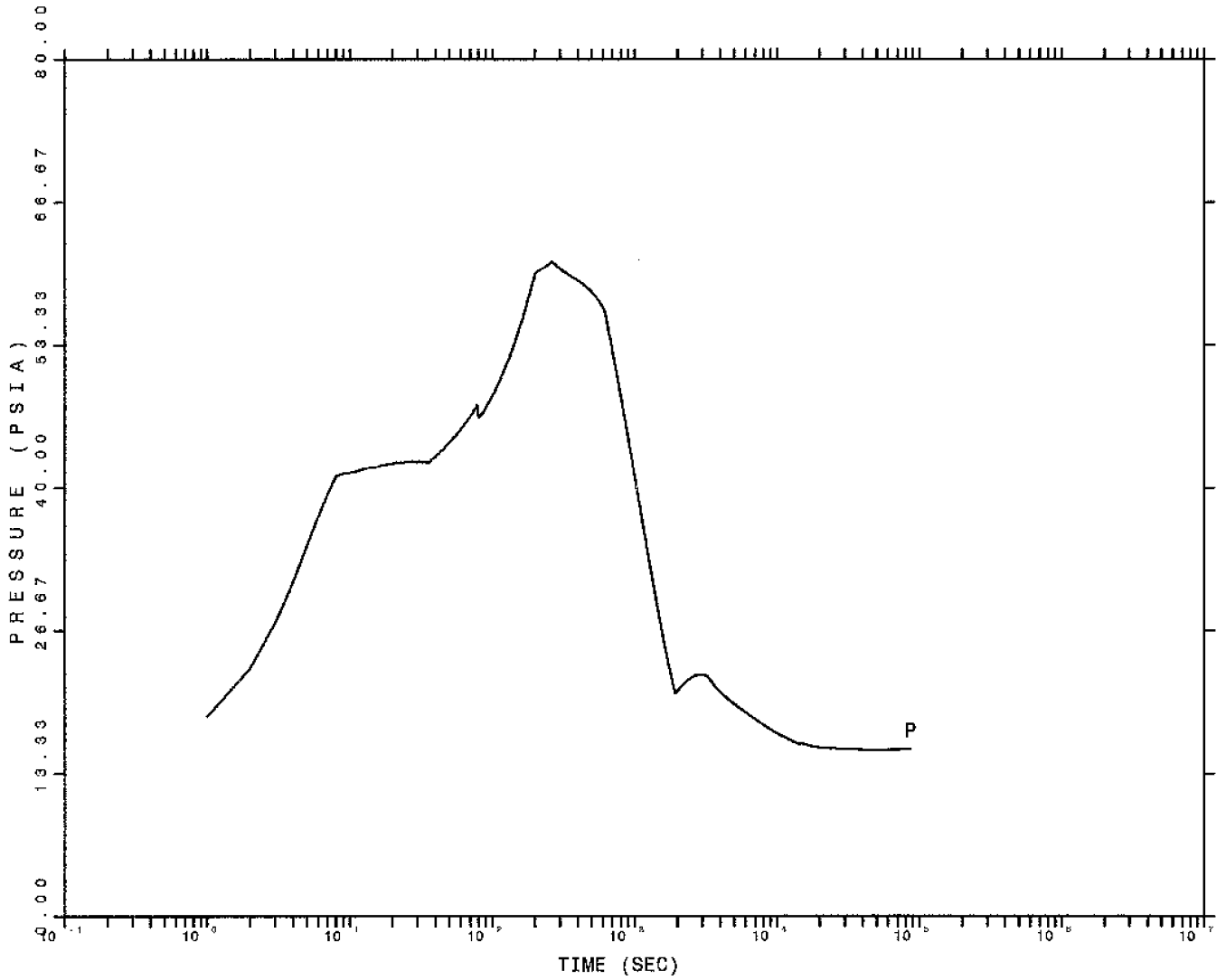
CP1 RSG DEPSG LOCA MIN ECCS-MIN CT-(Ref 2 MINST8 + Ref 6 Case 2)



### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE TEMPERATURE TRANSIENT UNIT 1 - LOCA
FIGURE 6.2.1-10

CONTEMPT-LT/028 + TU ELECTRIC/RXG MODES (INTEGRATED CT, EDCS, DCW, & SSI SYSTEMS) - CONTEMPT, VED EJUNW3A  
CONTEMPT-LT/028\_TU CP-1 RSG MSLB, 30% POWER, 1.4 FT\*\*2 DER

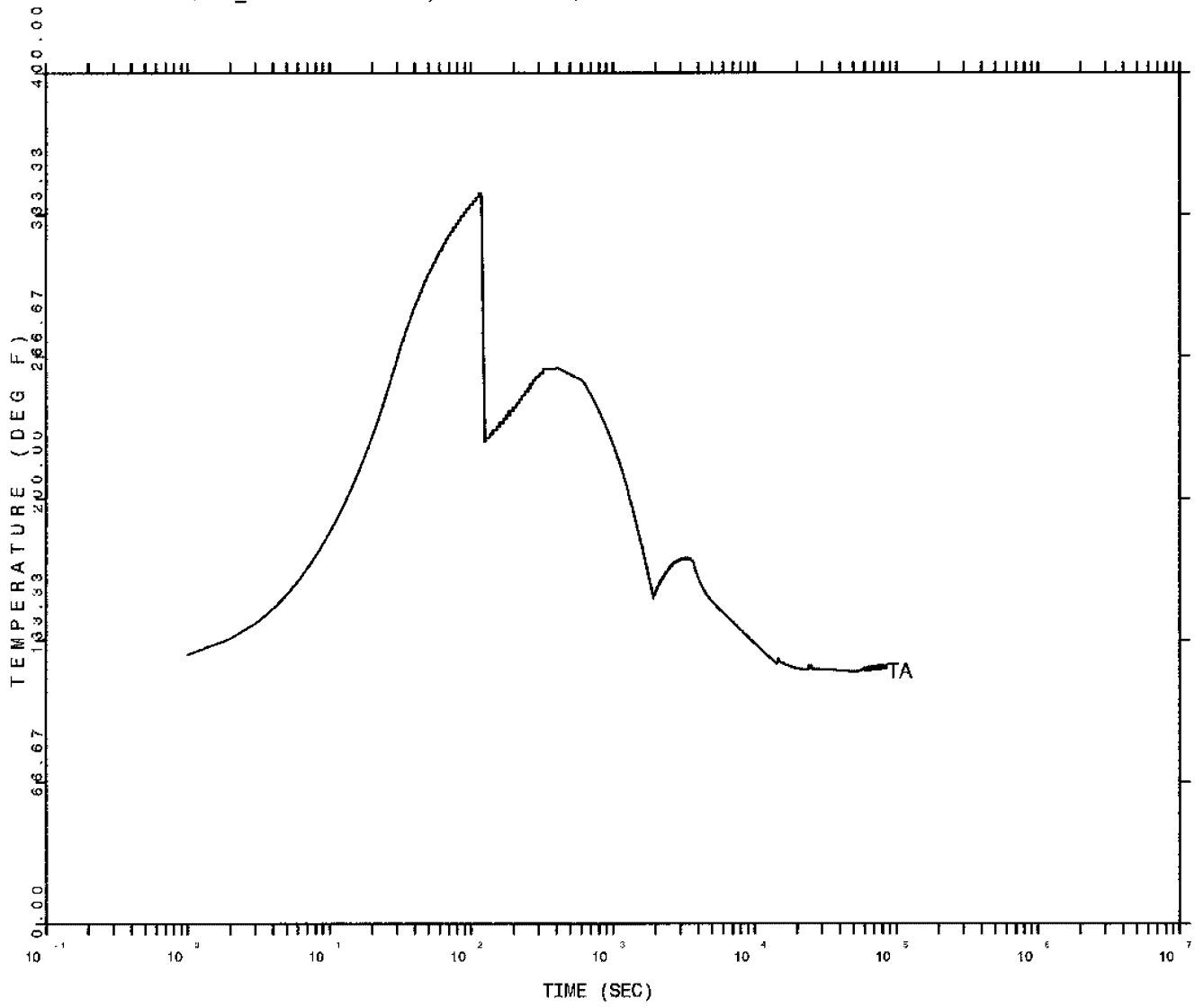


### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE PRESSURE TRANSIENT UNIT 1 - MSLB
FIGURE 6.2.1-11

CONTEMPT-LT/028 - TU ELECTRIC/EXE MDS (INTEGRATED CT, EOCs, CCW, & SST SYSTEMS) - CONT002, VER 01/09/99A

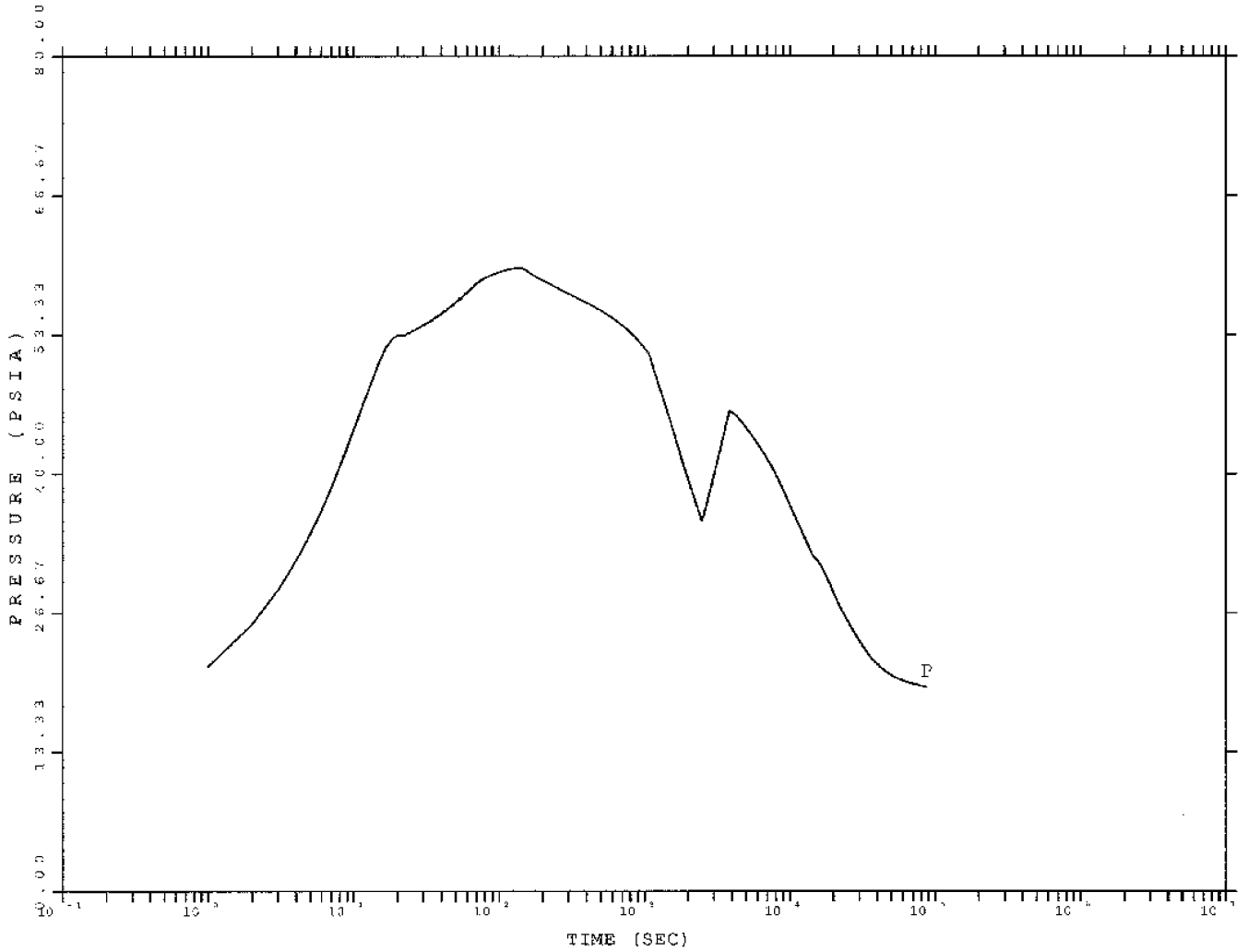
CONTEMPT-LT/028\_TU CP-1 RSG MSLB, 100.6% POWER, 0.916 FT\*\*2 SPLIT



### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE TEMPERATURE TRANSIENT UNIT 1 - MSLB
FIGURE 6.2.1-12

CONTINUM.../C20 - TO.../R&E MODS (INTEGRATED ST, DOCS, OCR, & SST SYSTEMS) - CONTROL, VER. B31093A  
CONTENPT-LT/028\_TU - CP1&2 DEPSG LOCA - MIN(ECCS & CSS) - 3650

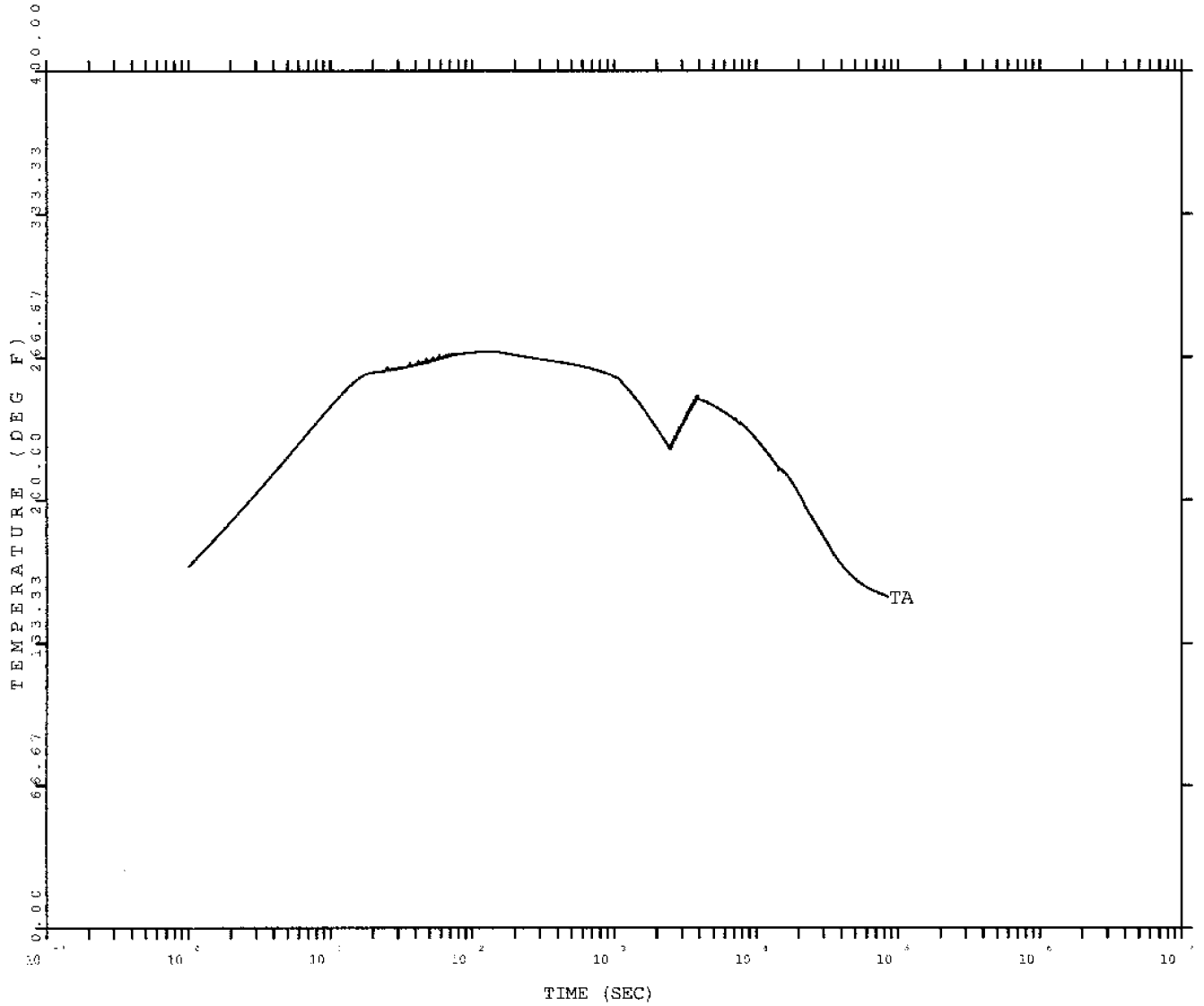


### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE PRESSURE TRANSIENT UNIT 2 - LOCA
FIGURE 6.2.1-13

COMNTRM-FR/C20 + TU BLENDING/FAE XDCS (INTEGRATED CI, ECCS, CSS, & SSI SYSTEMS) - CONTEK2, VER 04/09/04

CONTEMPT-LT/028\_TU - CP1&2 DEPSG LOCA - MIN(ECCS & CSS) - 3650



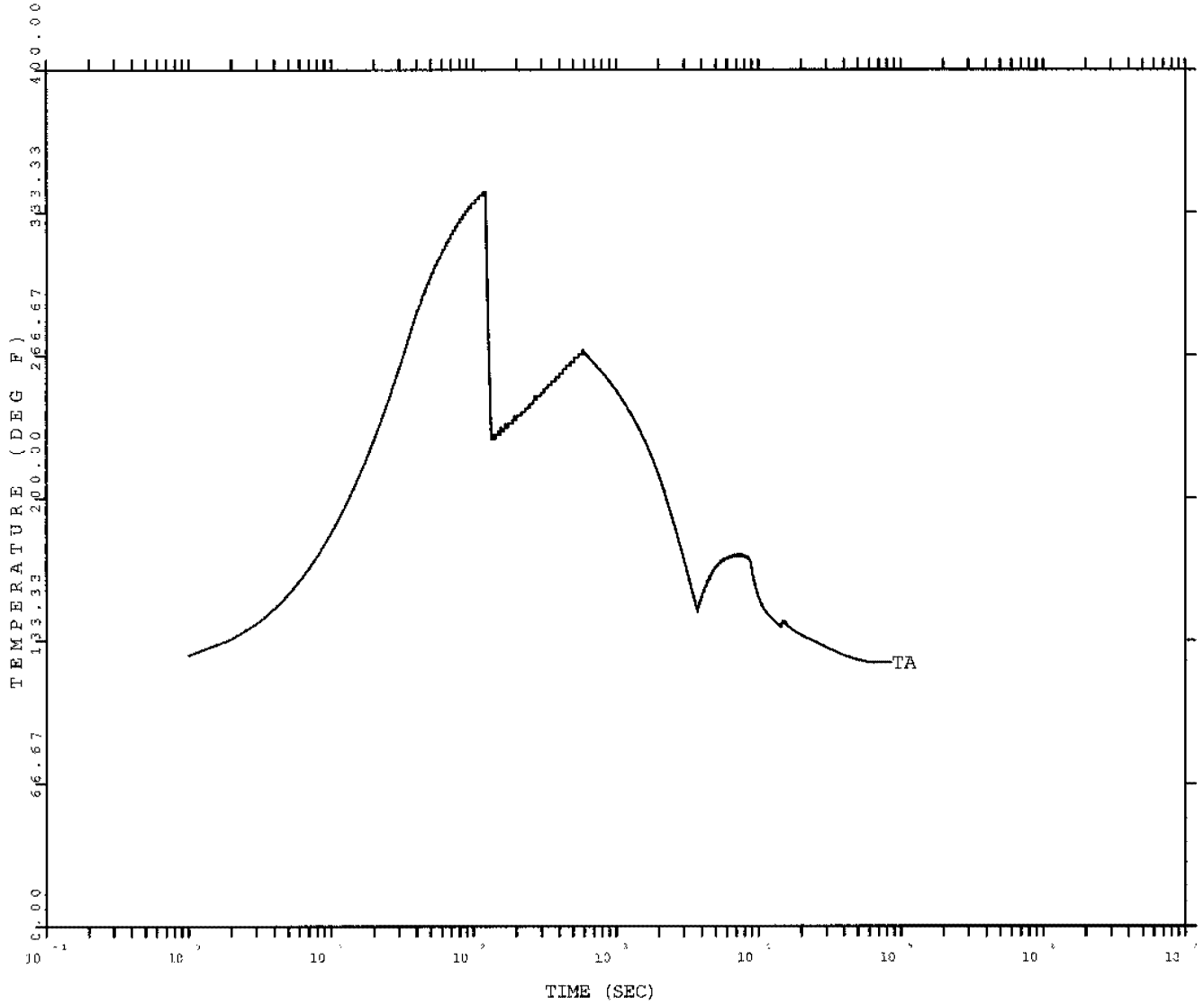
### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE TEMPERATURE TRANSIENT UNIT 2 - LOCA
FIGURE 6.2.1-14



CONTINUED FROM + TO K:\MTR\102\446 PAGES (INTEGRATED CT, ECCS, GCR, & SSI SYSTEMS) - CONTING. VER K:\MTR\102

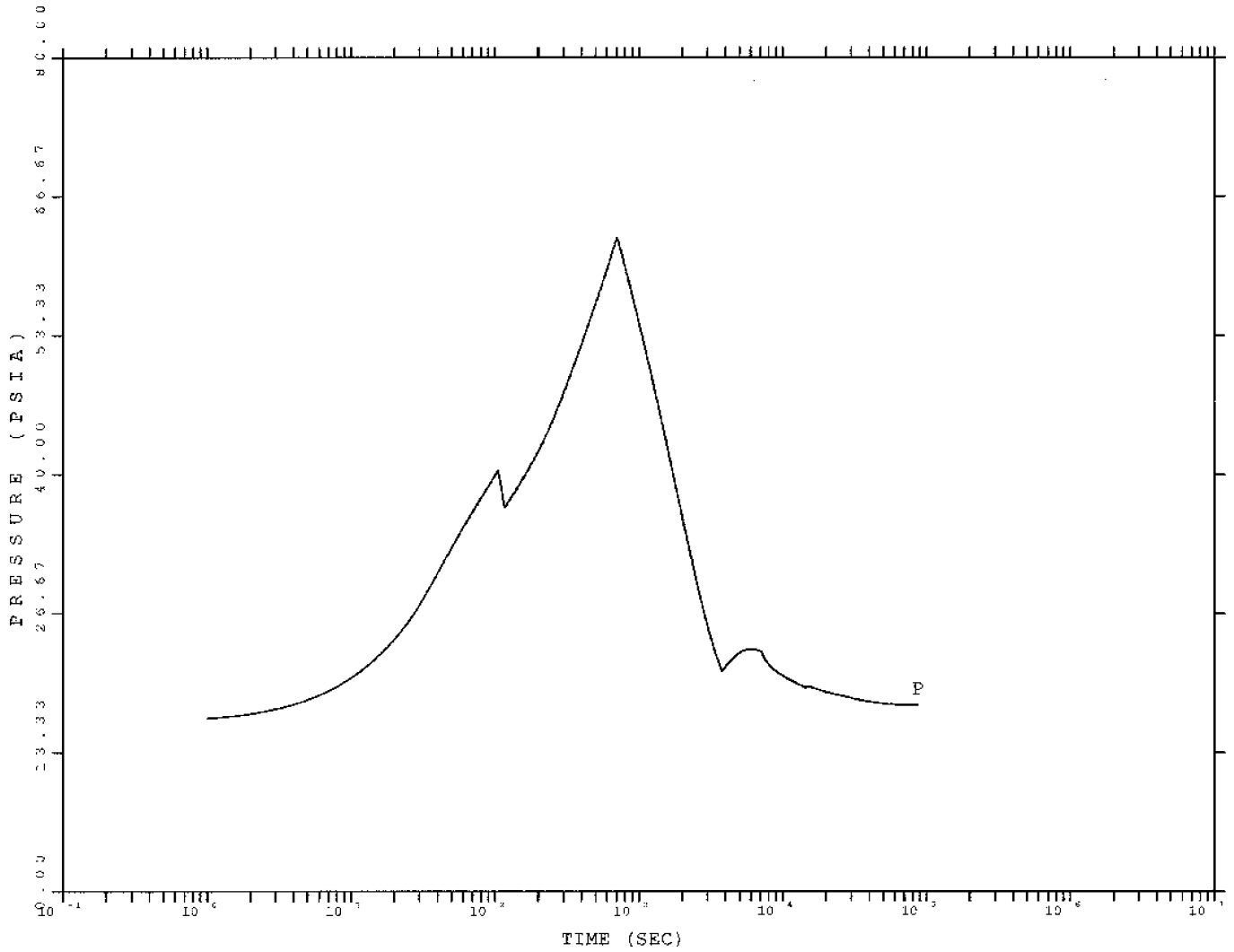
CONTEMPT-LT/028\_TU CP1&2 MSLB, 70% POWER-0.908 FT\*2 SPLIT-NO MSIV



### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE PRESSURE TRANSIENT UNIT 2 - MSLB
FIGURE 6.2.1-15

CONTEMPT-LT/028\_TU CP1&2 MSLB, 30% POWER-0.942 FT\*2 SPLIT-NO MSIV



### Amendment 102

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ATMOSPHERE TEMPERATURE TRANSIENT UNIT 2 - MSLB
FIGURE 6.2.1-16

CPSSES/FSAR  
FIGURE 6.2.1-16A

THIS FIGURE HAS BEEN DELETED

| 69

FIGURE 6.2.1-17

93 |

HAS BEEN DELETED

CPSSES/FSAR  
FIGURE 6.2.1-18

THIS FIGURE HAS BEEN DELETED

| 69

CPSSES/FSAR  
FIGURE 6.2.1-19

THIS FIGURE HAS BEEN DELETED

| 69

CPSES/FSAR

FIGURE 6.2.1-20  
THIS FIGURE HAS BEEN DELETED

CPSSES/FSAR

FIGURE 6.2.1-21

HAS BEEN DELETED

78



CPSES/FSAR

FIGURE 6.2.1-22

HAS BEEN DELETED

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CPSSES/FSAR

FIGURE 6.2.1-23

HAS BEEN DELETED

78

CPSSES/FSAR

FIGURE 6.2.1-24  
HAS BEEN DELETED

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CPSSES/FSAR

FIGURE 6.2.1-25  
HAS BEEN DELETED

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CPSES/FSAR

FIGURE 6.2.1-26  
HAS BEEN DELETED

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CPSES/FSAR

FIGURE 6.2.1-27  
HAS BEEN DELETED

78

CPSSES/FSAR

FIGURE 6.2.1-28  
HAS BEEN DELETED

|

78

CPSSES/FSAR

FIGURE 6.2.1-29  
HAS BEEN DELETED

|  
78



CPSES/FSAR

FIGURE 6.2.1-30  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-31  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-32  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-33  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-34  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-35  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-36  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-37  
THIS FIGURE HAS BEEN DELETED



CPSES/FSAR

FIGURE 6.2.1-38  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-39  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-40  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-41  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-42  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-43  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-44  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-45  
THIS FIGURE HAS BEEN DELETED



This figure was deleted  
in Amendment 6

AMENDMENT 10  
MARCH 31, 1980

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
FIGURE 6.2.1-46

This figure was deleted  
in Amendment 6

AMENDMENT 10  
MARCH 31, 1980

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

FIGURE 6.2.1-47

This figure was deleted  
in Amendment 6

AMENDMENT 10  
MARCH 31, 1980

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

FIGURE 6.2.1-48

CPSES/FSAR

FIGURE 6.2.1-49  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-50  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-51  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-52  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-53

HAS BEEN DELETED

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CPSES/FSAR

FIGURE 6.2.1-54  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-55  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-56  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-57

HAS BEEN DELETED

78

CPSES/FSAR

FIGURE 6.2.1-58  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-59  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-60  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-61  
THIS FIGURE HAS BEEN DELETED



CPSES/FSAR

FIGURE 6.2.1-62  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-63  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-64  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-65  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-66  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-67  
THIS FIGURE HAS BEEN DELETED

CPSES/FSAR

FIGURE 6.2.1-68  
THIS FIGURE HAS BEEN DELETED

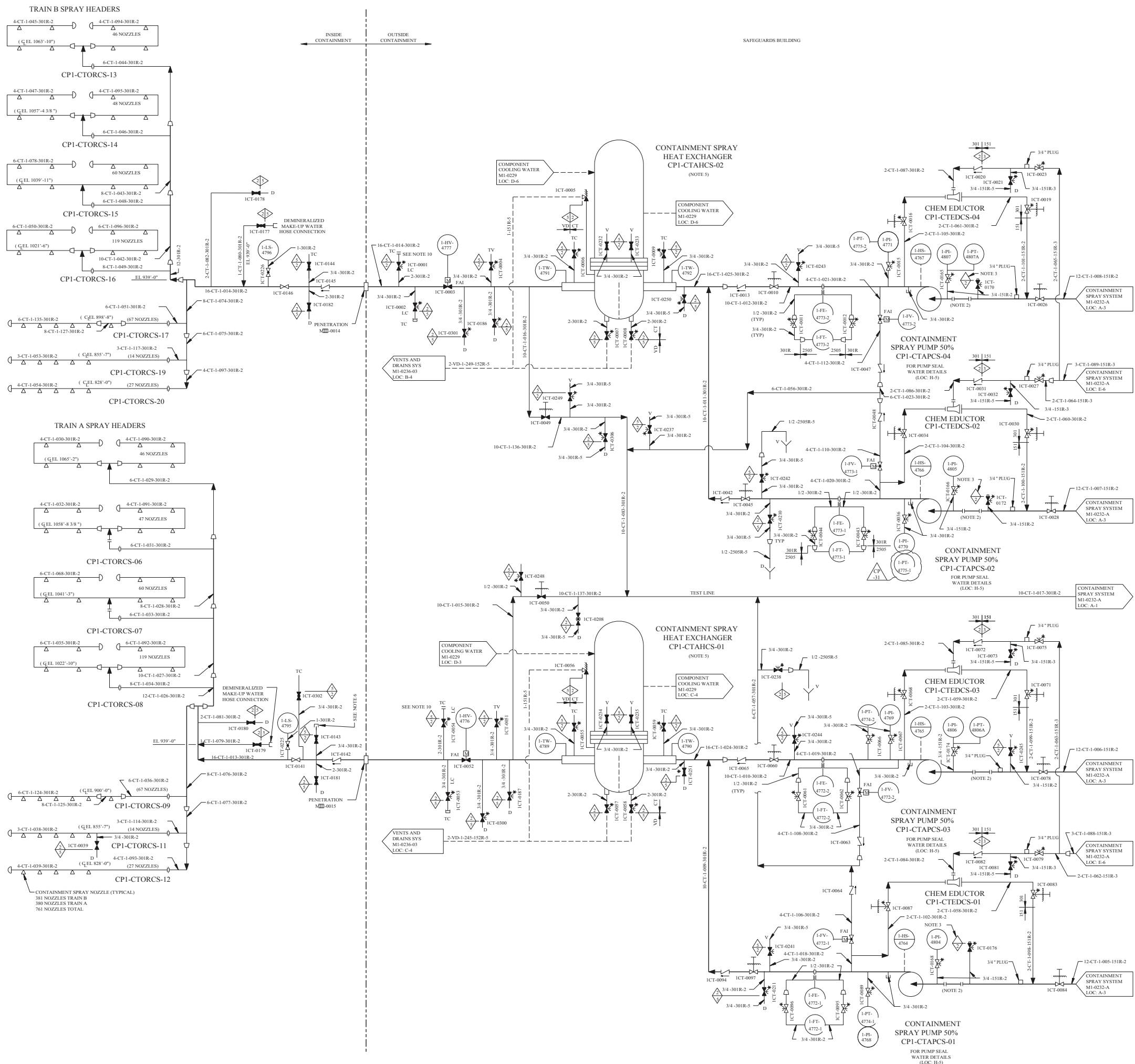
CPSES/FSAR

FIGURE 6.2.1-69  
THIS FIGURE HAS BEEN DELETED



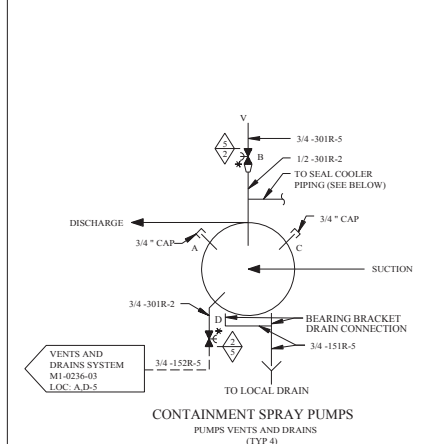
CPSES/FSAR

FIGURE 6.2.1-70  
THIS FIGURE HAS BEEN DELETED

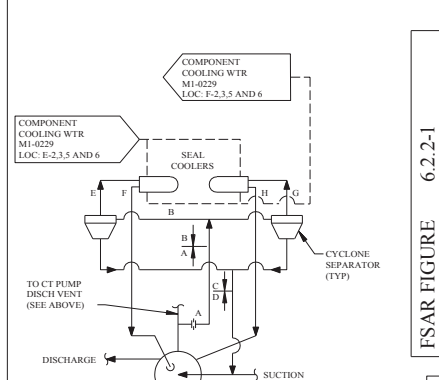


REV	DATE	CHKD	APPD	REMARKS
CP-31	12/26/2011			THIS DRAWING REVISED TO EDITORIALY CORRECT DRAFTING ERROR THAT OCCURRED JUNE 6, 1996 WHEN CP-21 OF THIS DRAWING WAS REVISED AND ISSUED. THIS CHANGE WILL BE IN AGREEMENT WITH DESIGN DOCUMENTS BRP-CT-3800 REV C-2, PCA-2036 REV 1 AND PCA-2036 REV 1 PER AICR-2011-000177-1.

- NOTES:
- FOR DEFINITION OF SYMBOLS SEE DRAWING M1-0200
  - TEMPORARY STRAINERS CPI-CTSRIS-01, 02, 03, 04 ARE INSTALLED IN SPOOL PIECES DURING INITIAL FLUSHING OPERATIONS ONLY AND MUST BE REMOVED PRIOR TO PLANT START UP. THE TEMPORARY STRAINERS CAN BE RE-INSTALLED FOR POST MAINTENANCE ACTIVITY.
  - SWAGelok 3/4 x 3/8 OD TUBE CONNECTOR WITH PLUG BY INST.
  - DELETED
  - ALL CONNECTIONS TO THE SHELL SIDE OF THE CS HEAT EXCHANGER ARE SHOWN ON THE COMPONENT COOLING WATER SYSTEM FLOW DIAGRAM DWG M1-0229-01.
  - VALVE ICT-0143 IS TO BE ABANDONED AND THREADED CAP IS TO BE SEAL WELDED.
  - DELETED
  - DELETED
  - UNLESS OTHERWISE NOTED DRAINS COLLECTED BY LOCAL DRAIN SYSTEM.
  - BLIND FLANGES FOR VALVES ICT-0001 AND ICT-0054 ARE INSTRUMENTALLY CONTROLLED IN MODES 1-4, IN LIEU OF LOCAL LEAK RATE TESTING. (SEE NOTE 27, M1-0200)



PUMP	A (SUCTION)	B (DISCHARGE)	C (SUCTION)	D (DRAIN)
CPI-CTAPCS-01	-	ICT-0192	-	ICT-0086
CPI-CTAPCS-02	-	ICT-0193	-	ICT-0035
CPI-CTAPCS-03	-	ICT-0194	-	ICT-0069
CPI-CTAPCS-04	-	ICT-0195	-	ICT-0017



PUMP NUMBER	VALVE NUMBER	XXX FOR LINE NUMBERS							
		A	B	C	D	E	F	G	H
CPI-CTAPCS-01	ICT-0192	908	909	910	911	912	913	914	915
CPI-CTAPCS-02	ICT-0193	916	917	918	919	920	921	922	923
CPI-CTAPCS-03	ICT-0194	924	925	926	927	928	929	930	931
CPI-CTAPCS-04	ICT-0195	932	933	934	935	936	937	938	939

LINE NUMBERS ARE 1/2-CT-1-XXX-1501R-2

DRAWING 2123-M1-0232  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

M1-0232	REV CP-7
M1-0232-A	

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS I SEISMIC CATEGORY I  
 SAFETY CLASS I SAFETY CLASS I  
 SAFETY CLASS I ASSOCIATED CIRCUITS

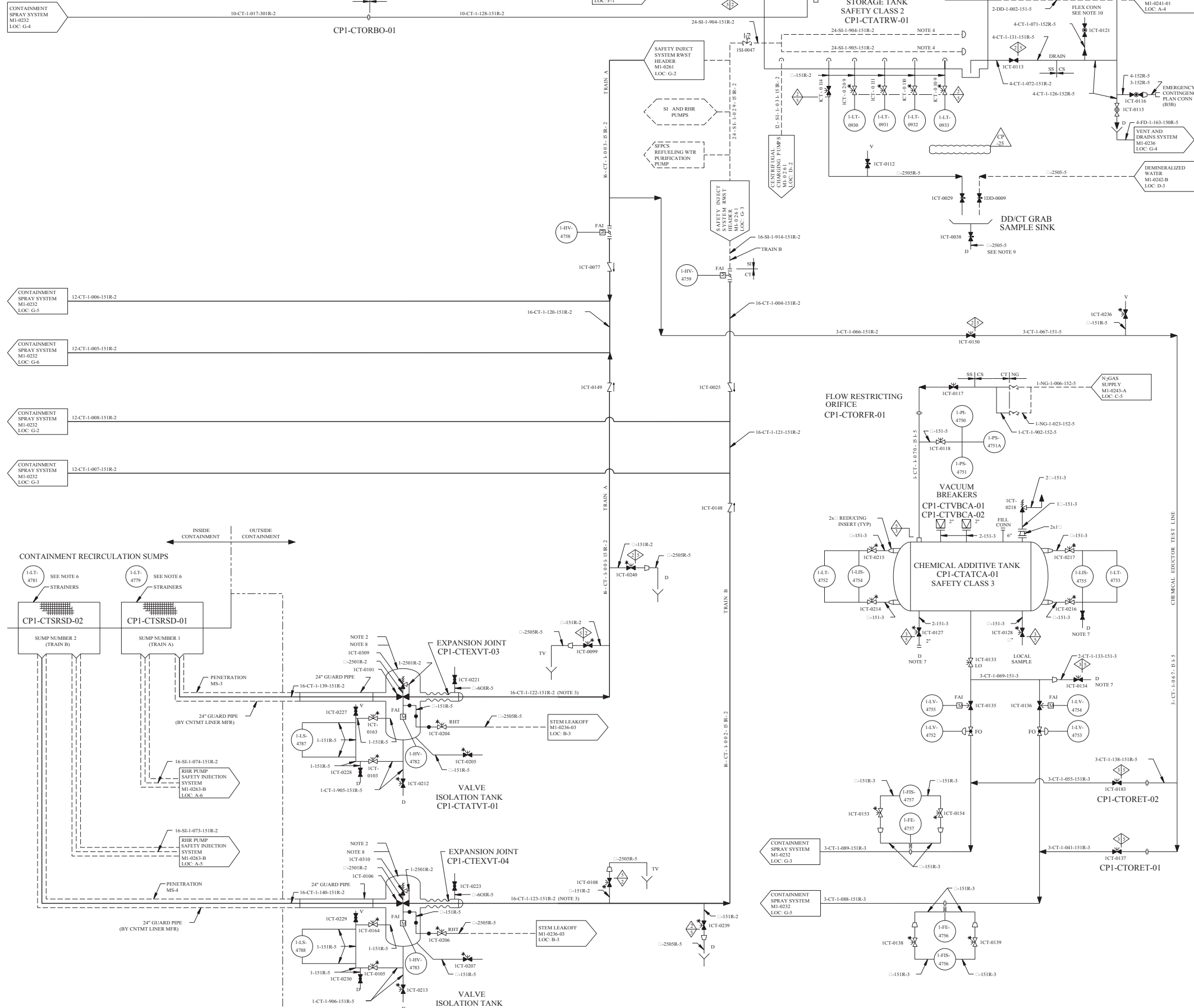
**LUMINANT**  
 CPNPP  
 GLEN ROSE, TEXAS

**FLOW DIAGRAM**  
 CONTAINMENT SPRAY SYSTEM

FSAR FIGURE 6.2.2-1

THIS DRAWING CREATED ELECTRONICALLY

SAFEGUARDS BUILDING



REV	CHKD	APPV	REMARKS
79-21	SKK	204	THIS DRAWING REVISED TO INCORPORATE ALCR-204-01102-1 TO EDITORIALY REMOVE FLOATING LINE NUMBER (EXTRA) CT-1-126 (LOC 1-2)

- NOTES:
- FOR DEFINITION OF SYMBOLS SEE DWG M1-0200
  - VALVE ISOLATION TANK, EXPANSION JOINT, GUARD PIPE, VENT, DRAIN, VALVE STEM LEAK-OFF PIPING AND RELATED VALVES WERE FABRICATED, TESTED AND INSTALLED TO ANSI SAFETY CLASS 2, ASME CODE CLASS 2 REQUIREMENTS. THESE COMPONENTS AND PIPING HAVE BEEN RECLASSIFIED IN THEIR CURRENT APPLICATION TO NON-NUCLEAR SAFETY (NNS) SEISMIC CATEGORY II (FOR STRUCTURAL INTEGRITY AND ENHANCED LEAK DETECTION). THE ASME CODE CLASSIFICATION NEED NOT BE MAINTAINED AND THEREFORE, WORK NEED NOT BE PERFORMED TO ASME XI REQUIREMENTS.
  - PIPING TO BE 16" SCH 120 OR 140 SEAML. ESS SA 376, TP 304 OR TP 316. FITTINGS TO BE 16" SCH 120 SEAML. ESS SA 403, TP 304 OR TP 316.
  - ANTI-VORTEX PIPE.
  - LINE TO TERMINATE ABOVE MAXIMUM WATER LEVEL.
  - WALL MOUNTED LEVEL TRANSMITTER ASSEMBLIES.
  - FLUID COLLECTED FROM DRAINS AND VENTS OFF THE CHEMICAL ADDITIVE TANK SHALL BE DISPOSED OF IN AN APPROPRIATE MANNER BY CHEMISTRY.
  - VALVE ISOLATION TANK MANWAYS PROVIDE AN OPEN VENT PATH THRU THE OPEN MANWAY.
  - SAMPLE SINK DRAIN COLLECTED IN A CONTAINER AND TRANSPORTED TO A DRAIN CAPABLE OF ACCEPTING RADIOACTIVE FLUIDS.
  - FLEX CONNECTION - MAY BE A PIPE CAP OR STORZ FITTING.

DRAWING	2323-M1-0232	REV	CP-7
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
M1-0232			
M1-0232-A			

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1 SEISMIC CATEGORY I  
 SAFETY CLASS 2 CLASS I/E  
 SAFETY CLASS 3 ASSOCIATED CIRCUITS

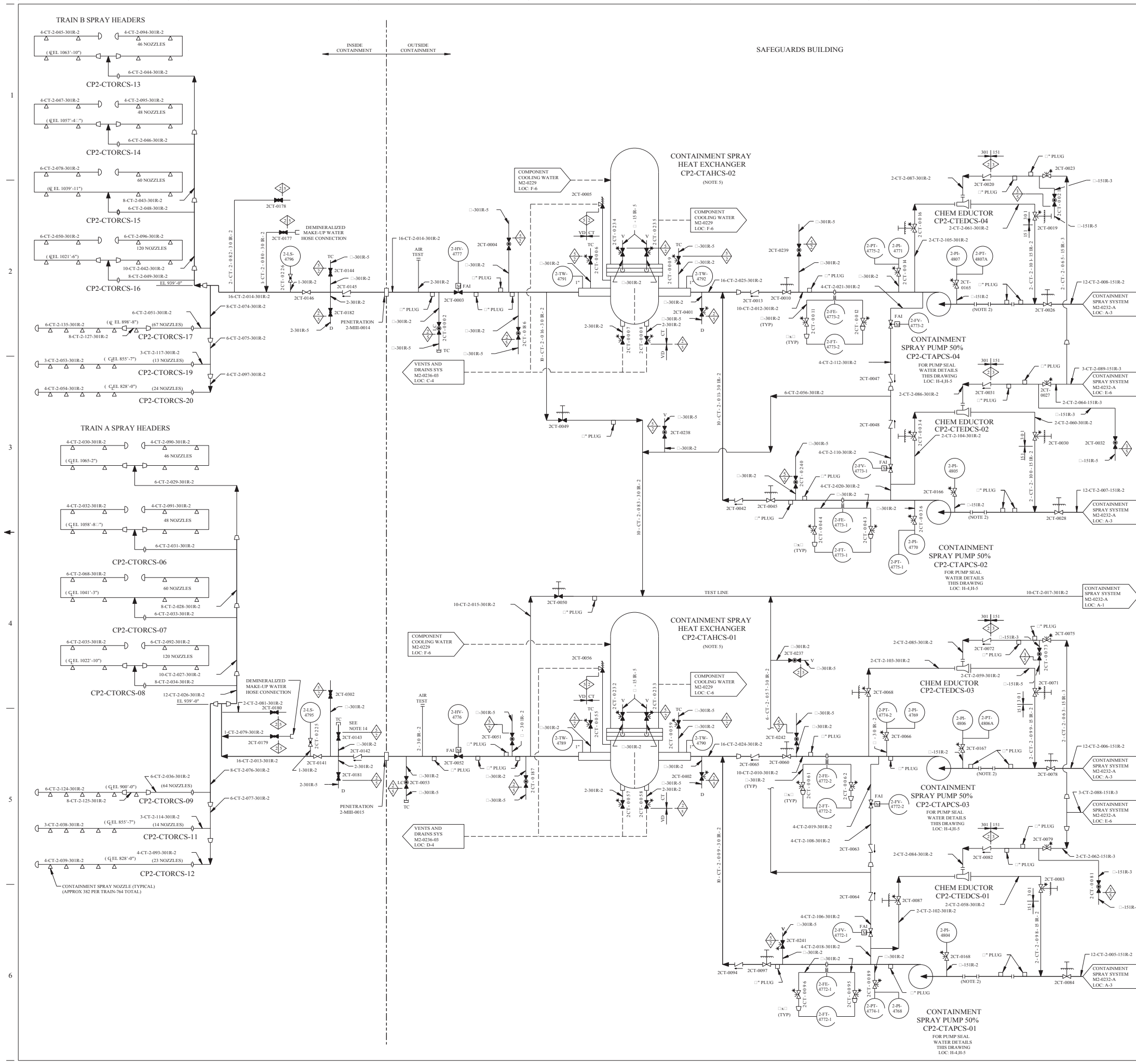
**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

**FLOW DIAGRAM**  
**CONTAINMENT SPRAY**  
**SYSTEM**

FSAR FIGURE 6.2.2-1

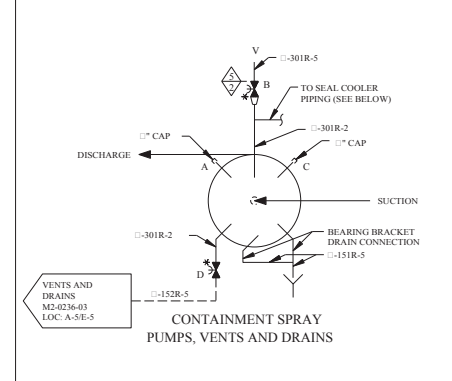
THIS DRAWING CREATED ELECTRONICALLY

\$\$\$\$\$DATES\$\$\$\$\$

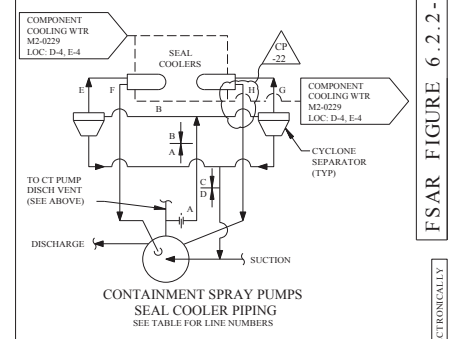


REV	DATE	CHKD	APPV	REMARKS
CP-22	08/21/2002			THIS DRAWING REVISED TO EDITORIALY CORRECT A DRAFTING ERROR THAT OCCURRED AUGUST 16, 2001 WHEN CP-14 OF THIS DRAWING WAS REVISED AND ISSUED PER ACRC-3102-01-049-1.

- NOTES:
- FOR DEFINITION OF SYMBOLS SEE DWG M1-0200.
  - TEMPORARY STRAINER (CP2-CTSTRS-01/02-03/04) AND THE SPOOL PIECE ARE INSTALLED DURING INITIAL FLUSHING OPERATIONS ONLY AND THE STRAINER MUST BE REMOVED PRIOR TO PLANT START UP. THE TEMPORARY STRAINERS CAN BE RE-INSTALLED FOR POST MAINTENANCE ACTIVITY.
  - DELETED
  - DELETED
  - ALL CONNECTIONS TO THE SHELL SIDE OF THE CS HEAT EXCHANGER ARE SHOWN ON THE COMPONENT COOLING WATER SYSTEM FLOW DIAGRAM DWG M2-0229-01.
  - DELETED
  - DELETED
  - DELETED
  - DELETED
  - UNLESS OTHERWISE NOTED DRAINS COLLECTED BY LOCAL DRAIN SYSTEM.
  - DELETED
  - DELETED
  - DELETED
  - VALVE 2CT-0143 IS TO BE ABANDONED AND THREADED CAP IS TO BE SEAL WELDED.
  - DELETED



PUMP	A (SUCTION)	B (DISCHARGE)	C (SUCTION)	D (CASING DRAIN)
CP2-CTAPCS-01	-	2CT-0192	-	2CT-0088
CP2-CTAPCS-02	-	2CT-0193	-	2CT-0035
CP2-CTAPCS-03	-	2CT-0194	-	2CT-0069
CP2-CTAPCS-04	-	2CT-0195	-	2CT-0017



PUMP NUMBER	VALVE NUMBER	XXX FOR LINE NUMBERS													
		A	B	C	D	E	F	G	H	I	J	K			
CP2-CTAPCS-01	2CT-0192	905	906	907	908	909	910	911	912						
CP2-CTAPCS-02	2CT-0193	913	914	915	916	917	918	919	920						
CP2-CTAPCS-03	2CT-0194	921	922	923	924	925	926	927	928						
CP2-CTAPCS-04	2CT-0195	929	930	931	932	933	934	935	936						

DRAWING: 2232-M2-0232	REV: CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
M2-0232	
M2-0232-A	

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1	SEISMIC CATEGORY I
SAFETY CLASS 2	CLASS I-E
SAFETY CLASS 3	ASSOCIATED CIRCUITS

**LUMINTAP CPNPP**  
GLEN ROSE, TEXAS

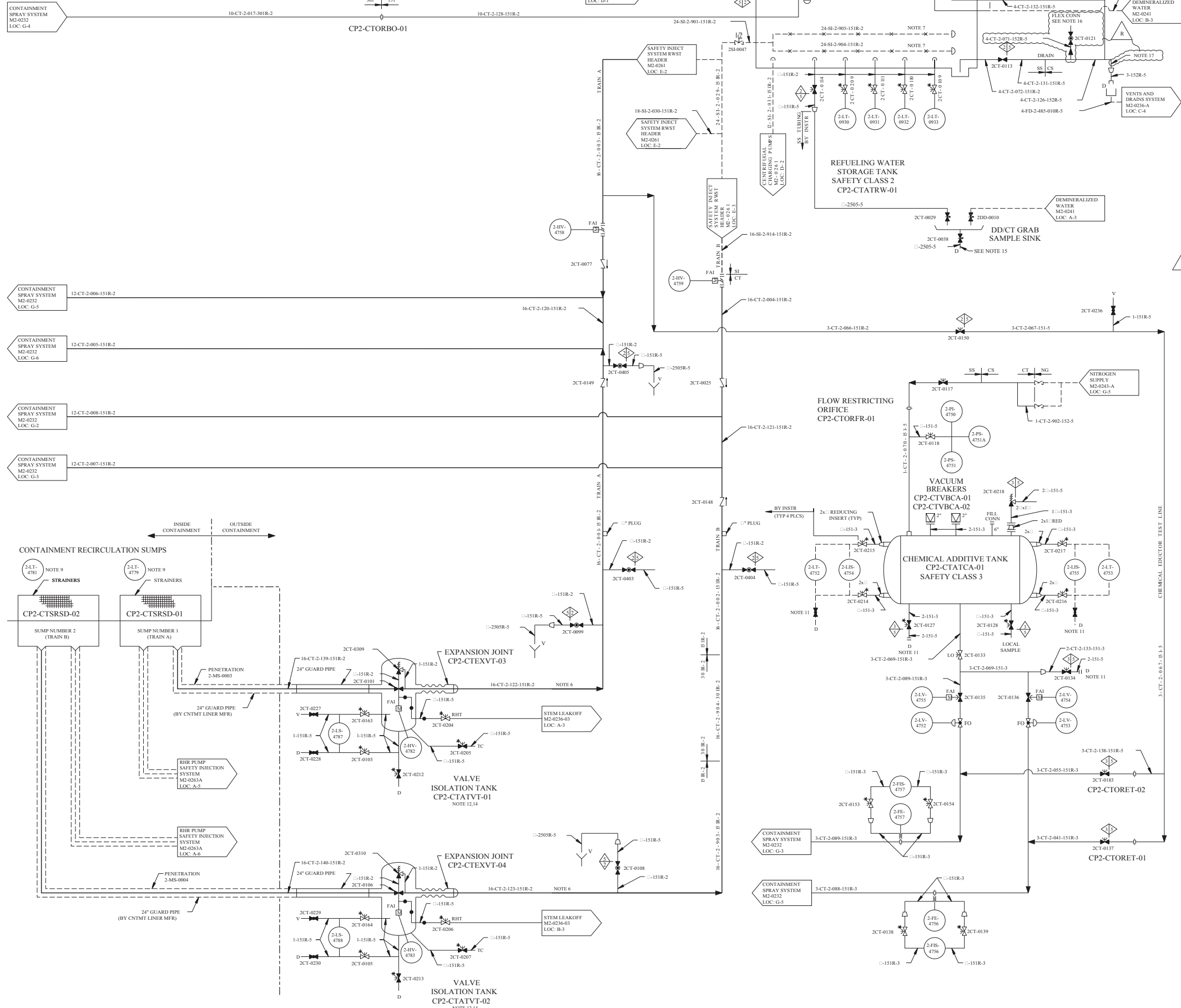
**FLOW DIAGRAM**  
**CONTAINMENT SPRAY SYSTEM**

DWG NO: M2-0232 SH NO: - REV: CP-22

FSAR FIGURE 6.2.2-1

THIS DRAWING CREATED ELECTRONICALLY

SAFEGUARDS BUILDING



REV	DWN	CHKD	APVD	REMARKS
7-20	MM	MM	MM	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA 2013-000008-15-00 PER SK-0001-13-000008-15-00.

- NOTES:
- FOR DEFINITION OF SYMBOLS SEE DRAWING M1-0200.
  - DELETED
  - DELETED
  - LINE TO TERMINATE ABOVE MAXIMUM WATER LEVEL.
  - DELETED
  - PIPING TO BE 16" SCH 120 OR 140 SEAMLESS SA 376, TP 304 OR TP 316. FITTINGS TO BE 16" SCH 120 SEAMLESS SA 403, TP 304 OR TP 316.
  - ANTI-VORTEX BAFFLE PIPE.
  - DELETED
  - WALL MOUNTED LEVEL TRANSMITTER ASSEMBLIES.
  - UNLESS OTHERWISE NOTED DRAINS COLLECTED BY LOCAL DRAIN SYSTEM.
  - FLUID COLLECTED FROM DRAINS AND VENTS OFF THE CHEMICAL ADDITIVE TANK SHALL BE DISPOSED OF IN AN APPROPRIATE MANNER BY CHEMISTRY.
  - VALVE ISOLATION TANK, EXPANSION JOINT, GUARD PIPE, VENT DRAIN, VALVE STEM LEAK-OFF PIPING AND RELATED VALVES WERE FABRICATED, TESTED AND INSTALLED TO ANSI SAFETY CLASS 2, ASME CODE CLASS 2 REQUIREMENTS. THESE COMPONENTS AND PIPING HAVE BEEN RECLASSIFIED IN THEIR CURRENT APPLICATION TO NON-NUCLEAR SAFETY (NNS) SEISMIC CATEGORY II (FOR STRUCTURAL INTEGRITY AND ENHANCED LEAK DETECTION). THE ASME CODE CLASSIFICATION NEED NOT BE MAINTAINED AND THEREFORE, WORK NEED NOT BE PERFORMED TO ASME XI REQUIREMENTS.
  - DELETED
  - VALVE ISOLATION TANK MANWAYS PROVIDE AN OPEN VENT PATH THRU THE OPEN MANWAY.
  - SAMPLE SINK DRAIN COLLECTED IN A CONTAINER AND TRANSPORTED TO A DRAIN CAPABLE OF ACCEPTING RADIOACTIVE FLUIDS.
  - FLEX CONNECTION MAY BE A PIPE CAP OR STORZ FITTING.
  - WHEN FLEX CONN IS UTILIZED, DRAIN LINE 4-CT-2-126-152R-5 SHALL BE ISOLATED WITH 2" NST/1N1 PIPE CAP. PIPE CAP MAINTAINED IN FLEX WAREHOUSE.

DRAWING	2323-M2-0232	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
M2-0232			
M2-0232-A			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS IIE  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

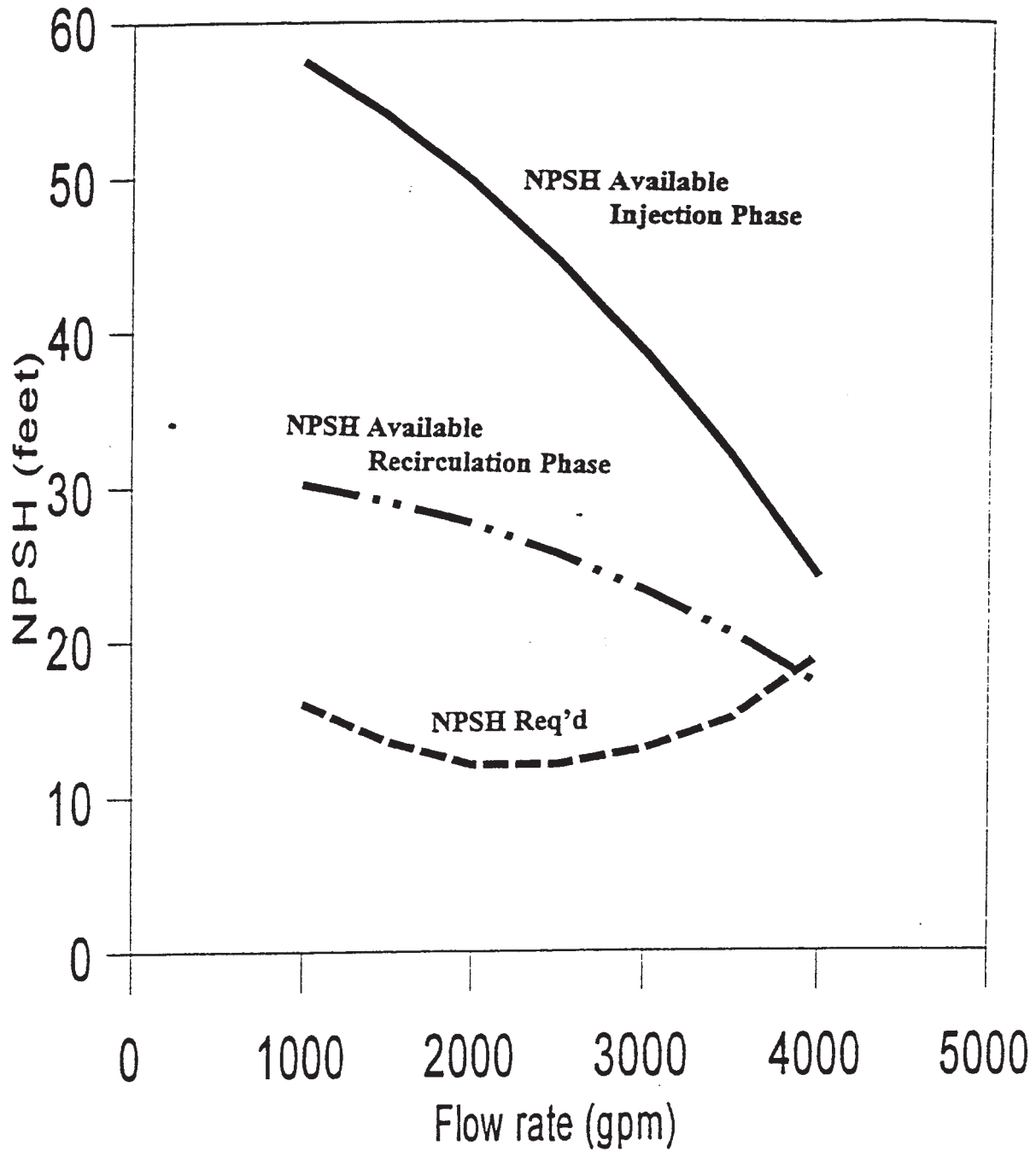
**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

**FLOW DIAGRAM**  
**CONTAINMENT SPRAY**  
**SYSTEM**

FSAR FIGURE 6.2.2-1

THIS DRAWING CREATED ELECTRONICALLY

\$\$\$\$\$DATE\$\$\$\$\$



Amendment 96  
August 2, 1999

<p>COMANCHE PEAK S.E.S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>CONTAINMENT SPRAY PUMPS AVAILABLE NPSH</p>
<p>FIGURE 6.2.2-2 SHEET 1</p>



SEE FIGURE 6.2.2-3A  
FOR ARRANGEMENT OF SUMP  
MODULAR SURE-FLOW STRAINER

SEE FIGURE 6.2.2-3A  
FOR ARRANGEMENT OF SUMP  
MODULAR SURE-FLOW STRAINER

SEE FIGURE 6.2.2-3A  
FOR ARRANGEMENT OF SUMP  
MODULAR SURE-FLOW STRAINER

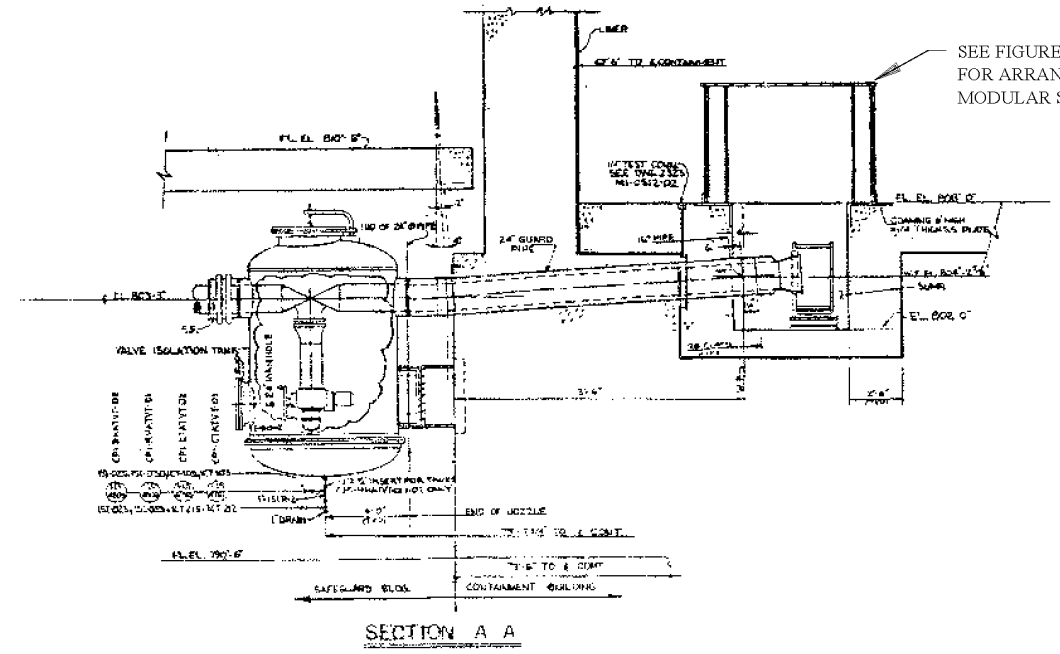
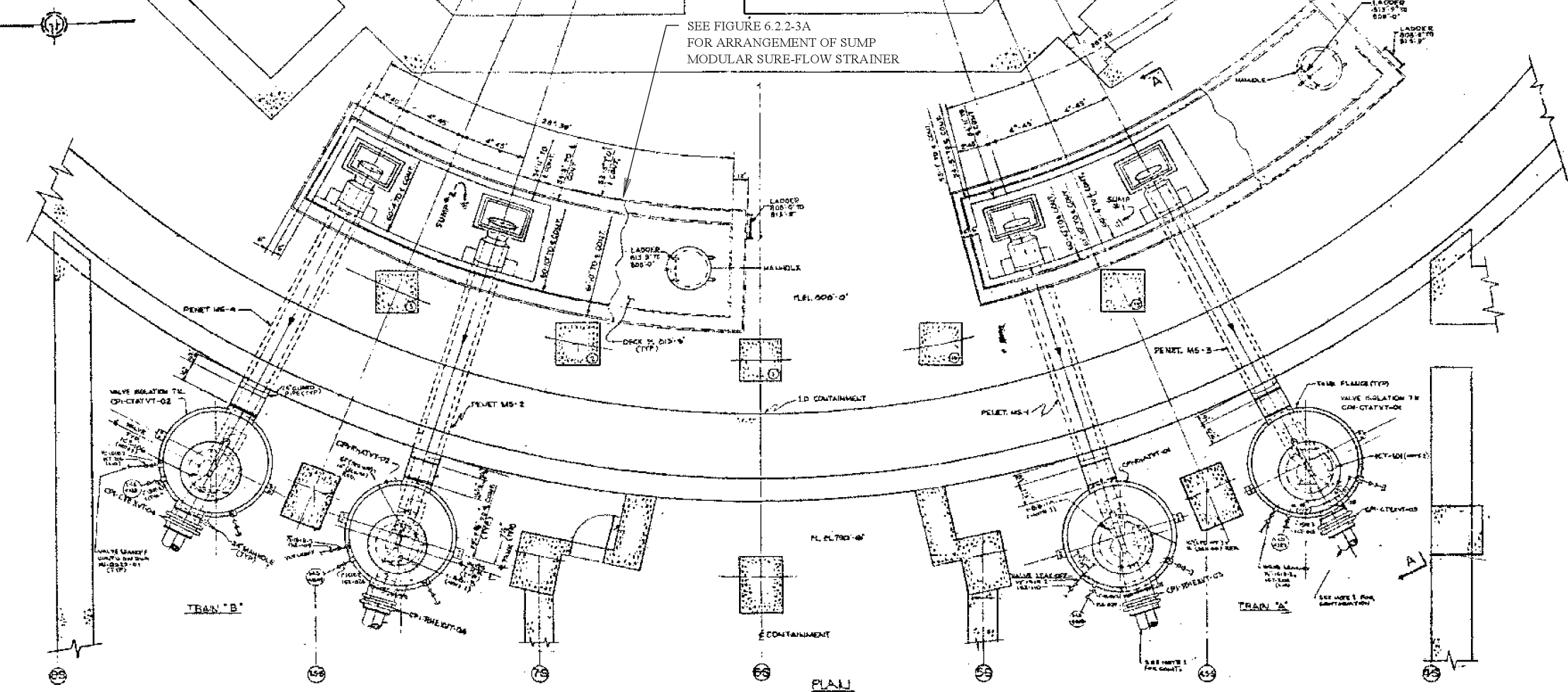
- NOTES**
1. 200 PIPING WITH IN LINE CONTAMINATION
  2. 200 PIPING WITH IN LINE CONTAMINATION
  3. 200 PIPING WITH IN LINE CONTAMINATION
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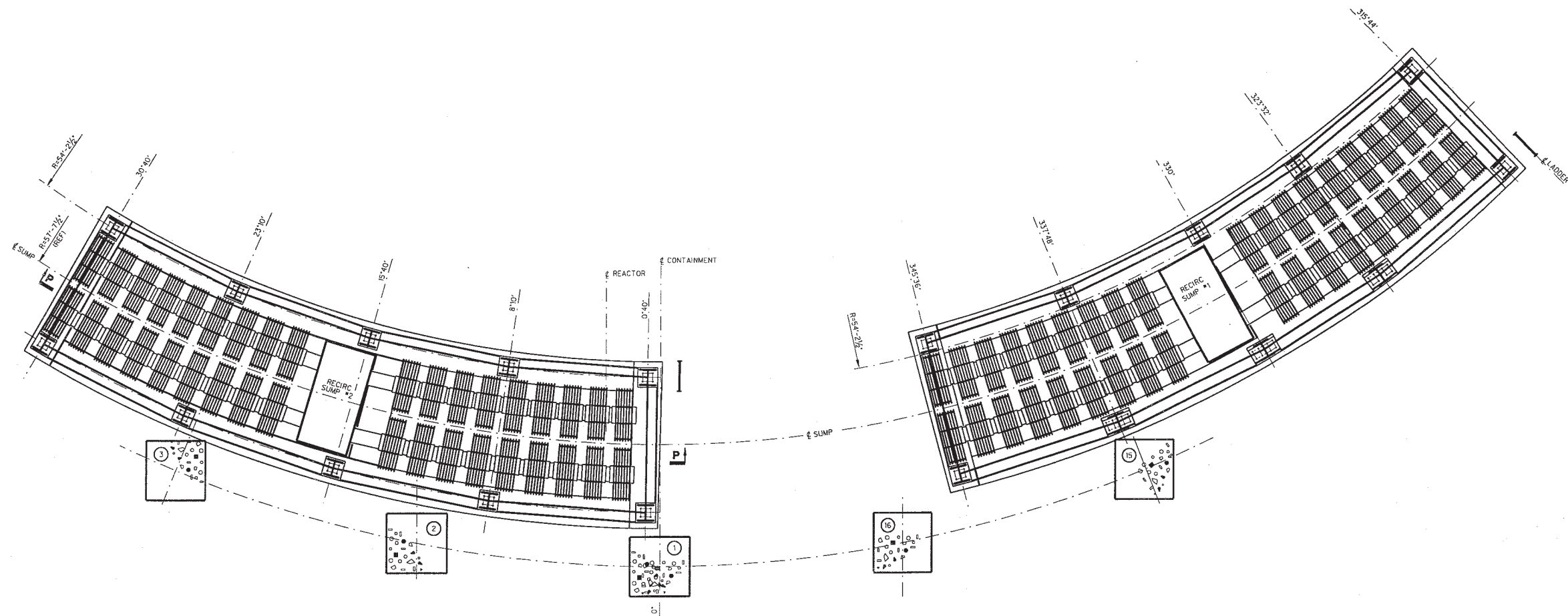
Amendment 102

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

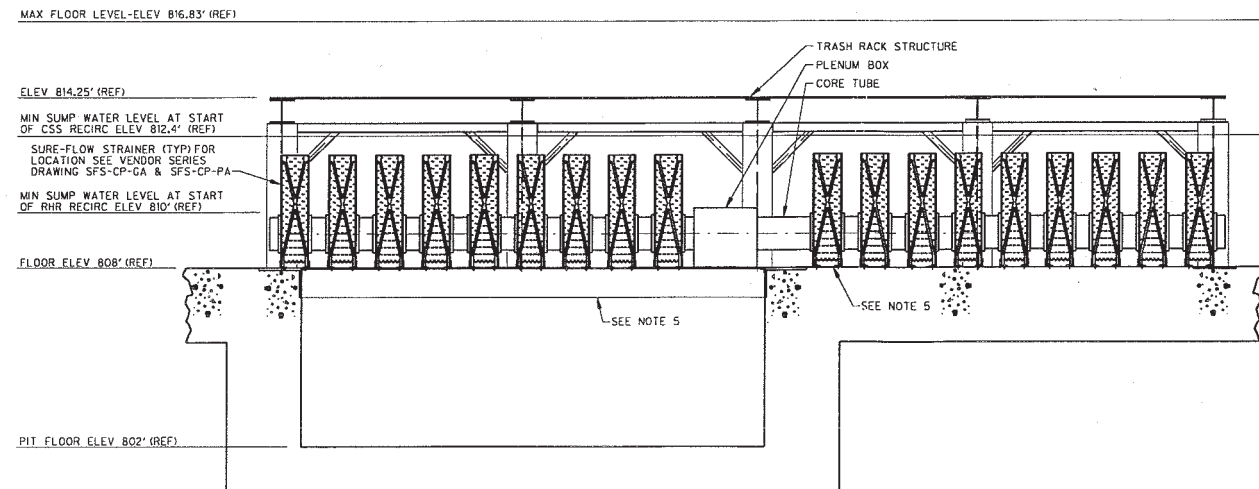
ARRANGEMENT  
OF SUMP PIPING &  
VALVE ISOLATION TANK

FIGURE 6.2.2-3





PARTIAL PLAN REACTOR BLDG AT ELEV 808'-0"



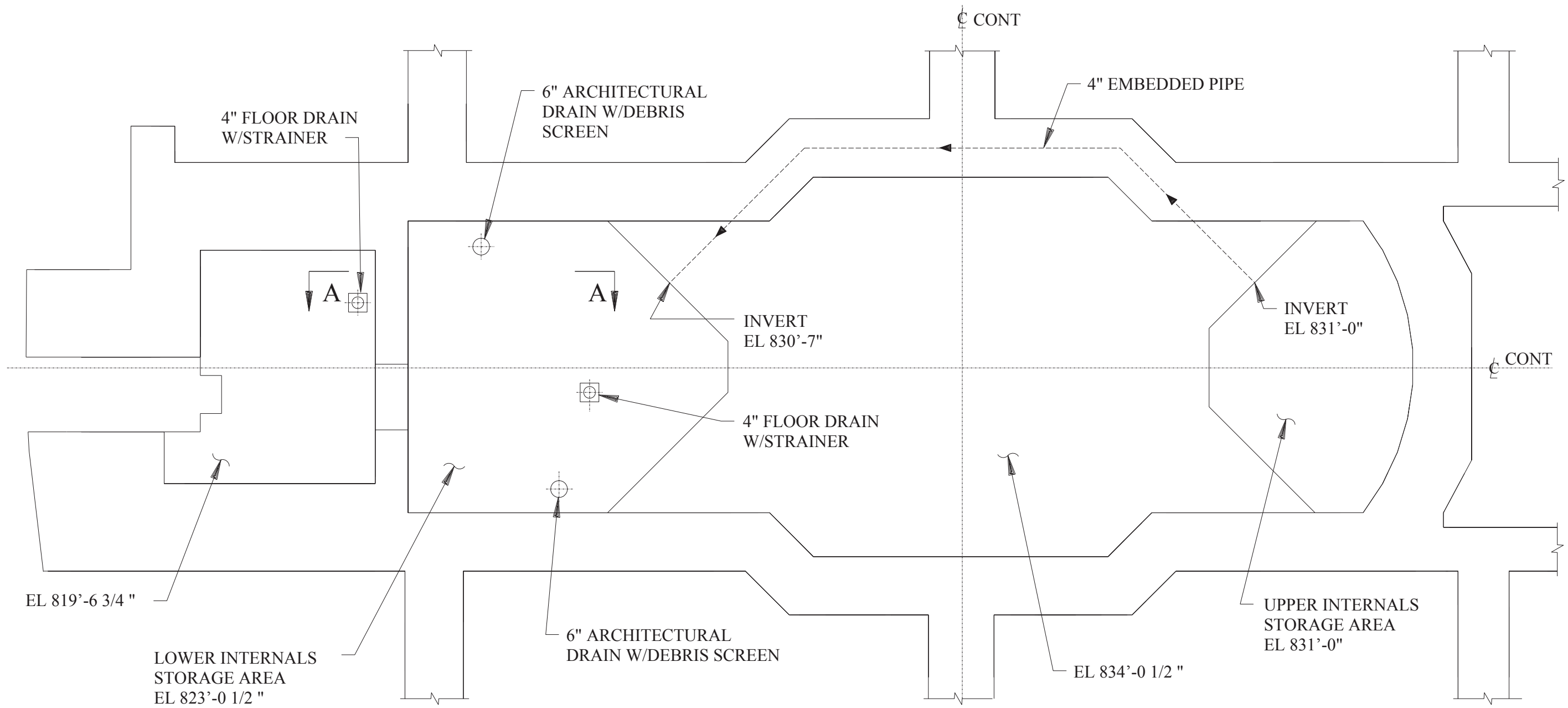
ELEVATION VIEW SECT P-P

- NOTES:
1. UNIT 1 AS SHOWN.
  2. UNIT 2 IS MIRROR IMAGE.
  3. WORK THIS FIGURE WITH FIGURE 6.2.2-3, ARRANGEMENT OF SUMP PIPING AND VALVE ISOLATION TANK.
  4. THIS FIGURE SUPERSEDES/DELETES THE FOLLOWING ON FIGURE 6.2.2-3:
    - CALLOUT FOR FINE AND COARSE SCREENS.
    - LADDER FROM MANHOLE TO THE FLOOR ELEV 808'.
    - LADDER FROM FLOOR ELEV 808' TO THE SUMP PIT AT ELEV 802'.
  5. MODULAR SUMP STRAINERS ARE SUPPORTED ON THE CONCRETE ON ONE SIDE OF PLENUM BOX AND SUPPORTED BY THE COVER PLATE ON THE SUMP PIT.

Amendment 101b

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
ARRANGEMENT OF RECIRC SUMP 1 & 2 MODULAR SURE-FLOW STRAINER
FIGURE 6.2.2-3A

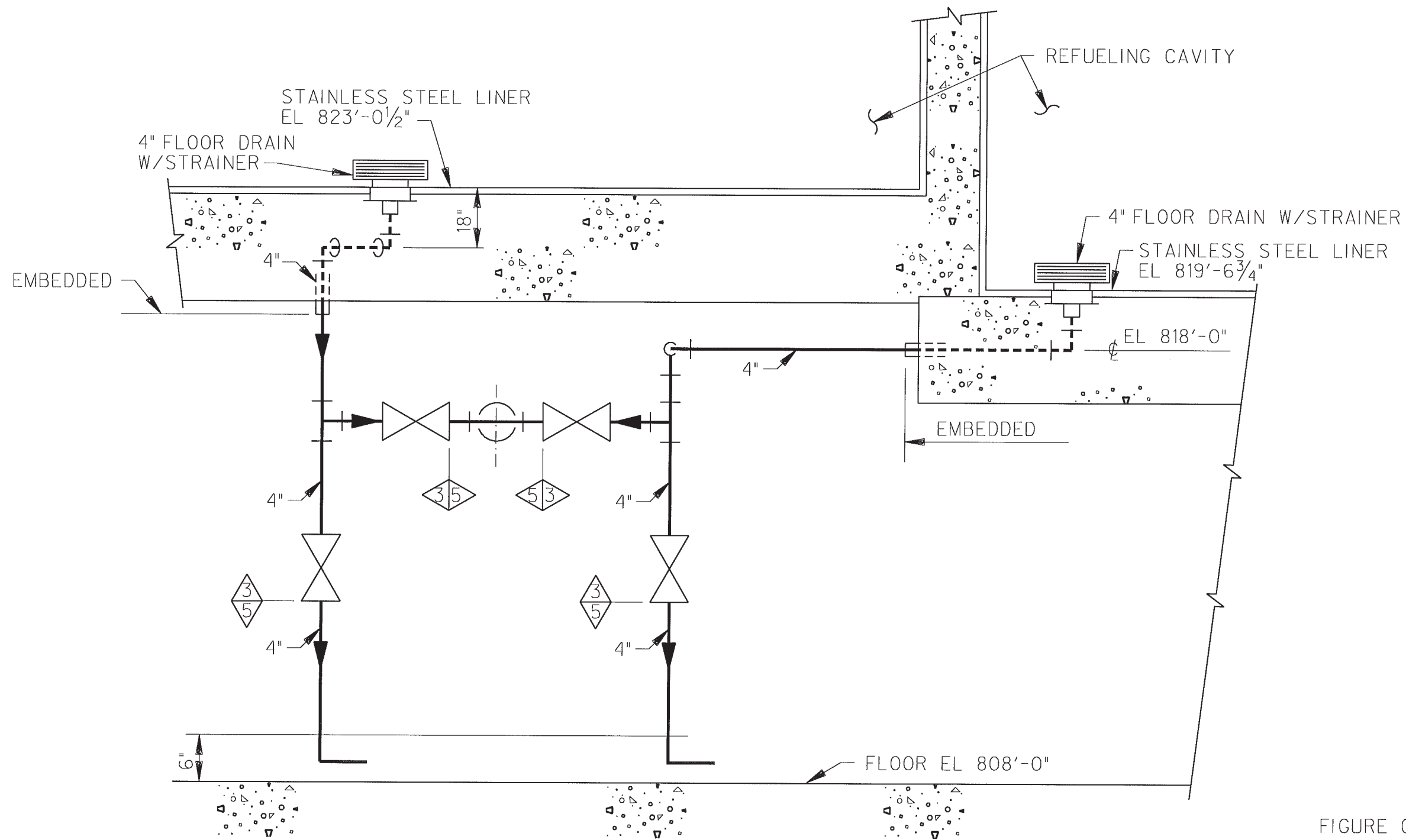




NOTE:  
FOR ELEVATION SEE FIG 6.2.2-5

Amendment 101b

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
REACTOR CAVITY DRAIN SYSTEM PLAN
FIGURE 6.2.2-4



### SECTION A-A

NOTE:  
FOR FLOOR PLAN SEE FIGURE 6.2.2-4

Amendment 101b

FIGURE GENERATED FOR FSAR ONLY

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

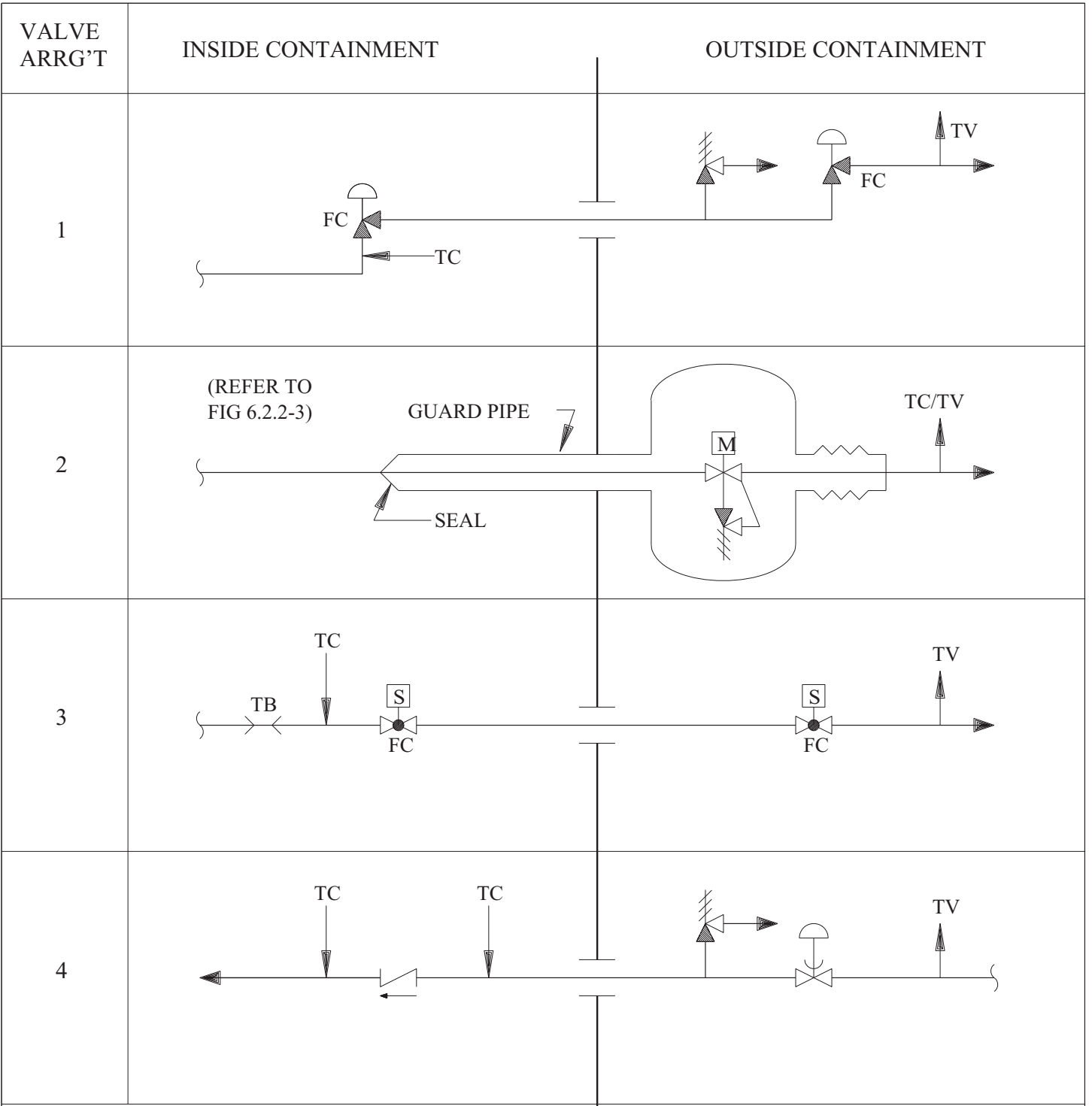
REACTOR CAVITY DRAIN  
SYSTEM ELEVATION

FIGURE 6.2.2-5

\$\$\$\$\$DATE\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY

CPE



NOTES

- TB-TEST BARRIER
- TC-TEST CONNECTION
- TV-TEST VENT
- FC-FAIL CLOSE
- S -SOLENOID
- M -MOTOR
- LC-LOCKED CLOSED

CONTAINMENT WALL

Amendment 87  
December 18, 1992

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ISOLATION VALVING
FIGURE 6.2.4-1 SH 1 OF 12

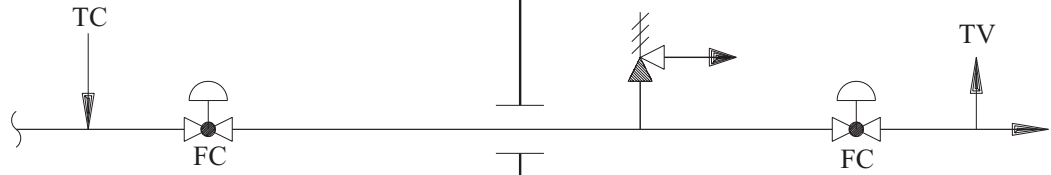
10-12-01

VALVE  
ARRG'T

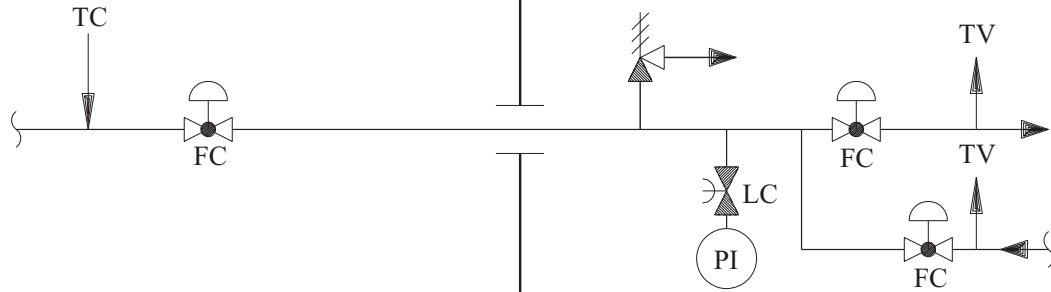
INSIDE CONTAINMENT

OUTSIDE CONTAINMENT

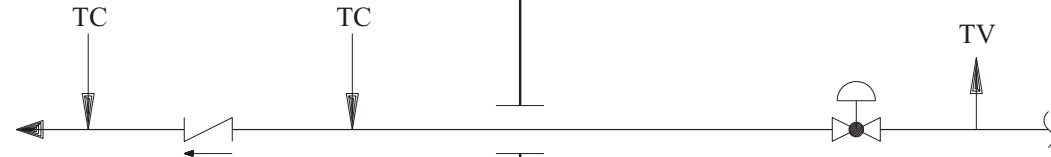
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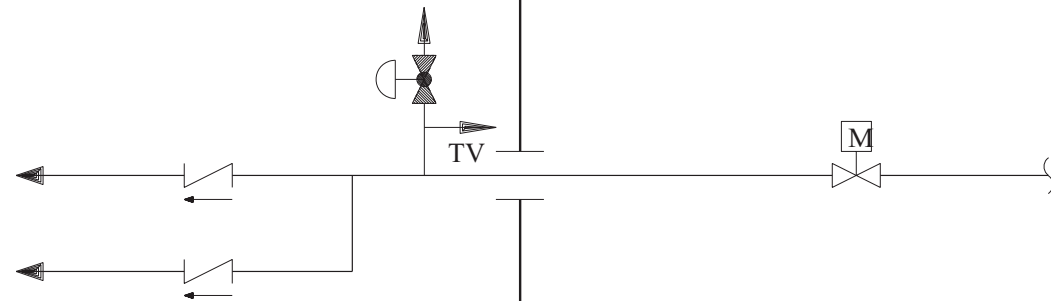
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7



8



CONTAINMENT WALL

Amendment 83  
December 13, 1991

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

CONTAINMENT ISOLATION  
VALVING

FIGURE 6.2.4-1 SH 2 OF 12

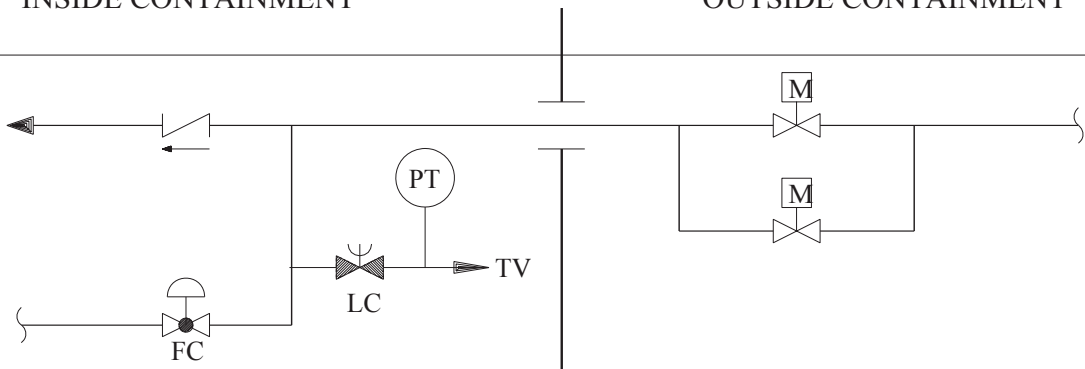
CPE

VALVE  
ARRG'T

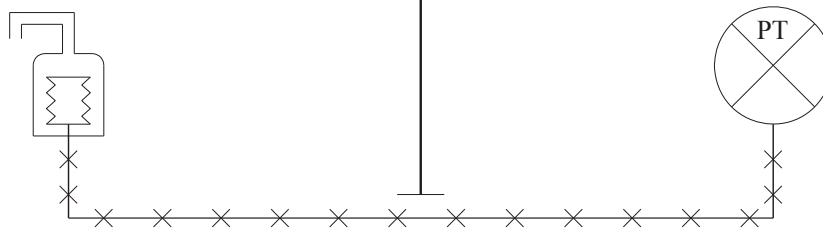
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OUTSIDE CONTAINMENT

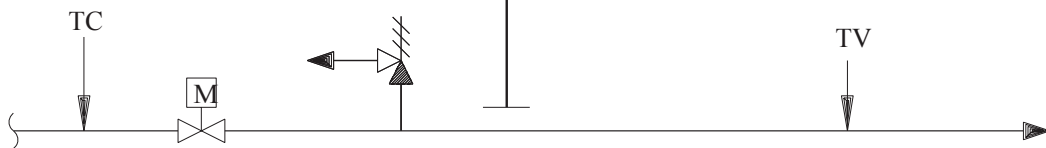
9



10



11



12



CONTAINMENT  
WALL

Amendment No. 103a

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

CONTAINMENT ISOLATION  
VALVING

FIGURE 6.2.4-1 SH 3 OF 12

07-27-10

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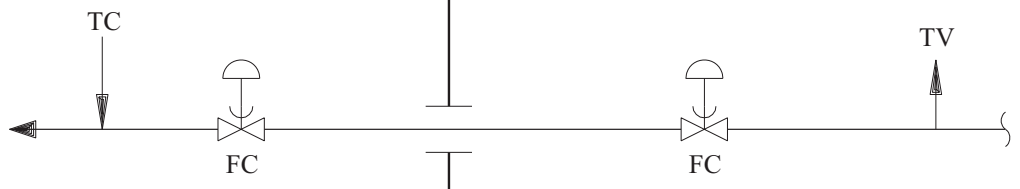
CPE

VALVE  
ARRG'T

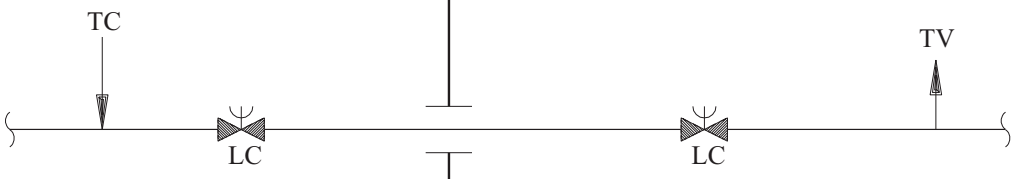
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OUTSIDE CONTAINMENT

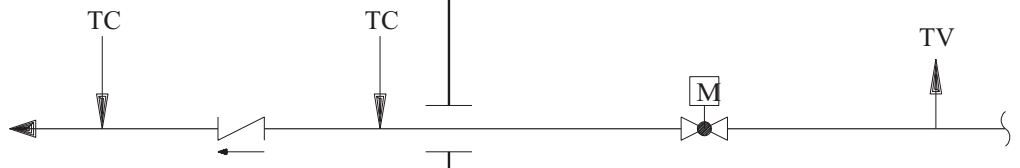
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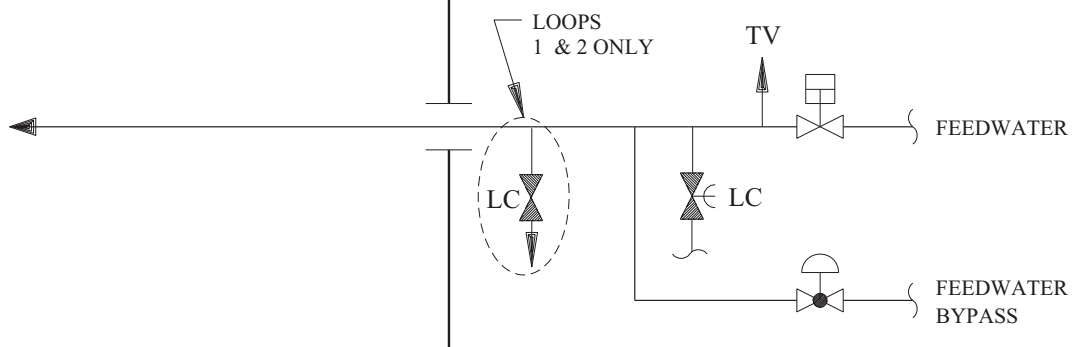
14



15



16



CONTAINMENT WALL

Amendment 99

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

CONTAINMENT ISOLATION  
VALVING

FIGURE 6.2.4-1 SH 4 OF 12

01-27-04

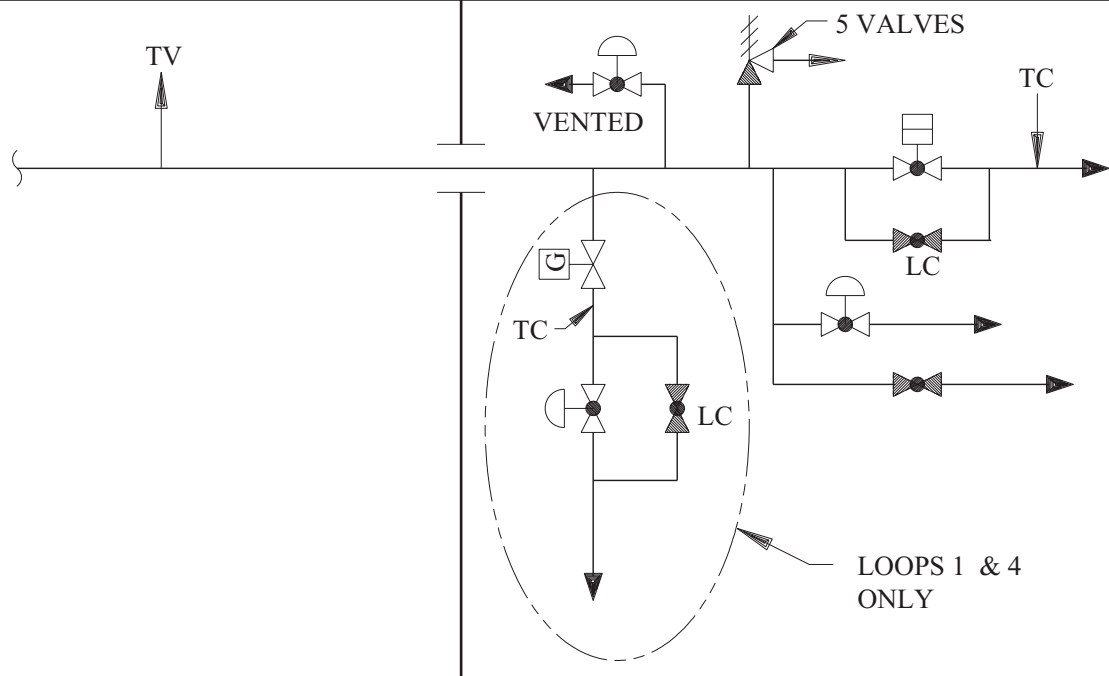
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VALVE ARR'G'T

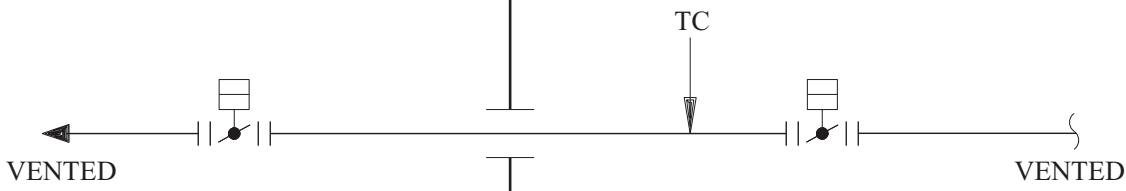
INSIDE CONTAINMENT

OUTSIDE CONTAINMENT

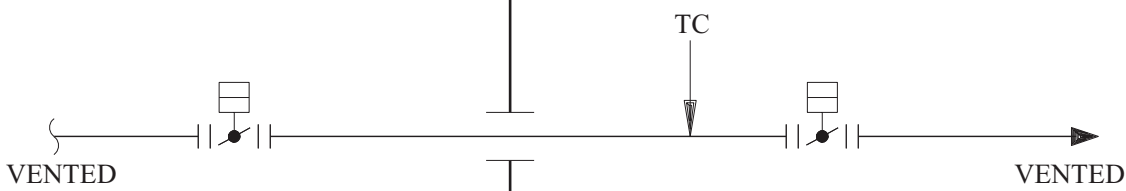
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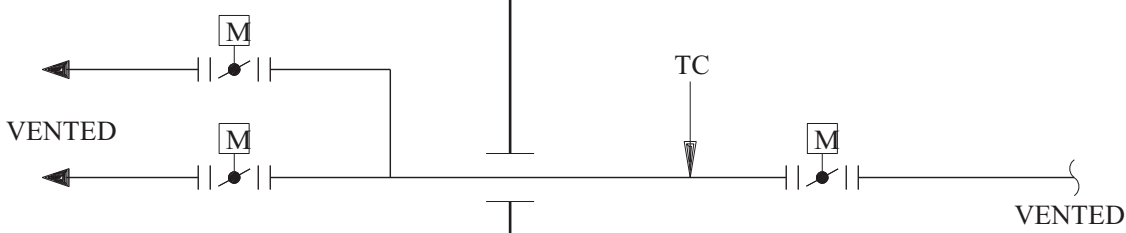
18



19



20

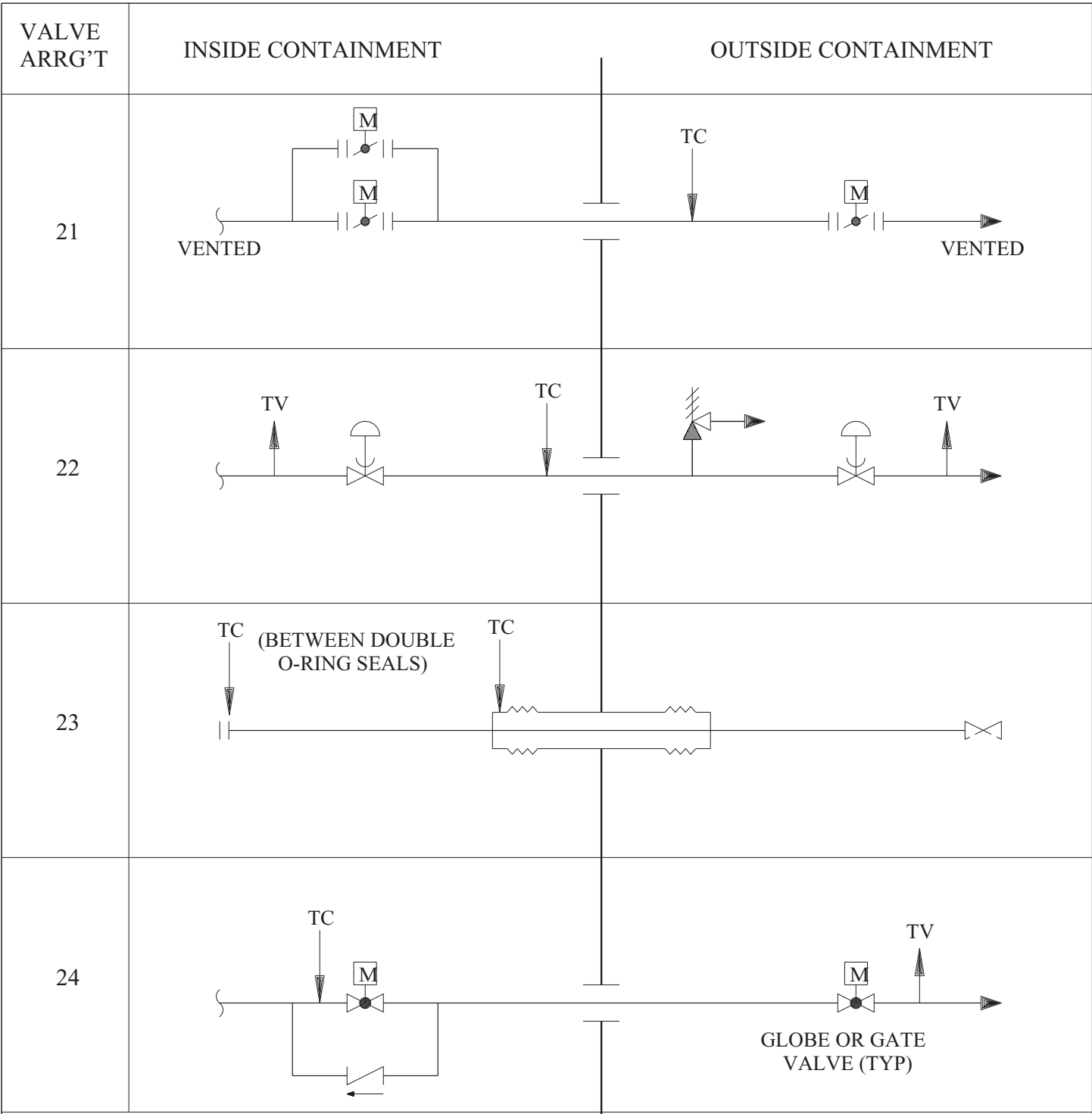


CONTAINMENT WALL

Amendment 96  
August 2, 1999

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ISOLATION VALVING
FIGURE 6.2.4-1 SH 5 OF 12

CPE



CONTAINMENT WALL

Amendment 66  
January 15, 1988

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ISOLATION VALVING
FIGURE 6.2.4-1 SH 6 OF 12

10-12-01

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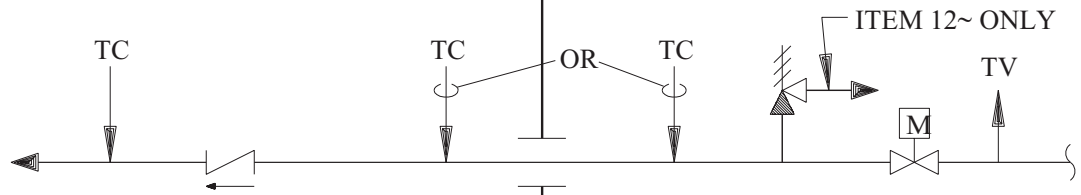
CPE

VALVE  
ARRG'T

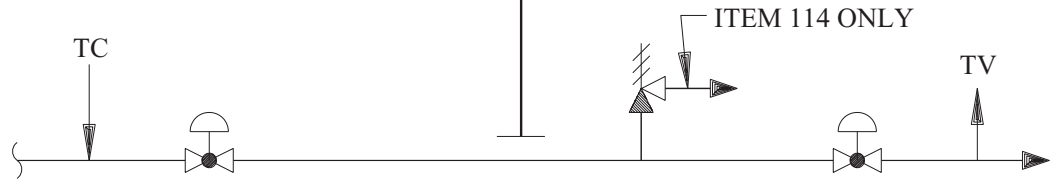
INSIDE CONTAINMENT

OUTSIDE CONTAINMENT

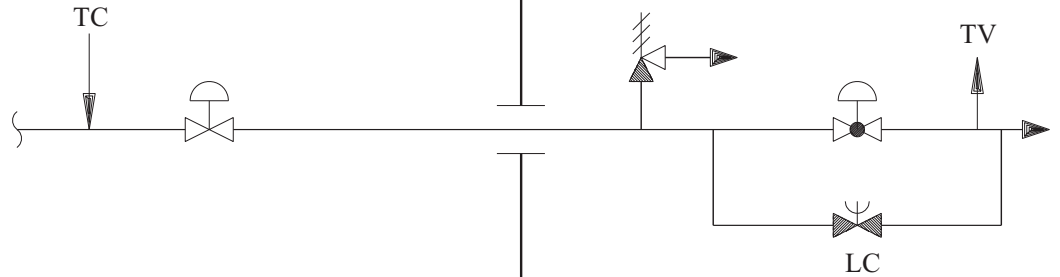
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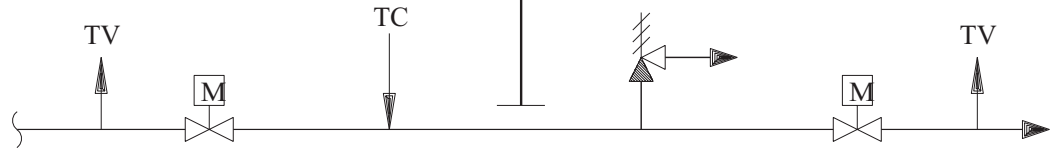
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27



28



CONTAINMENT WALL

Amendment 66  
January 15, 1988

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

CONTAINMENT ISOLATION  
VALVING

FIGURE 6.2.4-1 SH 7 OF 12

10-12-01

ve00034g.dgn

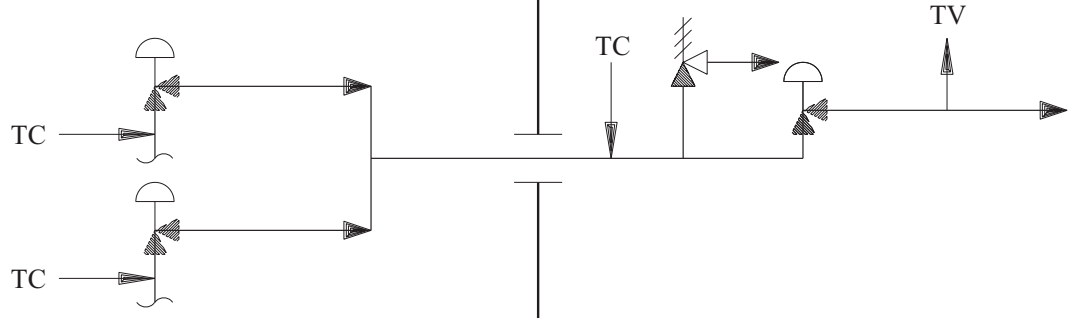
CPE

VALVE  
ARRG'T

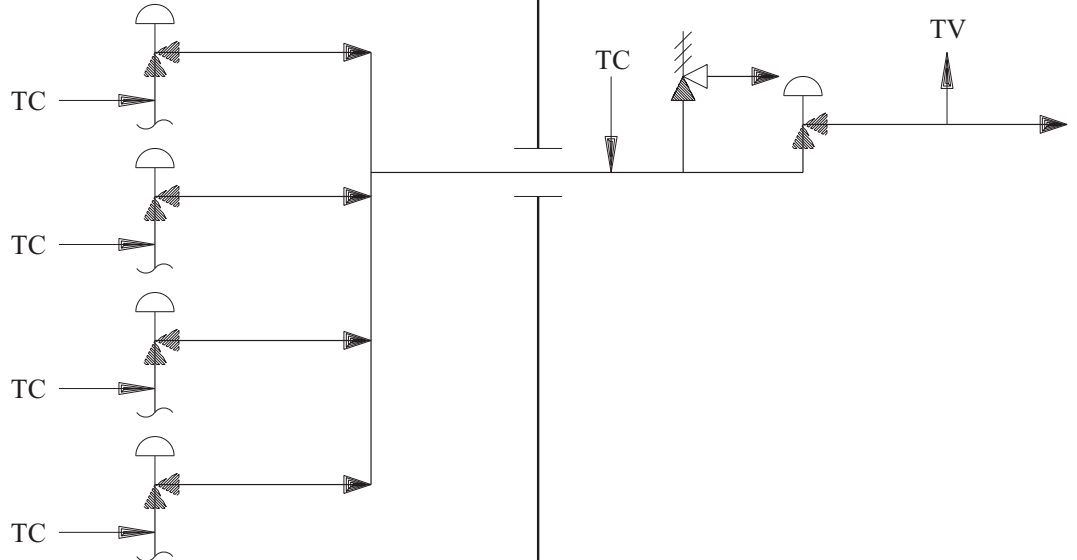
INSIDE CONTAINMENT

OUTSIDE CONTAINMENT

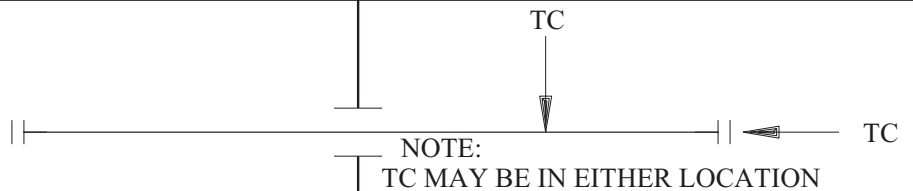
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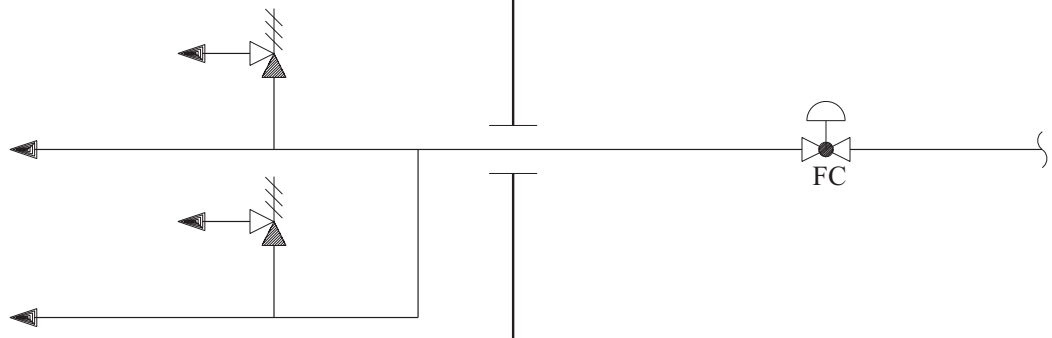
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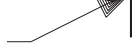
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32



CONTAINMENT WALL



Amendment 83  
December 13, 1991

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

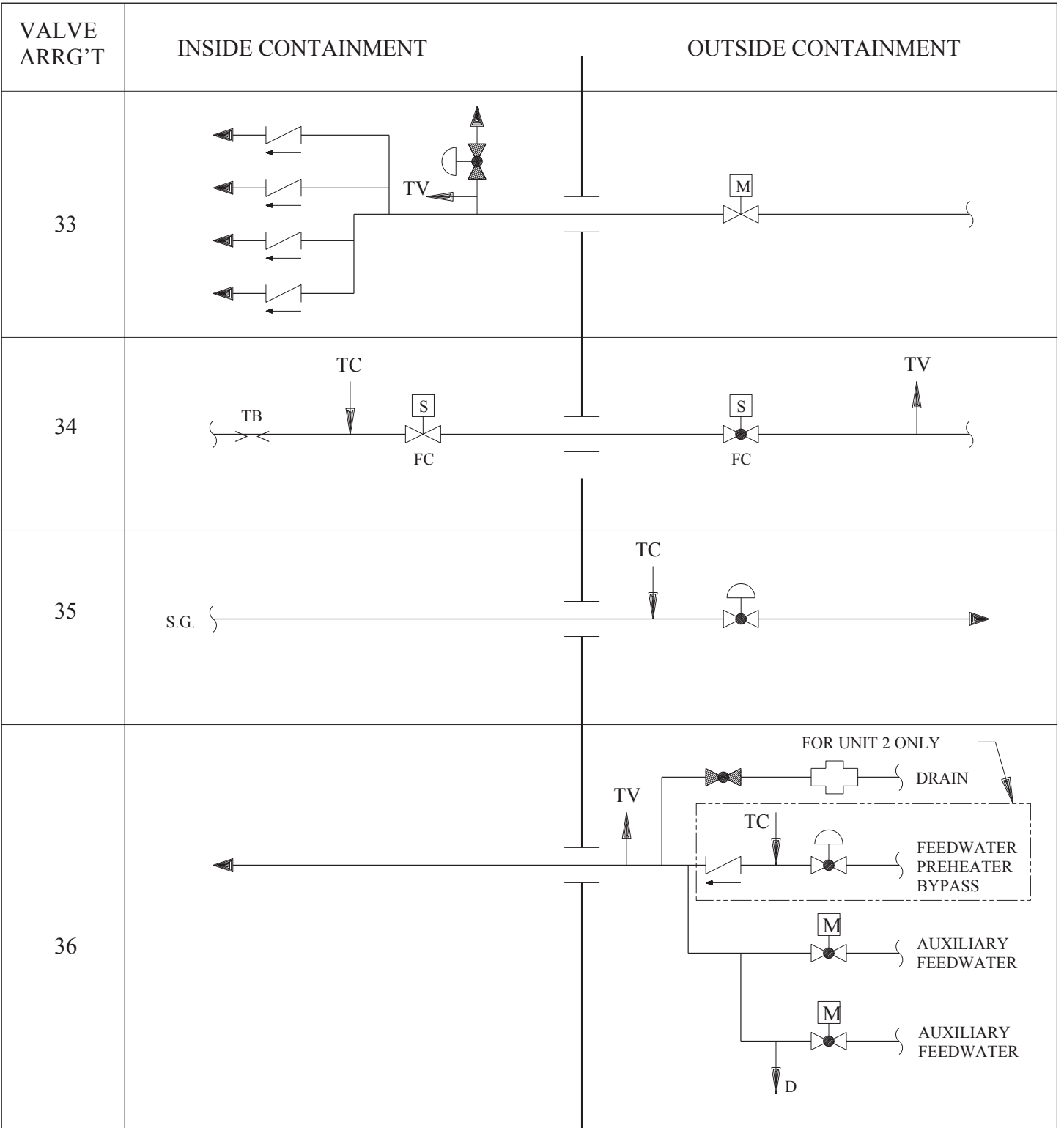
CONTAINMENT ISOLATION  
VALVING

FIGURE 6.2.4-1 SH 8 OF 12

10-12-01

ve00034h.dgn

CPE



CONTAINMENT WALL

**Amendment 101b**

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ISOLATION VALVING
FIGURE 6.2.4-1 SH 9 OF 12

08-03-07

VALVE ARR'G'T	INSIDE CONTAINMENT	OUTSIDE CONTAINMENT
37		
38		
39		
40	<p data-bbox="258 1209 333 1258">UNIT 1 PAL</p>	

CONTAINMENT WALL →

Amendment 96  
August 2, 1999

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
CONTAINMENT ISOLATION VALVING
FIGURE 6.2.4-1 SH 10 OF 12

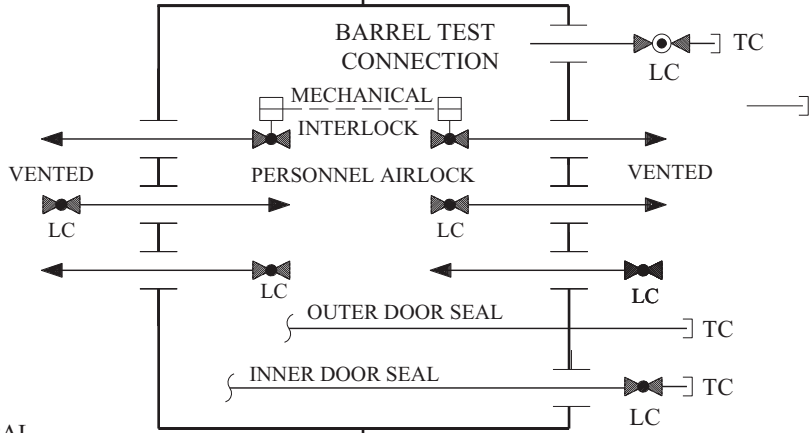
VALVE ARR'G'T

INSIDE CONTAINMENT

OUTSIDE CONTAINMENT

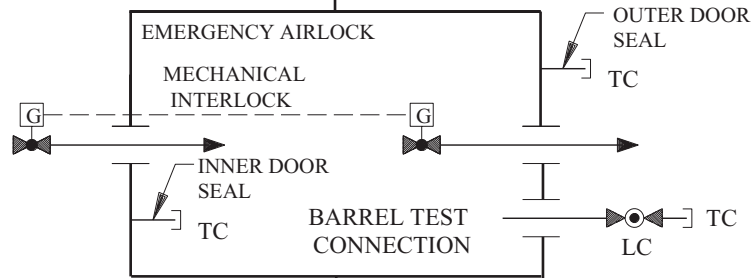
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UNIT 1 PAL

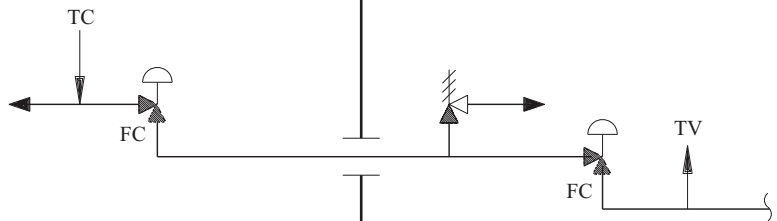


42

UNIT 1 & 2  
EAL



43



Amendment 96  
August 2, 1999

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

CONTAINMENT ISOLATION  
VALVING

FIGURE 6.2.4-1 SH 11 OF 12

CPE

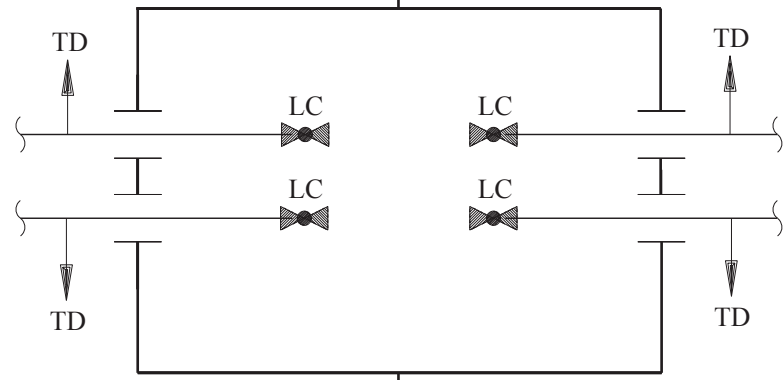
VALVE  
ARRG'T

INSIDE CONTAINMENT

OUTSIDE CONTAINMENT

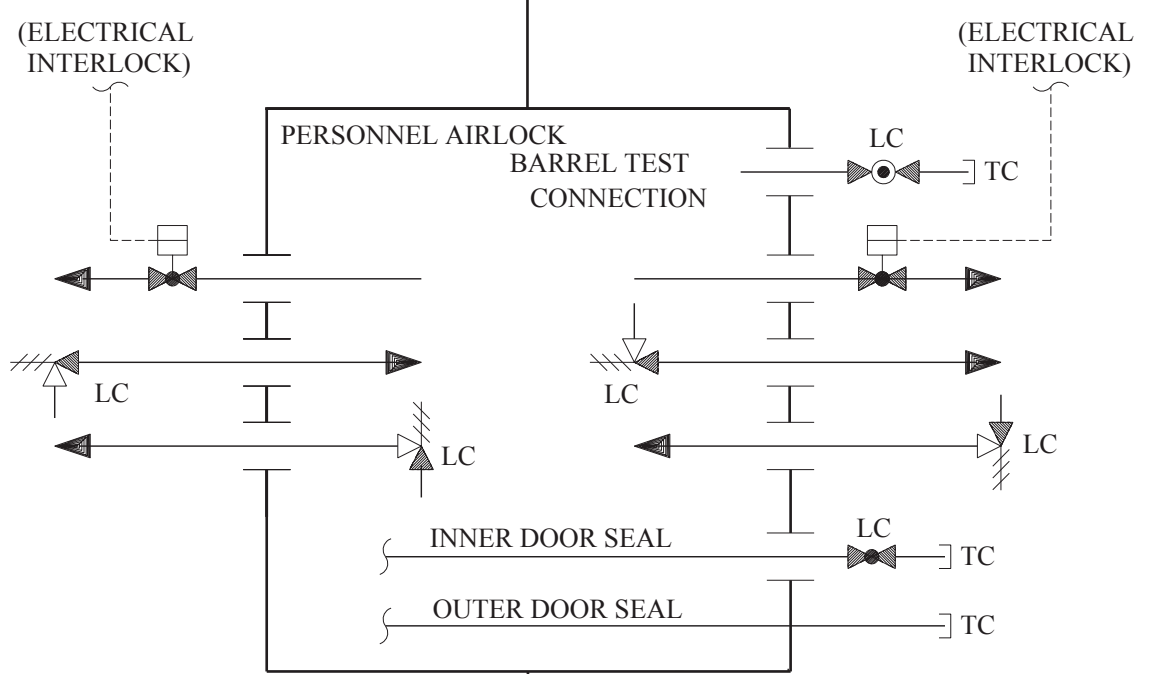
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UNIT 2  
PAL

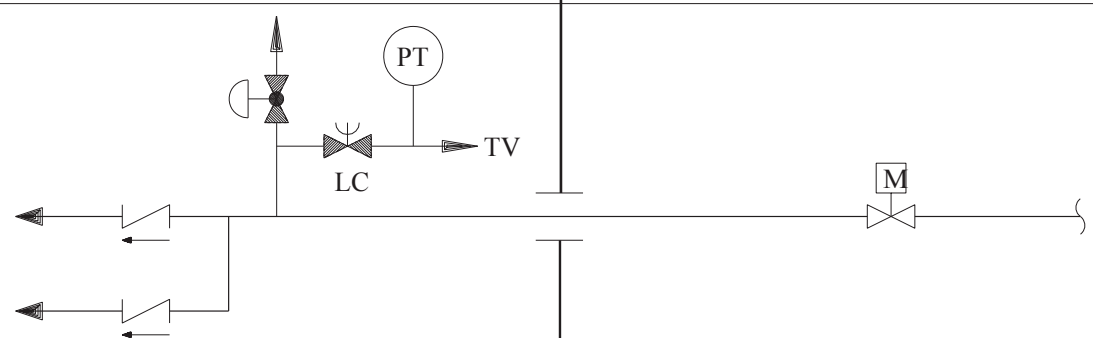


Amendment 96  
August 2, 1999

UNIT 2  
PAL



46



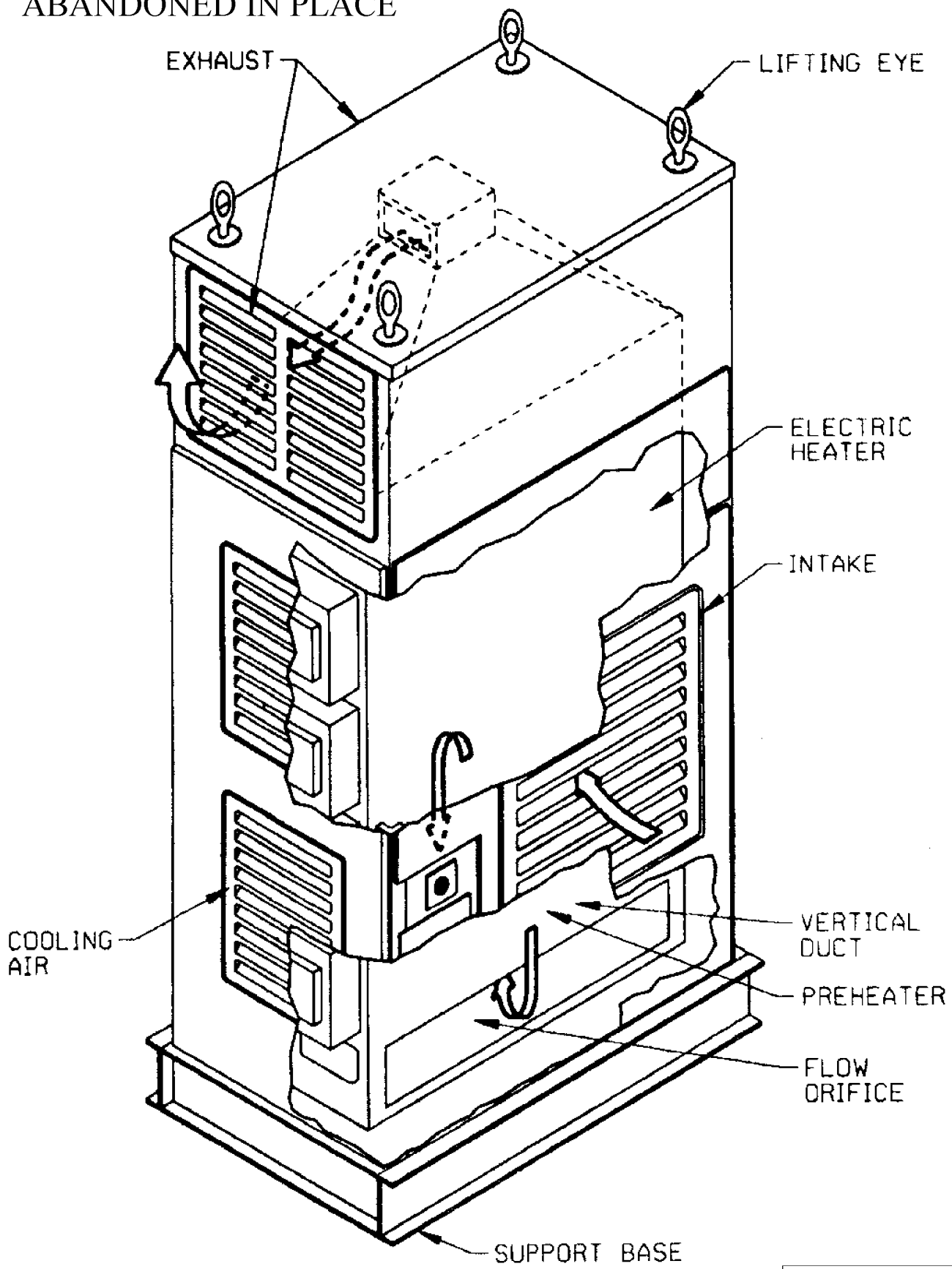
CONTAINMENT  
WALL

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

CONTAINMENT ISOLATION  
VALVING

FIGURE 6.2.4-1 SH 12 OF 12

# ABANDONED IN PLACE



COMANCHE PEAK S E S  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 AND 2

ELECTRIC HYDROGEN  
 RECOMBINER

FIGURE 6.2.5-1

Amendment 101b

CPSSES / FSAR  
FIGURE 6.2.5-2

DELETED



FIGURE 6.2.5-3  
HAS BEEN DELETED

CPSSES / FSAR  
FIGURE 6.2.5A-1

DELETED

CPSSES / FSAR  
FIGURE 6.2.5A-2

DELETED

CPSSES / FSAR  
FIGURE 6.2.5A-3

DELETED

FIGURE 6.2.5A-4  
HAS BEEN DELETED

CPSSES / FSAR  
FIGURE 6.2.5A-5

DELETED

FIGURE 6.2.5A-6  
HAS BEEN DELETED

CPSSES / FSAR  
FIGURE 6.2.5A-7

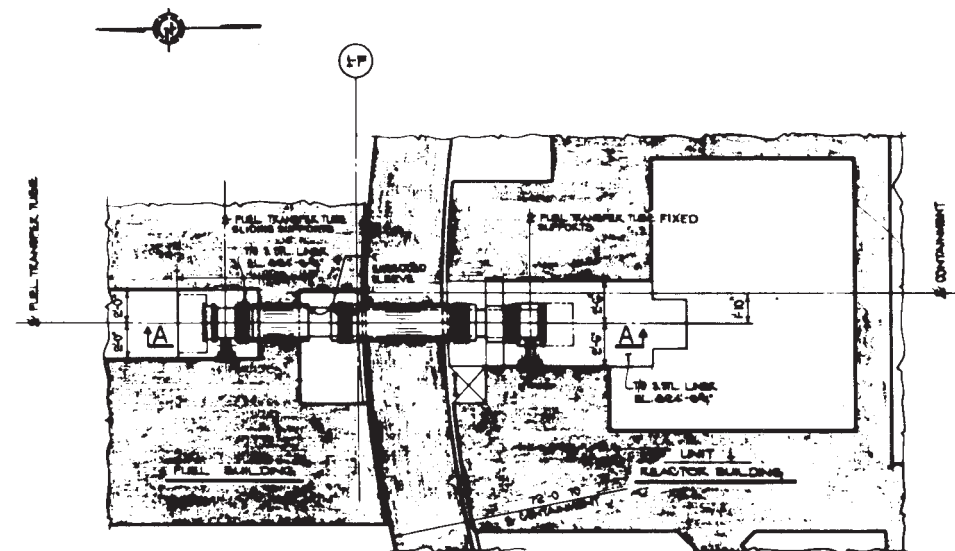
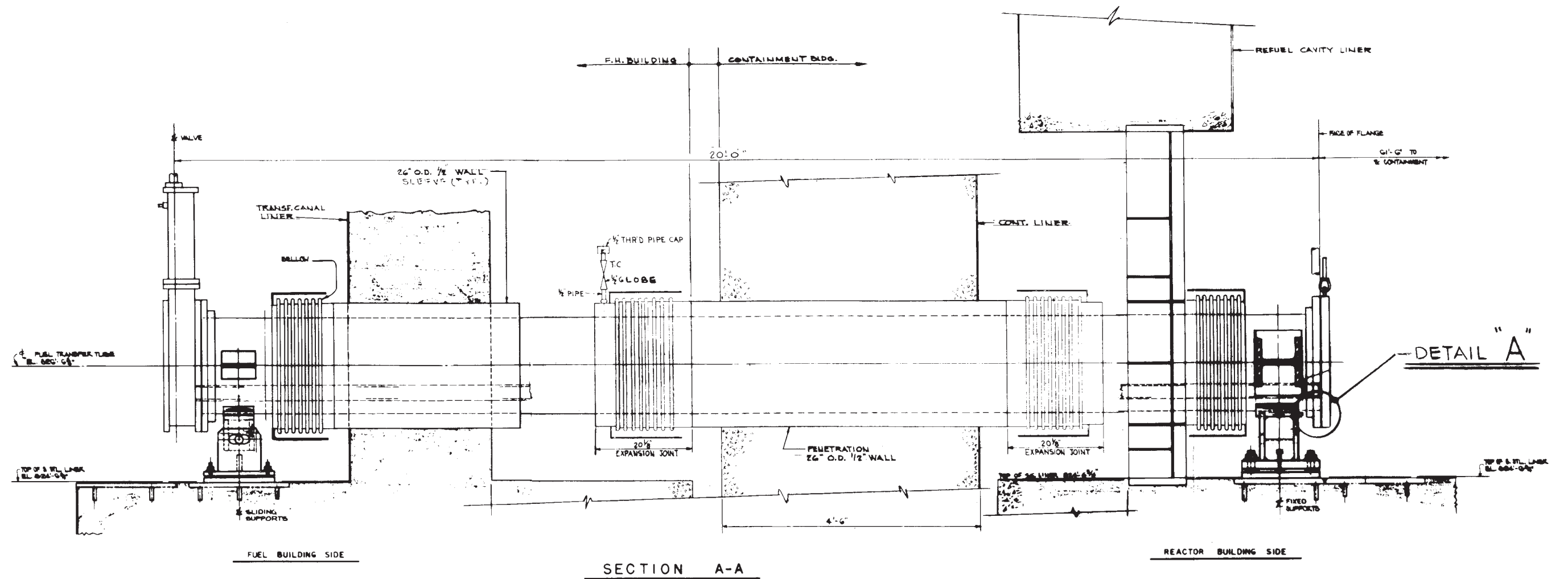
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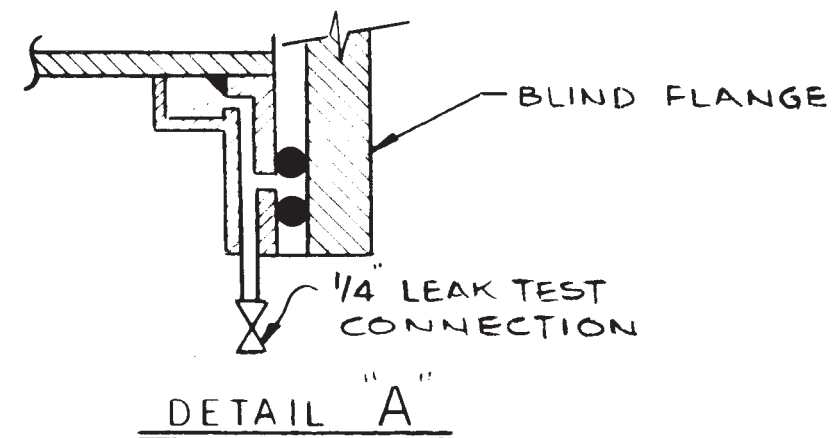
FIGURE 6.2.5A-8  
HAS BEEN DELETED

CPSSES / FSAR  
FIGURE 6.2.5A-9

DELETED



PART PLAN AT EL 826'-6 1/2"  
SCALE 1/4"=1'-0"



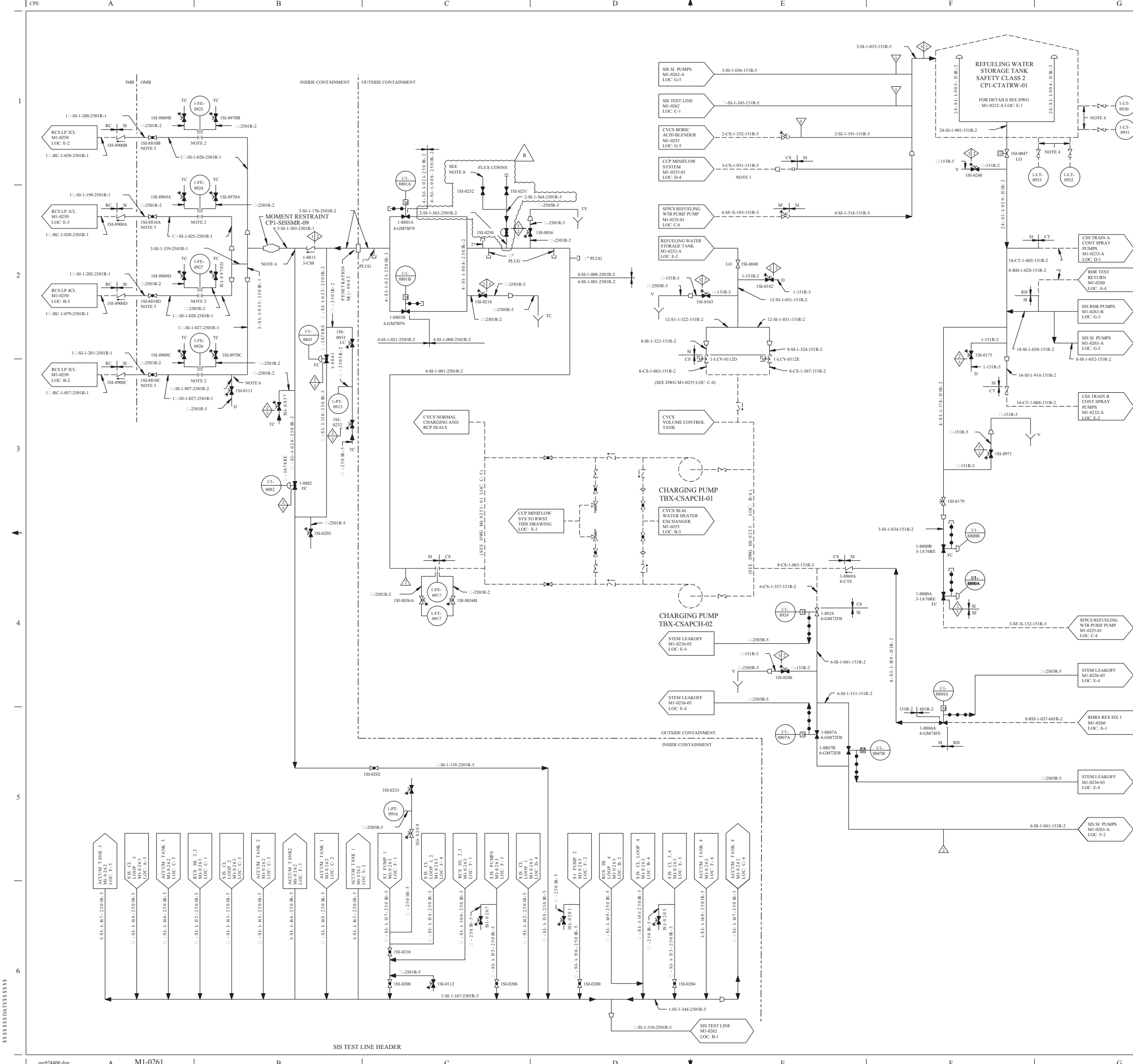
DETAIL "A"

AMENDMENT 13  
DECEMBER 15, 1980

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

FUEL TRANSFER TUBE LEAK  
TEST ARRANGEMENT

FIGURE 6.2.6-1



REV	DATE	BY	CHKD	APPD	REMARKS
7-21	08/20/2014	SKK	SM	SM	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA 2013-000004-05-00 PER SK.005-13-000008-05-00

- NOTES:
1. PIPING FROM THE OUTLET OF THE RELIEF VALVES TO THE FIRST SHALL BE SUPPORTED SUCH THAT THE PRESSURE BOUNDARY WILL REMAIN INTACT AND ALLOW FLOW PATH THROUGH THE LINE FOLLOWING A SAFE SHUTDOWN EARTHQUAKE.
  2. FLANGES FOR FLOW METERING ORIFICE TO VERIFY FLOW DURING PRE-OPERATIONAL TESTING.
  3. INDICATES HERMETICALLY SEALED VALVE.
  4. LOCATE TAPS AT SAME ELEVATION (APPROX 1 FOOT ABOVE BOTTOM OF ROWS). PROVIDE MAXIMUM PHYSICAL SEPARATION BETWEEN EACH TAP LOCATION.
  5. ADJUST AND LOCK VALVES TO LIMIT PUMP RUNOUT.
  6. 1-D FLOW RESTRICTOR PROVIDED PER NOTE 15 ON MECHANICAL SYMBOLS AND NOTES SEE DRAWING M1-0200.
  7. UNLESS OTHERWISE NOTED ALL DRAINS COLLECTED BY LOCAL FLOOR DRAIN SYSTEM.
  8. FLEX CONNECTION - MAY BE A PIPE CAP OR STORZ CONNECTION.

REFERENCE NOTE:  
 THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM WESTINGHOUSE DRAWING 113809 (SI) REV 5 WITH EXCEPTIONS AS FOLLOWS:  
 a. VALVE AND LINE NUMBERS HAVE BEEN ADDED.  
 b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

**CLASS I**  
 (NUCLEAR SAFETY RELATED)  
 SAFETY CLASS 1      SEISMIC CATEGORY      I  
 SAFETY CLASS 2      CLASS IIF  
 SAFETY CLASS 3      ASSOCIATED CIRCUITS

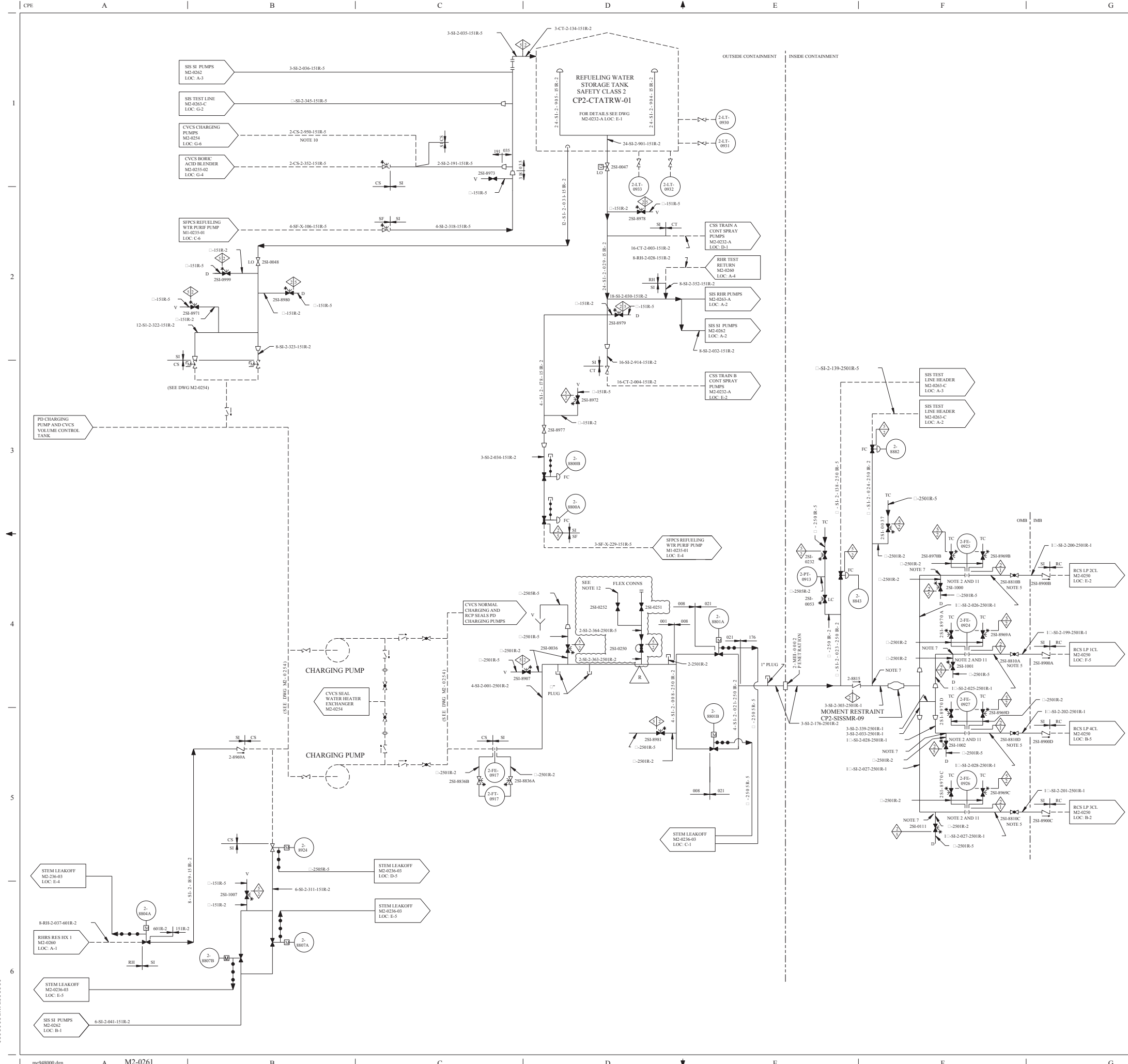
**LUMINANT**  
 CPNPP  
 GLEN ROSE, TEXAS

**FLOW DIAGRAM**  
 SAFETY INJECTION SYSTEM  
 SHEET 1 OF 5

DWG NO. M1-0261	SH NO. -	REV CP-23
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\$\$\$\$\$\$DATTSSSSSS

FSAR FIGURE 6.3-1  
THIS DRAWING CREATED ELECTRONICALLY



REV	DWN	CHKD	APPD	REMARKS
CP-16	DLK 01-15 2014	KRM 06-21 2014		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE: FDX 2011-00006-06-00 PER SR 0002-11-00006-06-00

NOTES:

- DELETED
- FLANGES FOR FLOW METERING ORIFICE TO VERIFY FLOW DURING PRE-OPERATIONAL TESTING.
- SEE DRAWING M1-0200 FOR MECHANICAL SYMBOLS AND NOTES.
- DELETED
- ADJUST AND LOCK VALVES TO LIMIT PUMP RUNOUT.
- DELETED
- 1" ID FLOW RESTRICTOR PROVIDED PER NOTE 15 ON MECHANICAL SYMBOLS AND NOTES. SEE DRAWING M1-0200.
- DELETED
- UNLESS OTHERWISE NOTED ALL DRAINS COLLECTED BY LOCAL FLOOR DRAIN SYSTEM.
- PIPING FROM THE OUTLET OF THE RELIEF VALVES TO THE RWST SHALL BE SUPPORTED SUCH THAT RELIEF VALVE FLOW CAN BE MAINTAINED FOLLOWING A SAFE SHUTDOWN EARTHQUAKE.
- PROVIDE 1" (MAX) ID FLOW RESTRICTOR.
- FLEX CONNECTION - MAY BE A PIPE CAP OR STORZ CONNECTION.

REFERENCE NOTE:

THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM WESTINGHOUSE DRAWING 113808(SI-1) REV 9 WITH EXCEPTIONS AS FOLLOWS:

- VALVE AND LINE NUMBERS HAVE BEEN ADDED.
- CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

R

FSAR FIGURE 6.3-1

THIS DRAWING CREATED ELECTRONICALLY

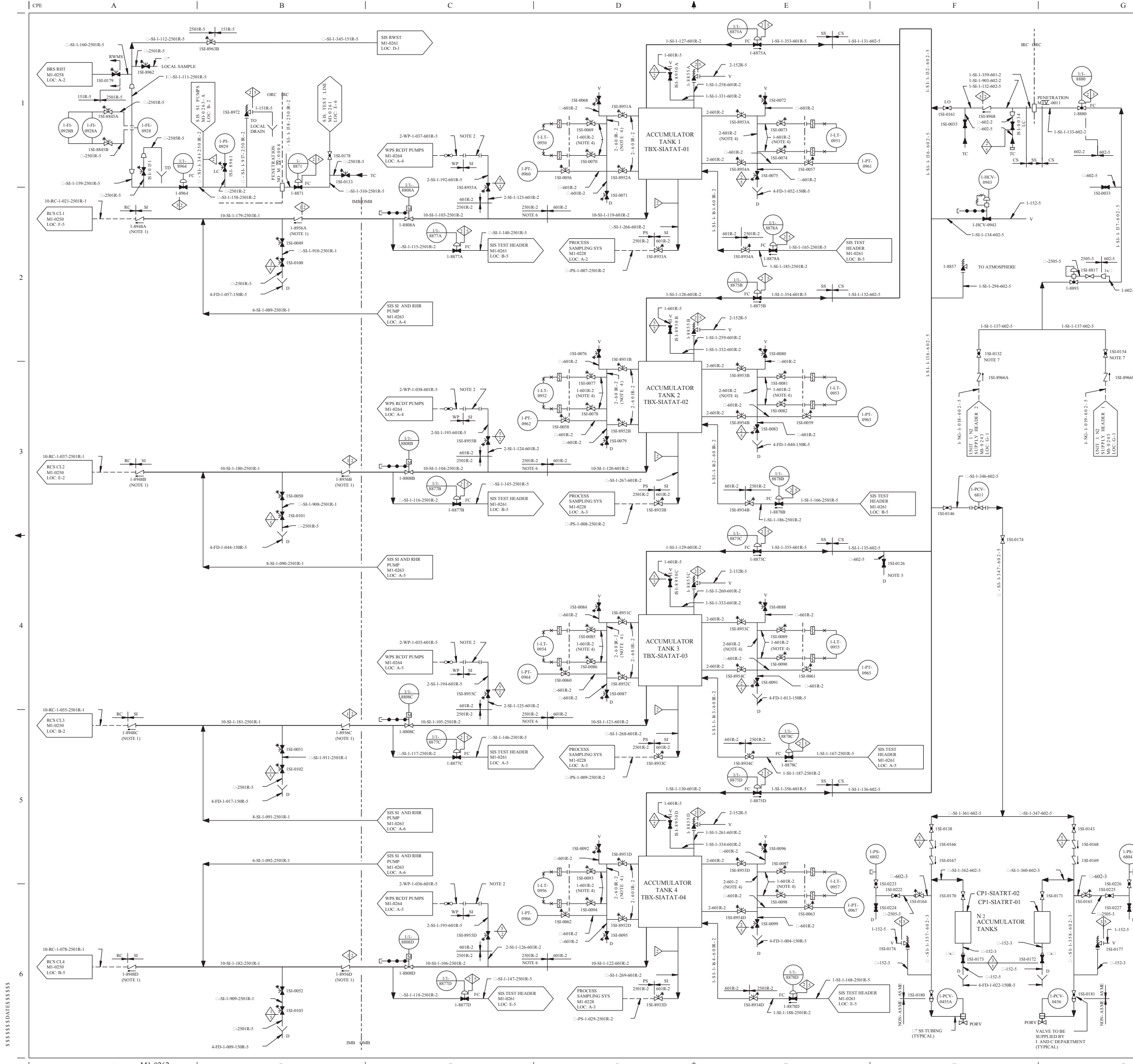
<b>CLASS I</b> (NUCLEAR SAFETY-RELATED)	
SAFETY CLASS 1	SEISMIC CATEGORY 1
SAFETY CLASS 2	CLASS II
SAFETY CLASS 3	ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

FLOW DIAGRAM  
SAFETY INJECTION SYSTEM  
SHEET 1 OF 6

DWG NO. M2-0261	SH NO. -	REV. CP-16
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\$\$\$\$\$ DATES\$\$\$\$\$



REV	CHK	APPV	REMARKS
CP-27	10/08/2011		THIS DRAWING REVISED TO INCORPORATE AL-CKR-2015-00021-1 TO EDITORIALY REVISE THE TITLE BLOCK SHEET NUMBER

- NOTES:
- CHECK VALVES ARE LOCATED AS CLOSE TOGETHER AS POSSIBLE AND AS CLOSE TO THE REACTOR COOLANT PIPE AS POSSIBLE.
  - BLIND FLANGES NORMALLY INSTALLED. SPOOL PIECE TO BE INSTALLED DURING ACCUMULATOR DRAINING ONLY AFTER DEPRESSURIZATION.
  - FOR MECHANICAL SYMBOLS AND NOTES SEE DRAWING M1-0200.
  - 120 INCH STANDPIPE TO BE USED WITH SCRIBE MARK INDICATING NORMAL WATER LEVEL. LEVEL TRANSMITTER TAPS ARE LOCATED 8 INCHES ABOVE AND BELOW SCRIBE MARK.
  - UNLESS OTHERWISE NOTED DRAINS COLLECTED BY LOCAL DRAIN CHANNEL B.
  - PIPING SCHEDULE 140 MUST BE USED TO MEET SAFETY ANALYSIS FLOW REQUIREMENTS.
  - VALVE MAY BE OPEN OR CLOSED DURING NORMAL OPERATIONS.
  - DELETED

REFERENCES:

THE FLOW DIAGRAM HAS BEEN REDRAWN FROM WESTINGHOUSE DRAWING 113B898 (SI 2) REV 5 WITH EXCEPTIONS AS FOLLOWS:

- a. VALVES AND LINE NUMBERS HAVE BEEN ADDED.
- b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

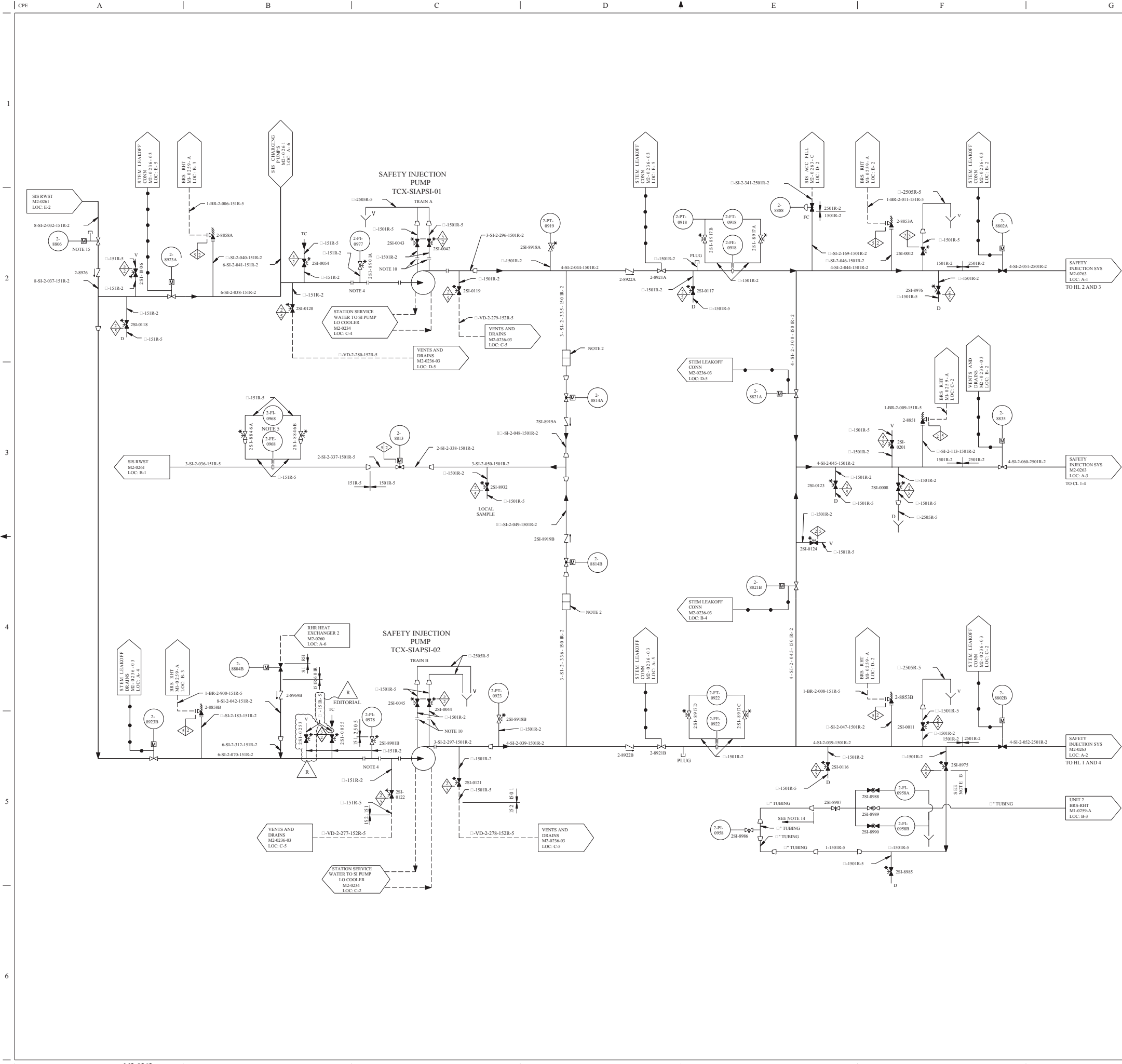
THIS DRAWING CREATED ELECTRONICALLY

**CLASS I**  
(NUCLEAR SAFETY RELATED)

SAFETY CLASS 1      SEISMIC CATEGORY 1  
SAFETY CLASS 2      CLASS 1B ASSOCIATED CIRCUITS  
SAFETY CLASS 3

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

**FLOW DIAGRAM**  
SAFETY INJECTION SYSTEM  
SHEET 2 OF 5



REV	DATE	BY	CHKD	APPD	REMARKS
CP-21	07-06-2003	07-08-2003			THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA 2015-00071-01-00 PER SK-0001-15-00071-01-00. EDITORIAL CHANGE AS NOTED.

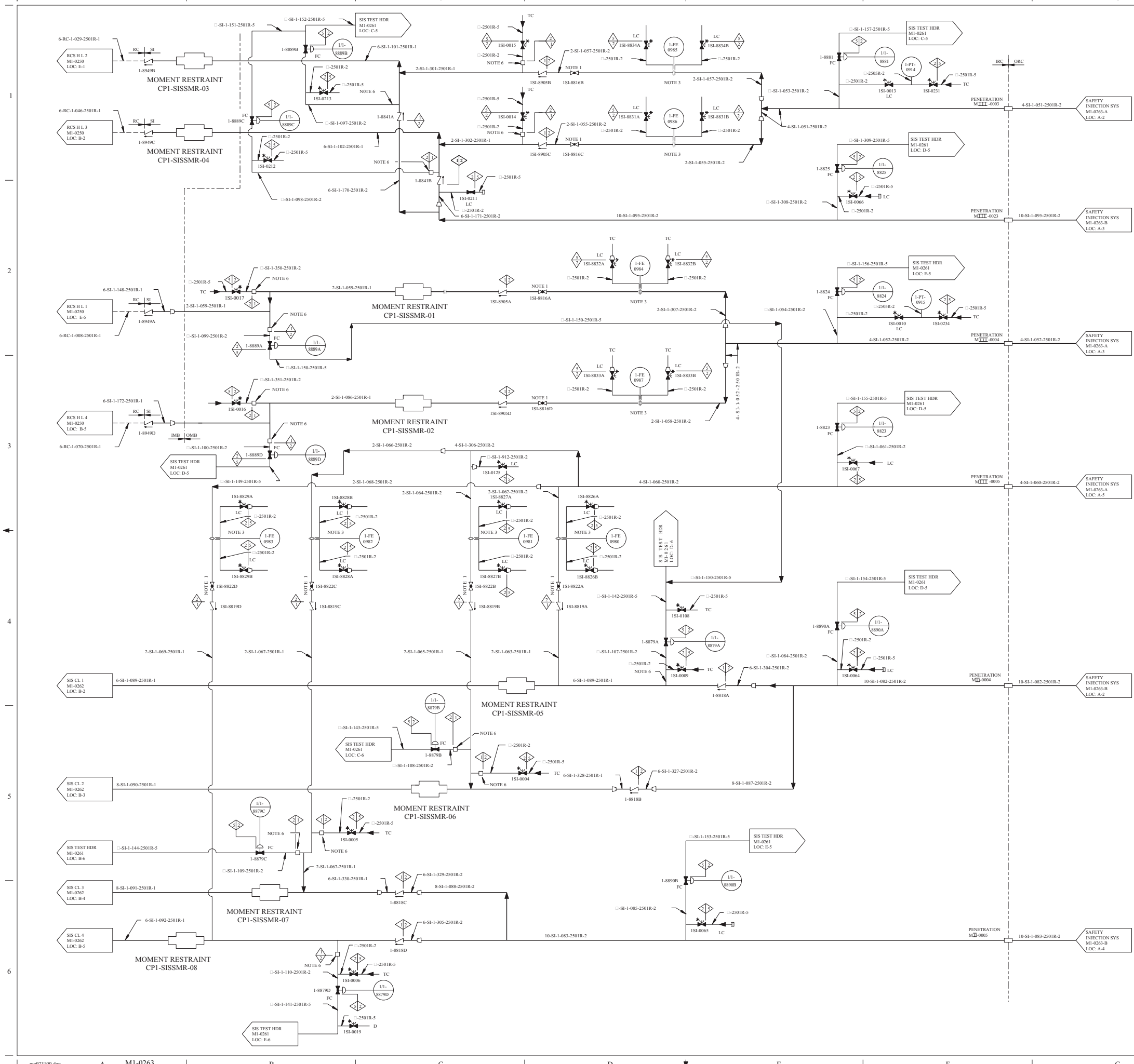
- NOTES
- DELETED
  - REF FDN-142 FOR MINIFLOW ORIFICE PART OF SAFETY INJECTION PUMP BY TCX-SIAPSI-01 AND TCX-SIAPSI-02.
  - DELETED
  - TEMPORARY STRAINERS CP2-SISRTS-01 AND CP2-SISRTS-02 ARE PLACED IN SPOOL PIECES DURING INITIAL FLUSHING OPERATIONS. STRAINERS MUST BE REMOVED BEFORE PLANT START-UP. CAPPED LINE IS CONNECTED TO PRESSURE GAUGE DURING INITIAL FLUSHING.
  - FLOW INDICATOR LOCATED OUTSIDE OF SAFETY INJECTION PUMP ROOMS.
  - DELETED
  - DELETED
  - DELETED
  - DELETED
  - SAFETY INJECTION PUMP CASING VENTS DESIGNED TO HAVE 300 LB FLANGES.
  - UNLESS OTHERWISE NOTED DRAINS COLLECTED BY LOCAL DRAIN SYSTEM.
  - DELETED
  - ALTERNATE RELIEF PATH AND LEAK MEASUREMENT.
  - SPECIAL CASE SEISMIC CATEGORY II (PRESSURE BOUNDARY INTEGRITY) NNS PIPING, TUBING, FITTING AND VALVES ARE ASME III, CLASS 2 MATERIALS UP TO VALVE 2SI-8987.
  - VALVE IS LOCKED OPEN WITH POWER REMOVED AND ARE ADMINISTRATIVELY CONTROLLED.
- REFERENCE NOTE:  
 THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM W DWG 1598 SH 3 REV 9 WITH EXCEPTIONS AS FOLLOWS:  
 a. VALVES AND LINE NUMBERS HAVE BEEN ADDED.  
 b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

FSAR FIGURE 6.3-1  
THIS DRAWING CREATED ELECTRONICALLY

<b>CLASS I</b> (NUCLEAR SAFETY RELATED)	
SAFETY CLASS 1	SEISMIC CATEGORY I
SAFETY CLASS 2	SAFETY CLASS 3
SAFETY CLASS 3	ASSOCIATED CIRCUITS
<b>LUMINANT CPNPP GLEN ROSE, TEXAS</b>	
FLOW DIAGRAM SAFETY INJECTION SYSTEM SHEET 2 OF 6	
DWG NO. M2-0262 SHT -	SH. NO. REV. - CP-21

\$\$\$\$\$DATE\$\$\$\$\$





REV	DATE	BY	CHKD	APPVD	REMARKS
19-17	10/22/2019				THIS DRAWING REVISED TO INCORPORATE AICR-2015-00021-1 TO EDITORIALY ADD THE TITLE BLOCK SHEET NUMBER.

- NOTES:
1. VALVES PROVIDED WITH POSITION LOCKING DEVICE ADJUST AND LOCK VALVES TO LIMIT PUMP RUNOUT.
  2. DELETED
  3. FLOW METERING ORIFICE TO VERIFY FLOW DURING PREOPERATIONAL TESTING
  4. DELETED
  5. DELETED
  6. IN SAFETY CLASS I PIPING, A FLOW RESTRICTION IS REQUIRED IN PIPING TO ALLOW TRANSITION FROM SAFETY CLASS I TO SAFETY CLASS II. TYPICAL FLOW RESTRICTOR SHOWN.
  7. DELETED
  8. DELETED
  9. DELETED
  10. DELETED
  11. UNLESS OTHERWISE NOTED DRAINS COLLECTED BY LOCAL DRAIN SYSTEM
  12. DELETED
  13. FOR GENERAL NOTES AND SYMBOLS SEE DRAWING M1-0260.

REFERENCE NOTE:  
 THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM W DWG 0199B SH 3 REV 5 WITH EXCEPTIONS AS FOLLOWS:  
 a. VALVES AND LINE NUMBERS HAVE BEEN ADDED  
 b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

DRAWING 2223-M1-0263 SH REV CP-9	
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
M1-0263	
M1-0263-A	
M1-0263-B	
M1-0263-C	
M1-0263-D	
M1-0263-E	
M1-0263-F	
M1-0263-G	
M1-0263-H	

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS I SEISMIC CATEGORY I  
 SAFETY CLASS 2 CLASS IIE  
 SAFETY CLASS I ASSOCIATED CIRCUITS

**LUMINANT**  
 CPNPP  
 GLEN ROSE, TEXAS

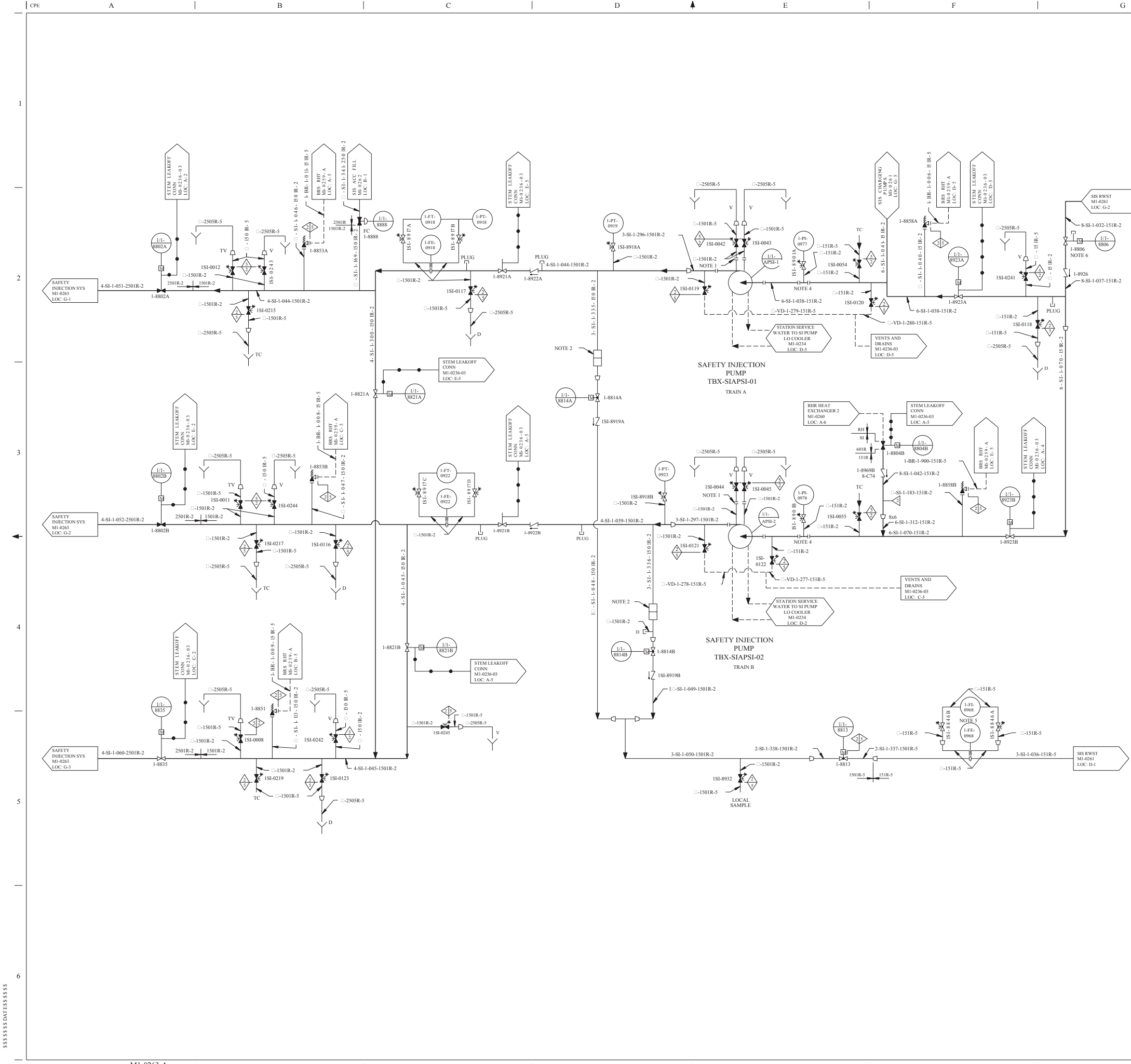
**FLOW DIAGRAM**  
**SAFETY INJECTION SYSTEM**  
 SHEET 3 OF 5

DWG NO: M1-0263 SH NO: - REV: CP-17

FSAR FIGURE 6.3-1

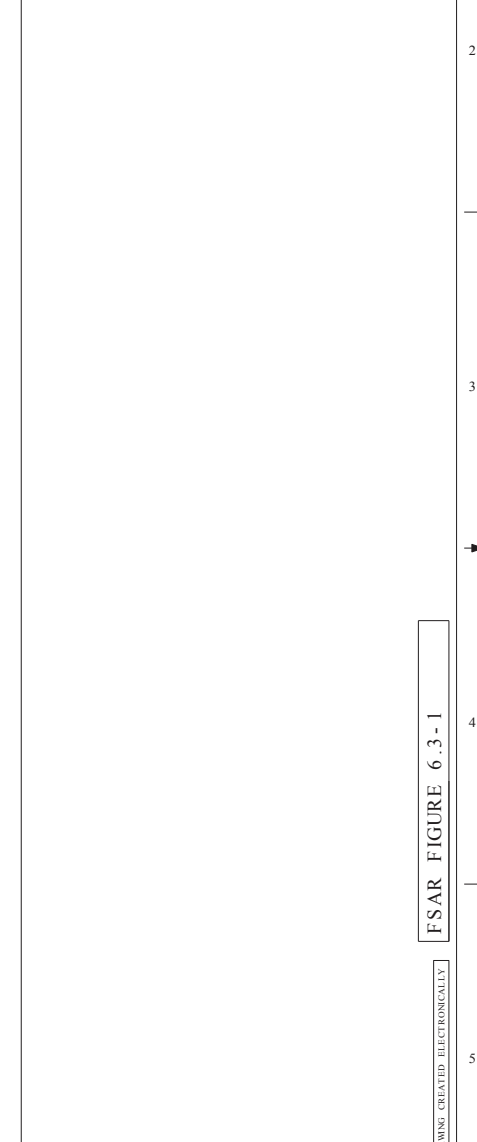
THIS DRAWING CREATED ELECTRONICALLY





REV	OWN	CHK	APPV	REMARKS
CP-20	DK	6612	300	THIS DRAWING REVISION TO INCORPORATE AS-CR-2013-000121-1 TO EDITORIALY ADD THE TITLE BLOCK SHEET NUMBER.

- NOTES:
- SAFETY INJECTION PUMP CASING VENTS DESIGNED □-150IR-2 HAVE 300 LB FLANGES.
  - REF FDN-142 FOR MINIFLOW ORIFICE, PART OF SAFETY INJECTION PUMP BY W ( TBX-SIAPSI-01 AND TBX-SIAPSI-02 )
  - UNLESS OTHERWISE NOTED DRAINS COLLECTED BY LOCAL DRAIN SYSTEM.
  - TEMPORARY STRAINERS CPI-SISRTS-01 AND CPI-SISRTS-02 ARE PLACED IN SPOL PIECES DURING INITIAL FLUSHING OPERATIONS. STRAINER MUST BE REMOVED BEFORE PLANT START-UP. CAPPED LINE IS CONNECTED TO PRESSURE GAUGE DURING INITIAL FLUSHING.
  - FLOW INDICATOR LOCATED OUTSIDE OF SAFETY INJECTION PUMP ROOMS.
  - VALVE IS LOCKED OPEN WITH POWER REMOVED AND ARE ADMINISTRATIVELY CONTROLLED.
  - SEE DRAWING M1-0200 FOR MECHANICAL SYMBOLS AND NOTES.



DRAWING	2123-M1-0263	REV	CP-9
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
M1-0263			
M1-0263-A			
M1-0263-B			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SERVIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

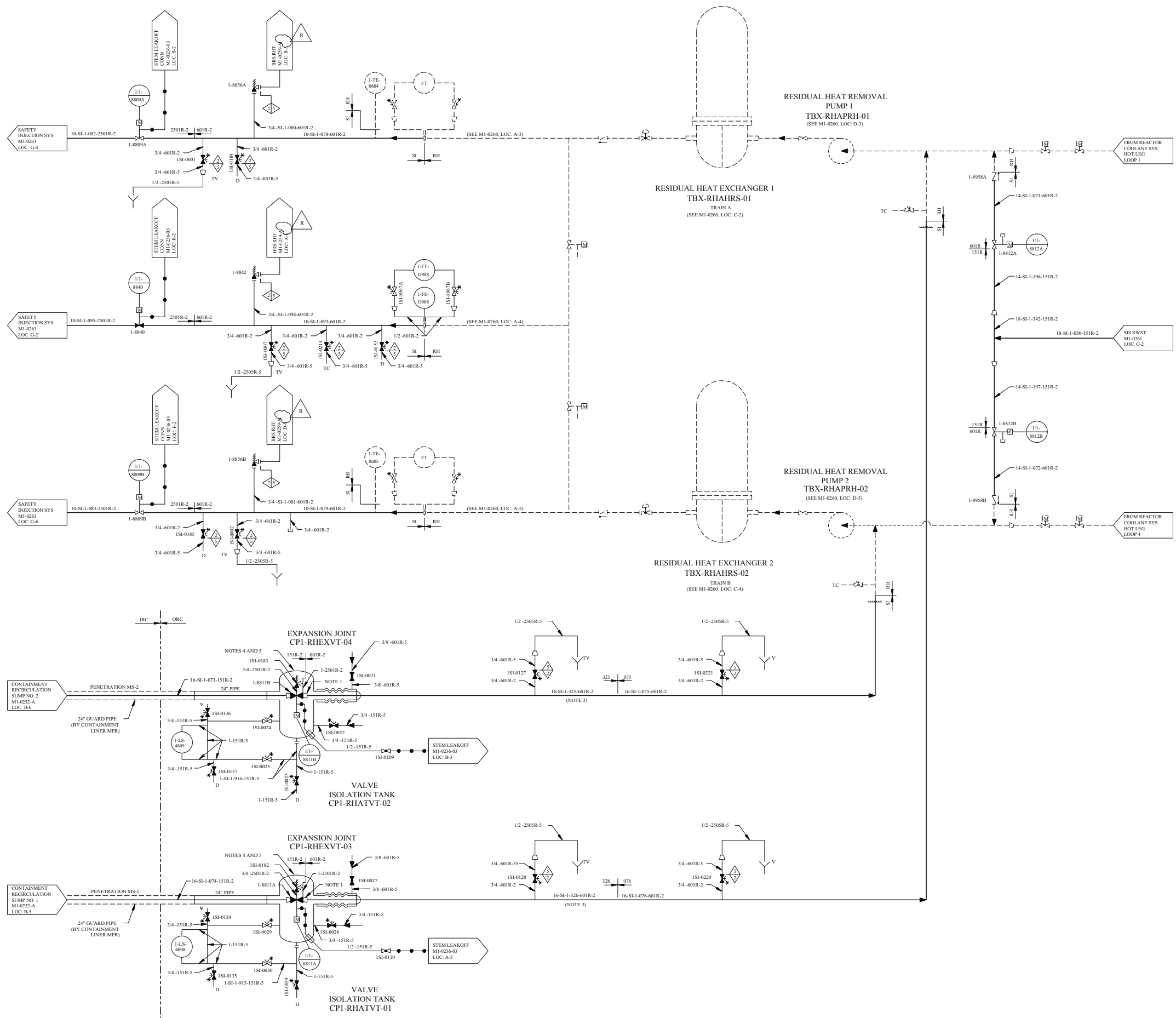
**FLOW DIAGRAM**  
**SAFETY INJECTION SYSTEM**  
SHEET 4 OF 5

DWG. NO.	M1-0263	SH. NO.	A	REV.	CP-20
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\$\$\$\$\$DATE\$\$\$\$\$

FSAR FIGURE 6.3-1

THIS DRAWING CREATIED ELECTRONICALLY



REV	DWN	CHK	APPV'D	REMARKS
CP-14	10-01	10-01	10-01	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE TDA 2009-025161-00 FOR SR-000-09-025161-00 EDITORIAL CHANGE AS NOTED

- NOTES:
- SPECIAL FORGED PIECE 16" SCH 160 PIPE, REF GTN-24629.
  - UNLESS OTHERWISE NOTED, DRAINS CONNECTED BY LOCAL DRAIN SYSTEM.
  - PIPING TO BE 16" SCH 120, SEAMLESS SA-376, TP-304 OR TP-316. FITTINGS TO BE SCH 120, SEAMLESS SA-303, TP-304 OR TP-316.
  - VALVE ISOLATION TANK MAINWAYS PROVIDE AN OPEN VENT PATH THRU THE OPEN MAINWAY.
  - VALVE ISOLATION TANK, EXPANSION JOINT, GUARD PIPE, VENT, DRAIN, VALVE STEM LEAK-OFF PIPING AND RELATED VALVES WERE FABRICATED, TESTED AND INSTALLED TO ANSI SAFETY CLASS 2, ASME CODE CLASS 2 REQUIREMENTS. THESE COMPONENTS AND PIPING HAVE BEEN RECLASSIFIED IN THEIR CURRENT APPLICATION TO NON-NUCLEAR SAFETY (NNS) SEISMIC CATEGORY II (FOR STRUCTURAL INTEGRITY AND ENHANCED LEAK DETECTION). THE ASME CODE CLASSIFICATION NEED NOT BE MAINTAINED AND, THEREFORE, WORK NEED NOT BE PERFORMED TO ASME XI REQUIREMENTS.
  - SEE DRAWING M1-0260 FOR MECHANICAL SYMBOLS AND NOTES.

R  
EDITORIAL

FROM REACTOR COOLANT SYS HOT LEG LOOP 1

18-SI-1-030-151R-2

SIS RWST M1-0261 LOC. G-2

FROM REACTOR COOLANT SYS HOT LEG LOOP 4

18-SI-1-072-601R-2

FROM REACTOR COOLANT SYS HOT LEG LOOP 4

18-SI-1-076-601R-2

FROM REACTOR COOLANT SYS HOT LEG LOOP 4

18-SI-1-076-601R-2

FROM REACTOR COOLANT SYS HOT LEG LOOP 4

18-SI-1-076-601R-2

DRAWING	2323-M1-0263	REV	CP-9
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
M1-0263			
M1-0263-A			
M1-0263-B			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

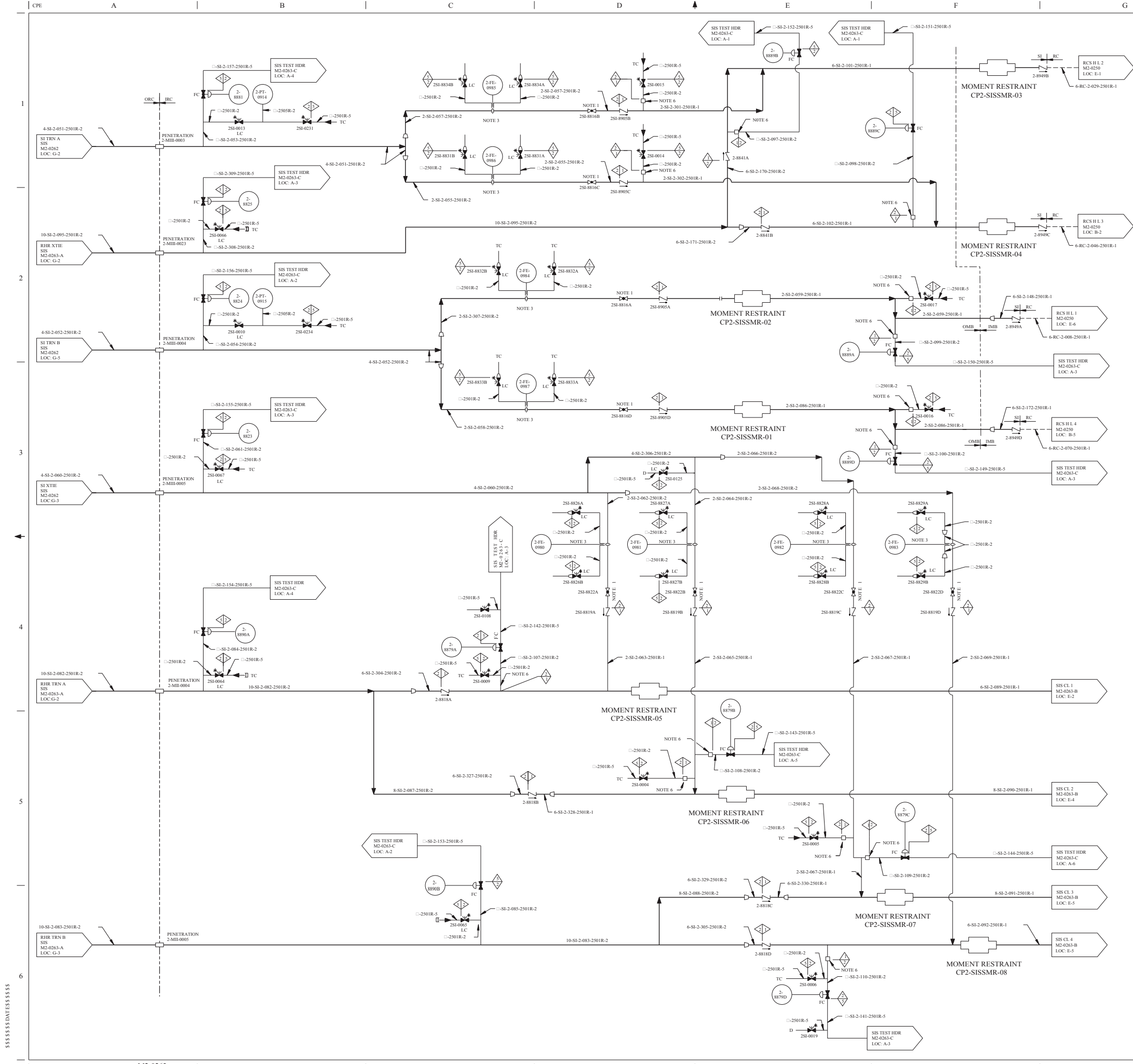
**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

FLOW DIAGRAM  
SAFETY INJECTION SYSTEM  
SHEET 5 OF 5

DWG NO.	M1-0263	SH. NO.	B	REV.	CP-14
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FSAR FIGURE 6.3-1

THIS DRAWING CREATED ELECTRONICALLY



REV	OWN	CHKD	APPD	REMARKS
CP-17	DLK	DLK	DLK	THIS DRAWING REVISED TO INCORPORATE ALCR 2015-000121-4 TO EDITORIALY ADD THE TITLE BLOCK SHEET NUMBER.

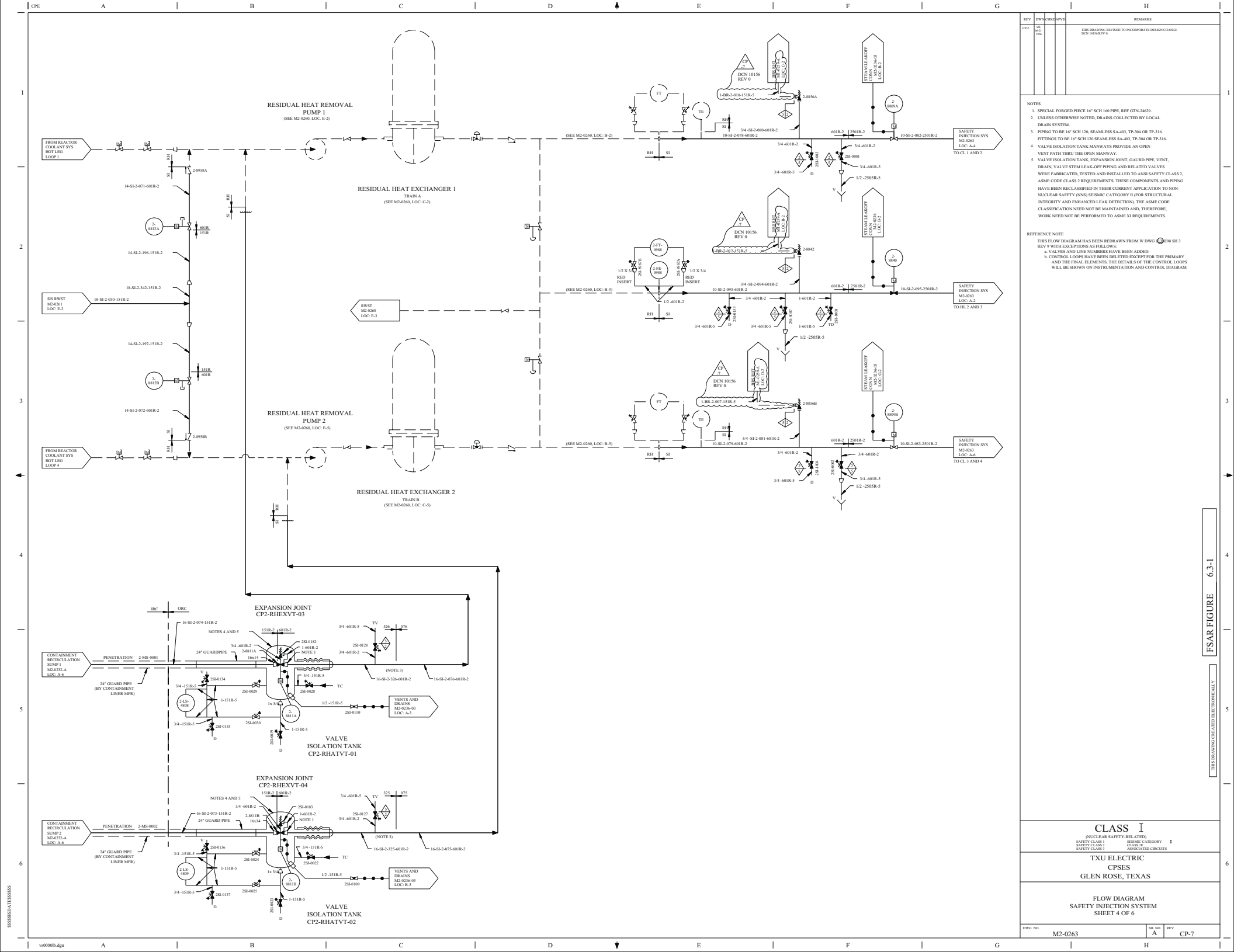
- NOTES:
1. VALVES PROVIDED WITH POSITION LOCKING DEVICE ADJUST AND LOCK VALVES TO LIMIT PUMP RUNOUT.
  2. DELETED
  3. FLOW METERING ORIFICE TO VERIFY FLOW DURING PREOPERATIONAL TESTING.
  4. DELETED
  5. DELETED
  6. IN SAFETY CLASS 1 PIPING A FLOW RESTRICTION IS REQUIRED IN " PIPING TO ALLOW TRANSITION FROM SAFETY CLASS 1 TO SAFETY CLASS 2. TYPICAL FLOW RESTRICTOR SHOWN.
  7. FOR MECHANICAL SYMBOLS AND NOTES SEE M1-0200.
  8. DELETED
  9. DELETED
  10. UNLESS OTHERWISE NOTED, DRAINS COLLECTED BY LOCAL DRAIN SYSTEM.
  11. DELETED

REFERENCE NOTE:  
 THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM DWG 098 SSI 3 REV 9 WITH EXCEPTIONS AS FOLLOWS:  
 a. VALVES AND LINE NUMBERS HAVE BEEN ADDED.  
 b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOGS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

FSAR FIGURE 6.3-1

THIS DRAWING CREATED ELECTRONICALLY

<b>CLASS I</b> (NUCLEAR SAFETY-RELATED) SAFETY CLASS I SEISMIC CATEGORY SAFETY CLASS 2 CLASS 1E SAFETY CLASS 3 ASSOCIATED CIRCUITS		<b>I</b>
<b>LUMINANT</b> <b>CPNPP</b> <b>GLEN ROSE, TEXAS</b>		
<b>FLOW DIAGRAM</b> <b>SAFETY INJECTION SYSTEM</b> <b>SHEET 3 OF 6</b>		
DWG. NO. M2-0263	SH. NO. -	REV. CP-17



REV	DATE	BY	CHK	APPV	REMARKS

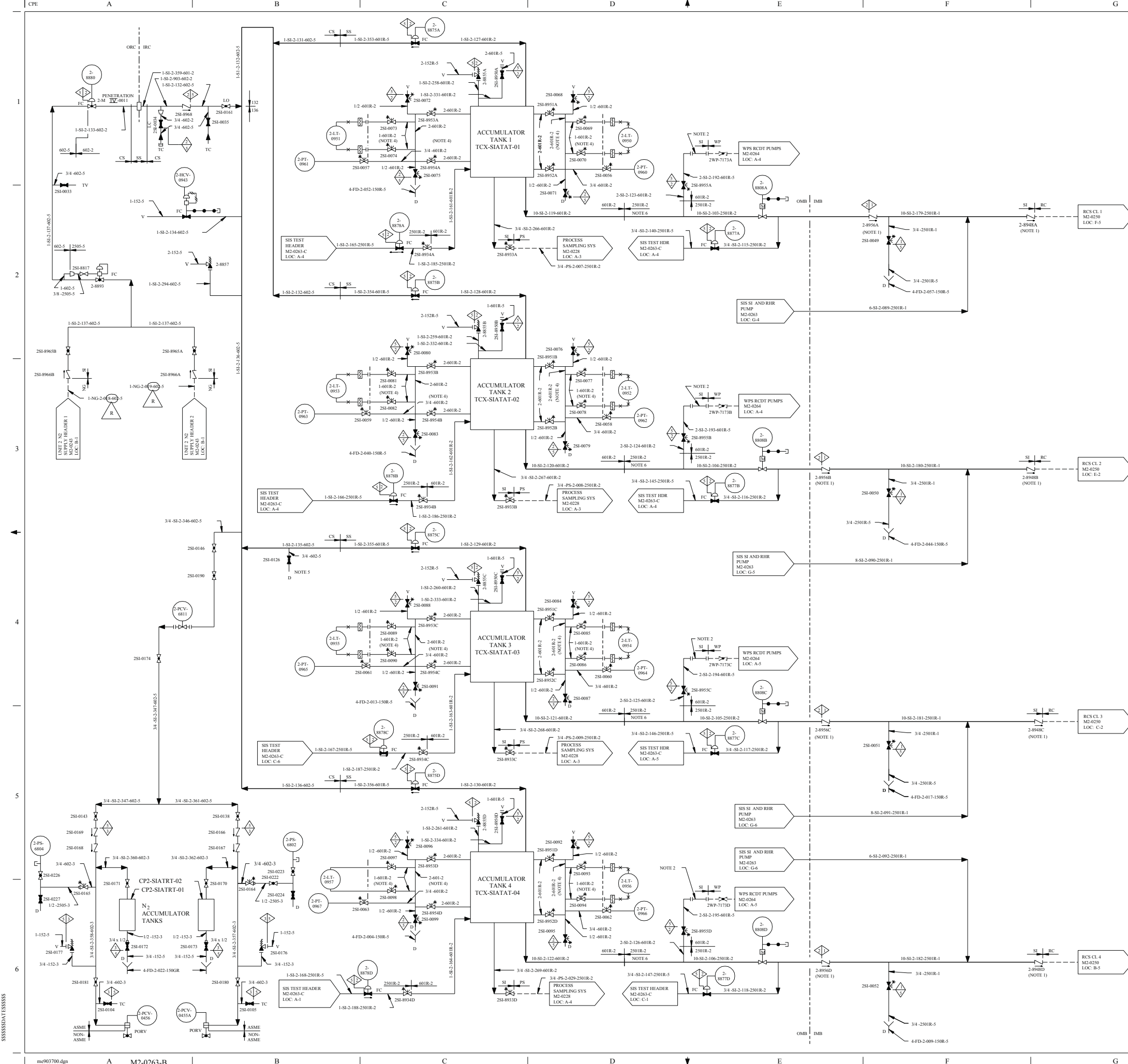
- NOTES
- SPECIAL FORGED PIECE 10" SCH 160 PIPE, REF GTN-34269.
  - UNLESS OTHERWISE NOTED, DRAINS COLLECTED BY LOCAL DRAIN SYSTEM.
  - PIPING TO BE 10" SCH 120, SEAMLESS SA-403, TP-34 OR TP-34; FITTINGS TO BE 10" SCH 120 SEAMLESS SA-403, TP-34 OR TP-34.
  - VALVE ISOLATION TANK MANWAYS PROVIDE AN OPEN VENT PATH THRU THE OPEN MANWAY.
  - VALVE ISOLATION TANK, EXPANSION JOINT, GAUGE PIPE, VENT, DRAIN, VALVE STEM LEAK-OFF PIPING AND RELATED VALVES WERE FABRICATED, TESTED AND INSTALLED TO ANSI SAFETY CLASS 2. ASME CODE CLASS 2 REQUIREMENTS. THESE COMPONENTS AND PIPING HAVE BEEN RECLASSIFIED IN THEIR CURRENT APPLICATION TO NON-NUCLEAR SAFETY (NON-REACTOR) CATEGORY II FOR STRUCTURAL INTEGRITY AND ENHANCED LEAK DETECTIONS. THE ASME CODE CLASSIFICATION NEED NOT BE MAINTAINED AND, THEREFORE, WORK NEED NOT BE PERFORMED TO ASME XI REQUIREMENTS.

REFERENCE NOTE  
 THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM W DWG CP-3813 REV 9 WITH EXCEPTIONS AS FOLLOWS:  
 a. VALVES AND LINE NUMBERS HAVE BEEN ADDED.  
 b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1      DESIGN CATEGORY I  
 SAFETY CLASS 2      CLASS CATEGORY I  
 SAFETY CLASS 3      ASSOCIATED CATEGORY I

**TXU ELECTRIC**  
**CPSES**  
**GLEN ROSE, TEXAS**

**FLOW DIAGRAM**  
**SAFETY INJECTION SYSTEM**  
**SHEET 4 OF 6**



REV	DATE	BY	CHKD	APPD	REMARKS
CP-13	08/27/2008	08/27/2008			THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA 2008-062277-01-00 PER SR-0001-08-062277-01-00.

- NOTES
- CHECK VALVES ARE LOCATED AS CLOSE TOGETHER AS POSSIBLE AND AS CLOSE TO THE REACTOR COOLANT PIPE AS POSSIBLE.
  - BLIND FLANGES NORMALLY INSTALLED. SPOOL PIECE TO BE INSTALLED DURING ACCUMULATOR DRAINING ONLY AFTER DEPRESSURIZATION.
  - FOR MECHANICAL SYMBOLS AND NOTES SEE DRAWING M1-0200.
  - 120 INCH STANDPIPE TO BE USED WITH SCRIBE MARK INDICATING NORMAL WATER LEVEL. LEVEL TRANSMITTER TAPS ARE LOCATED 8 INCHES ABOVE AND BELOW SCRIBE MARK.
  - UNLESS OTHERWISE NOTED, DRAINS COLLECTED BY LOCAL DRAIN CHANNEL B.
  - PIPING SCHEDULE 140 MUST BE USED TO MEET SAFETY ANALYSIS FLOW REQUIREMENTS.

REFERENCE NOTE:  
 THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM DWG M2-0263-01-00 REV 9 WITH EXCEPTIONS AS FOLLOWS:  
 a. VALVES AND LINE NUMBERS HAVE BEEN ADDED.  
 b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.

**CLASS I**  
 (NUCLEAR SAFETY RELATED)  
 SAFETY CLASS 1 SEISMIC CATEGORY 1  
 SAFETY CLASS 2 SEISMIC CATEGORY 1  
 SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT  
 CPNPP  
 GLEN ROSE, TEXAS**

**FLOW DIAGRAM  
 SAFETY INJECTION SYSTEM  
 SHEET 5 OF 6**

DRG NO. M2-0263	SI NO. B	REV. CP-13
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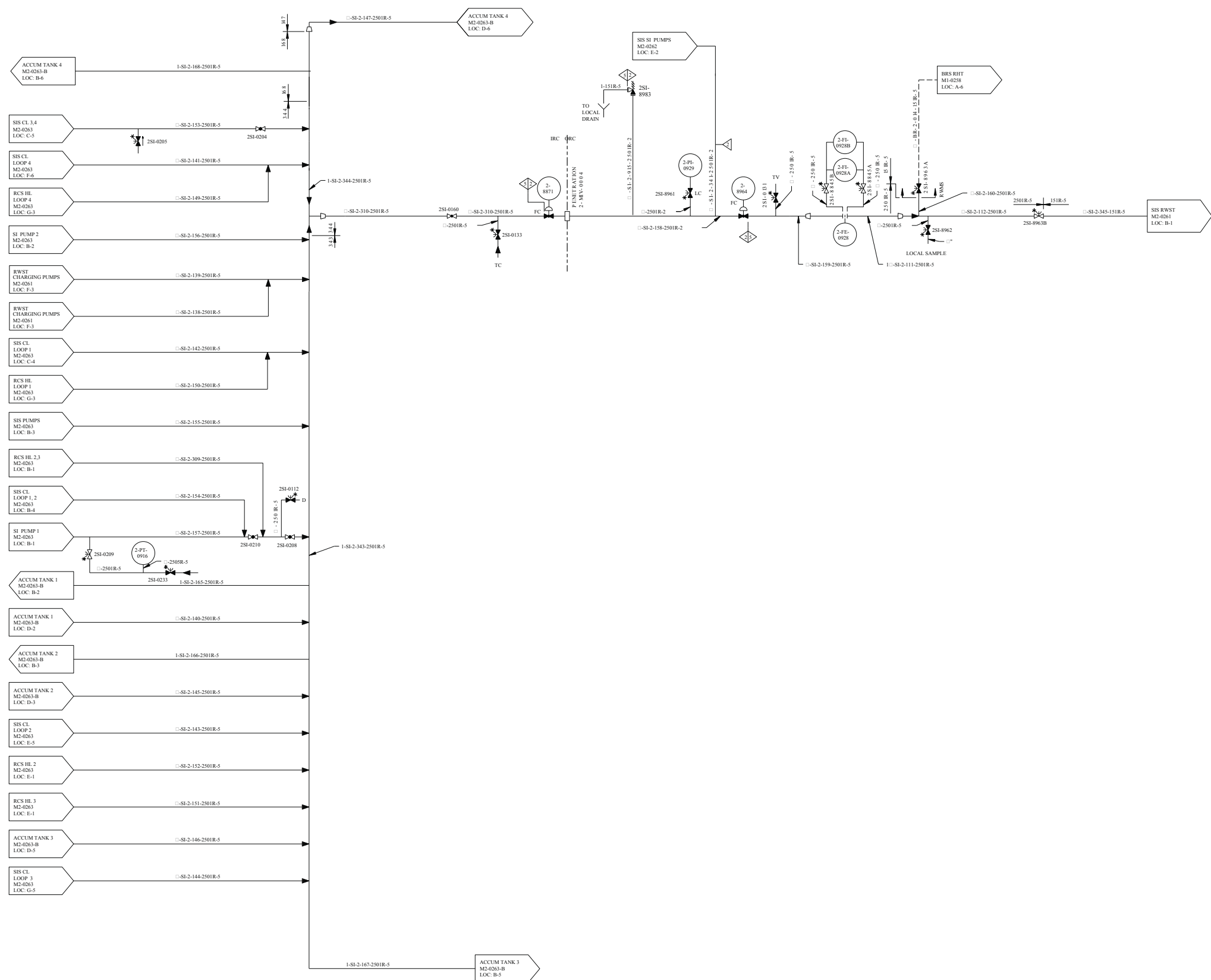
FSAR FIGURE 6.3-1

THIS DRAWING CREATED ELECTRONICALLY

REV	DWN	CHKD	APPD	REMARKS
CP-7	TRA	10-06	2011	THIS DRAWING REVISED TO EDITORIALY CORRECT (ADD) FSAR NUMBER TO THIS DRAWING PER AICR-SIC-00296-1.

NOTES:  
 1. SEE M1-0200 FOR MECHANICAL SYMBOLS AND NOTES.  
 2. UNLESS OTHERWISE NOTED ALL DRAINS COLLECTED BY LOCAL FLOOR DRAIN SYSTEM.

REFERENCE:  
 THIS FLOW DIAGRAM HAS BEEN REDRAWN FROM WESTINGHOUSE DRAWING 113E98(SH) REV 9 WITH EXCEPTION AS FOLLOWS:  
 a. VALVE AND LINE NUMBERS HAVE BEEN ADDED.  
 b. CONTROL LOOPS HAVE BEEN DELETED EXCEPT FOR THE PRIMARY AND THE FINAL ELEMENTS. THE DETAILS OF THE CONTROL LOOPS WILL BE SHOWN ON INSTRUMENTATION AND CONTROL DIAGRAM.



FSAR FIGURE 6.3-1

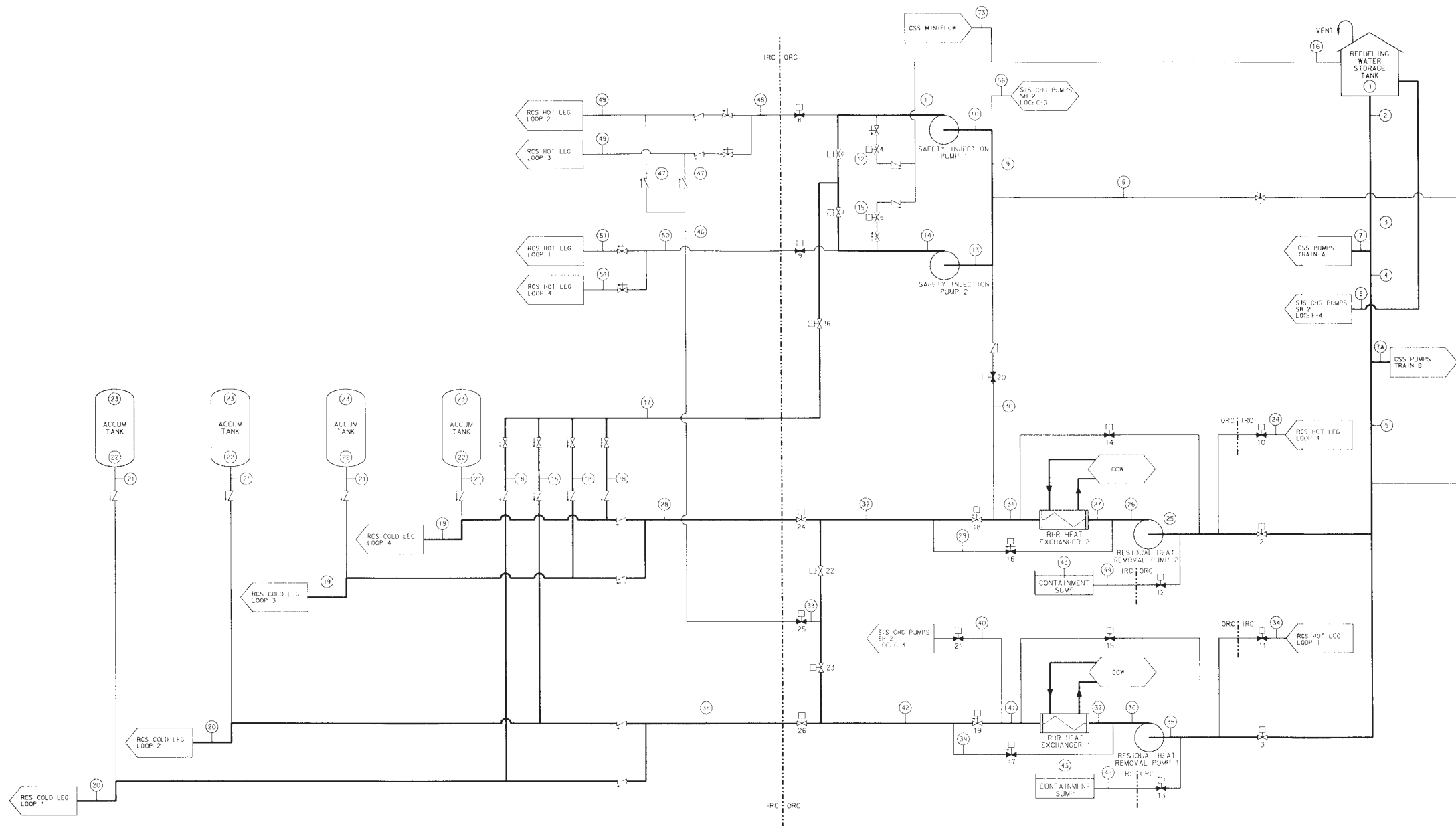
THIS DRAWING CREATED ELECTRONICALLY

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1 SEISMIC CATEGORY I  
 SAFETY CLASS 2 CLASS II  
 SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
 CPNPP  
 GLEN ROSE, TEXAS

**FLOW DIAGRAM**  
 SAFETY INJECTION SYSTEM  
 SHEET 6 OF 6

DWG. NO. M2-0263	SH. NO. C	REV. CP-7
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FOR CORRELATION BETWEEN FLOW DIAGRAM  
NUMBERS AND FSAR FIGURE NUMBERS,  
REFER TO TABLE 3.2-3.

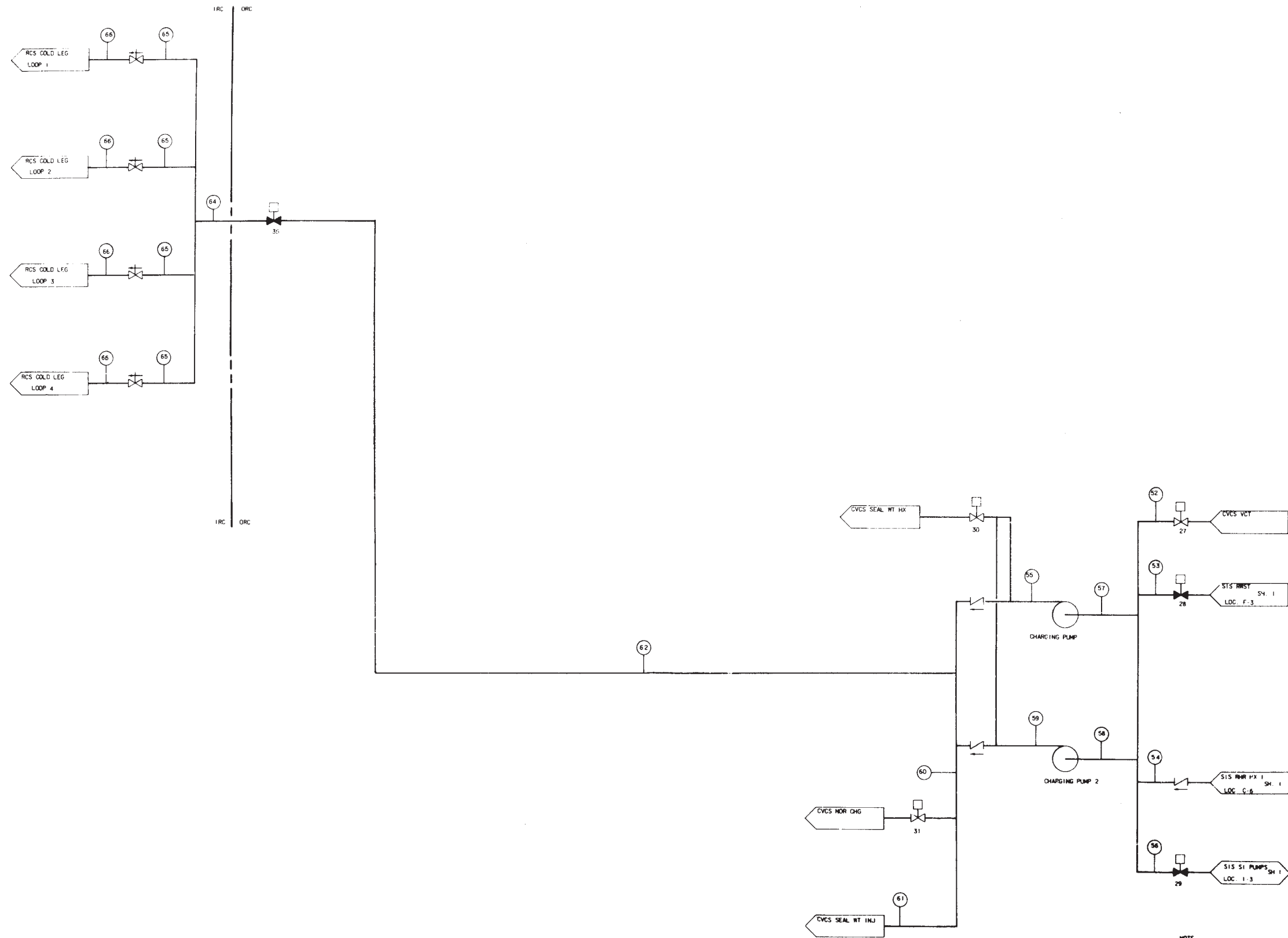
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

SAFETY INJECTION/RESIDUAL  
HEAT REMOVAL SYSTEM  
PROCESS FLOW DIAGRAM

AMENDMENT 78  
JANUARY 15, 1980

6.3-2, SH 1





NOTE  
 1. THIS DIAGRAM IS A SIMPLIFICATION OF THE SYSTEM INTENDED TO FACILITATE THE UNDERSTANDING OF THE PROCESS. FOR DETAILS OF THE PIPING, VALVES, INSTRUMENTATION, ETC. REFER TO THE ENGINEERING FLOOR DIAGRAM. REFER TO PROCESS FLOW DIAGRAM TABLES FOR THE CONDITIONS AT EACH NUMBERED POINT.

AMENDMENT 16  
 MARCH 31, 1981

<p>COMANCHE PEAK S.E.S.          FINAL SAFETY ANALYSIS REPORT          UNITS 1 and 2</p>
<p>Safety Injection/Residual          Heat Removal System          Process Flow Diagram</p>
<p>FIGURE 6.3-2, Sheet 2</p>



MODES OF OPERATION

Mode A – Injection

This mode presents the process conditions for the case of maximum safeguards, i.e., all pumps operating, following accumulator delivery. Two residual heat removal (RHR) pumps, two safety injection (SI) pumps, and two centrifugal charging (CC) pumps operate, taking suction from the refueling water storage tank and delivering to the reactor through the cold leg connections. Note that the flow from each pump is less than its maximum runout since the pump discharge piping is shared by the two pumps of each subsystem. Note also that the SI pump branch connections to the residual lines are assumed very close to their discharge into the accumulator lines, thereby eliminating any increase in RHR branch line head loss due to the combined flows of the RHR and SI pumps. The RHR line resistance was assumed to be the minimum of the allowable band presented in the limiting pressure drop and elevation head design requirements, allowing maximum RHR injection flow.

Mode B – Cold Leg Recirculation

This mode presents the process conditions for the case of cold leg recirculation assuming RHR pump number 2 operating, SI pumps numbers 1 and 2 operating, and CC pumps numbers 1 and 2 operating.

In this mode the safeguards pumps operate in series, with only the RHR pump capable of taking suction from the containment sump. The recirculation coolant is then delivered by the RHR pump to both of the SI pumps

Which deliver to the reactor through their cold leg connections and to both of the CC pumps which deliver to the reactor through their cold leg connections. The RHR pump also delivers flow directly to the reactor through two cold legs since the RHR discharge cross connect valves are closed when making the transfer from injection to recirculation.

#### Mode C – Hot Leg Recirculation

This mode presents the process conditions for the case of hot leg recirculation, assuming RHR pump number 1 operating, CC pumps numbers 1 and 2 operating, and SI pumps numbers 1 and 2 operating.

In this mode, the safeguards pumps again operate in series with only the RHR pump taking suction from the containment sump. The recirculated coolant is then delivered by the RHR pump to both of the CC pumps which continue to deliver to the reactor through their cold leg connections and to both of the SI pumps which deliver to the reactor through their hot leg connections. The RHR pump also delivers directly to the reactor through two hot leg connections.

VALVE ALIGNMENT CHART

Operational Modes

<u>Valve No.</u>	<u>A</u>	<u>B</u>	<u>C</u>
1	O	C	C
2	O	C	C
3	O	C	C
4	O	C	C
5	O	C	C
6	O	O	O*
7	O	O	C*
8	C	C	O
9	C	C	O
10	C	C	C
11	C	C	C
12	C	O	O
13	C	O	O
14	C	C	C
15	C	C	C
16	C	C	C
17	C	C	C
18	O	O	O
19	O	O	O
20	C	O	O
21	C	O	O
22	O	C	O
23	O	C	O
24	O	O	C
25	C	C	O

O = OPEN

C = CLOSED

\* During Mode C one valve to remain open – one closed, no preference, between valves 6 & 7.

VALVE ALIGNMENT CHART (Cont' d)

<u>Valve No.</u>	<u>Operational Modes</u>		
	<u>A</u>	<u>B</u>	<u>C</u>
26	O	O	C
27	C	C	C
28	O	C	C
29	C	O	O
30	C	C	C
31	C	C	C
35	O	O	O
36	O	O	C

NOTES TO FIGURE 6.3-2

(Sheet 5 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow (gpm)**</u>	<u>(lb/sec)</u>	<u>Volume (gal)</u>
1	Refueling water	Atm tank	100	-	-	450,000
2	"	a	100	21,304	2,283	-
3	"	13 psia	100	21,304	2,166	-
4	"	-	100	15,504	1,338	-
5	"	-	100	9.704	1,222	-
6	"	11 psia	100	848	117	-
7 and 7a	"	-	100	5,800 each	Total to CSS	-
8	"	>10 psia	100	839	116	-
9	"	>10 psia	100	424	58.5	-
10	"	10 psia	100	424	58.5	-
11	"	1165	100	424	58.5	-
12	"	>25	100	26	4	-
13	"	10 psia	100	424	58.5	-
14	"	1165	100	424	58.5	-
15	"	<25	100	26	4	-
16	"	-	100	252	35	-
17	"	1050	100	796	110	-
18	"	73	100	199	27	-
19	"	-	100	2,413	333	-
20	"	-	100	2,413	333	-
21	Nitrogen	0	100	0	0	-

NOTES TO FIGURE 6.3-2

(Sheet 6 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure</u> <u>(psig)***</u>	<u>Temperature</u> <u>(°F)</u>	<u>Flow</u> <u>(gpm)**</u>	<u>(lb/sec)</u>	<u>Volume</u> <u>(gal)</u>
22	Nitrogen	0	100	0	0	850****
23	"	0	100	0	0	500
24	Reactor coolant	-	100	0	0	-
25	Refueling water	0	100	4428	611	-
26	"	138	100	4428	611	-
27	"	-	100	4428	611	-
28	"	47	100	4428	611	-
29	"	86	100	0	0	-
30	"	-	100	0	0	-
31	"	-	100	4428	611	-
35	Refueling water	0	100	4428	611	-
36	"	138	100	4428	611	-
37	"	-	100	4428	611	-
38	"	47	100	4428	611	-
39	"	86	100	0	0	-
40	"	-	100	0	0	-
41	"	-	100	0	0	-
42	"	86	100	4428	611	-

NOTES TO FIGURE 6.3-2

(Sheet 7 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow</u>		<u>Volume (gal)</u>
				<u>(gpm)**</u>	<u>(lb/sec)</u>	
43	Recirc. coolant	Containment pressure	120	0	0	-
44	"	"	"	0	0	-
45	"	"	"	0	0	-
46	Refueling water	Low pressure	100	0	0	-
47	"	"	"	0	0	-
48	"	"	"	0	0	-
49	"	"	"	0	0	-
50	"	"	"	0	0	-
51	"	"	"	0	0	-
52	"	-	"	0	0	-
53	"	>10 psia	"	839	116	-
54	"	-	"	0	0	-
55	"	1519	"	419	58	-
56	"	-	"	0	0	-
57	"	10 psia	"	419	58	-
58	"	10 psia	"	419	58	-
59	"	1519	"	419	58	-
60	"	1516	"	124	17	-
61	"	0	"	124	17	-
62	"	1456	"	714	99	-
64	Refueling water	1396	100	714	99	-
65	"	1008	100	178.5	24.6	-
66	"	388	100	178.5	24.6	-

NOTES TO FIGURE 6.3-2

(Sheet 8 of 16)

<u>Location</u>	<u>Fluid</u>	Pressure <u>(psig)***</u>	Temperature <u>(°F)</u>	Flow <u>(gpm)**</u>	<u>(lb/sec)</u>	Volume <u>(gal)</u>
73	Refueling	-	100	200	27.6	-



NOTES TO FIGURE 6.3-2

(Sheet 9 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow#</u>		<u>Volume (gal)</u>
				<u>(gpm)</u>	<u>(lb/sec)</u>	
1	Refueling water	Atm tank	100	-	-	<5000
2	“	-	100	0	0	-
3	“	-	100	0	0	-
4	“	-	100	0	0	-
5	“	-	100	0	0	-
6	Recirc. coolant	-	182	0	0	-
7	Refueling water	-	100	0	0	-
8	“	-	100	0	0	-
9	Recirc. water	35	182	1262	56	-
10	“	35	182	424	56	-
11	“	1165	182	424	56	-
12	Refueling water	-	100	0	0	-
13	Recirc. coolant	35	182	424	56	-
14	“	1165	182	424	56	-
15	Refueling water	-	100	0	0	-
16	“	-	100	0	0	-
17	Recirc. coolant	1050	182	848	106	-
18	“	73	182	199	26	-
19	“	-	182	2006	267	-
20	“	-	182	199	26	-
21	Nitrogen	0	Ambient	0	0	-

NOTES TO FIGURE 6.3-2

(Sheet 10 of 16)

MODE B - COLD LEG RECIRCULATION (PUMP NUMBER 2 OPERATING)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow#</u>		<u>Volume (gal)</u>
				<u>(gpm)</u>	<u>(lb/sec)</u>	
22	Nitrogen	0	Ambient	0	0	850 <sup>b</sup>
23	“	0	“	0	0	500
24	Recirc. coolant	-	243	0	0	-
25	“	12	243	5300	705	-
26	“	113	243	5300	705	-
27	“	-	243	5300	705	-
28	“	29	182	3614	481	-
29	“	56	182	0	0	-
30	“	60	182	1686	224	-
31	“	65	182	5300	705	-
35	Refueling water	-	100	0	0	-
36	“	-	100	0	0	-
37	“	-	100	0	0	-
38	“	-	100	0	0	-
39	“	-	100	0	0	-
40	“	-	100	0	0	-
41	“	-	100	0	0	-
42	“	-	100	0	0	-

NOTES TO FIGURE 6.3-2

(Sheet 11 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow#</u>		<u>Volume (gal)</u>
				<u>(gpm)</u>	<u>(lb/sec)</u>	
43	Recirc. coolant	Containment	243	-	-	350,000
44	“	”	243	5300	705	-
45	“	”	243	0	0	-
46	Refueling water	Low pressure	100	0	0	-
47	“	”	100	0	0	-
48	“	”	100	0	0	-
49	“	”	100	0	0	-
50	“	”	100	0	0	-
51	“	”	100	0	0	-
52	Recirc. coolant	-	182	0	0	-
53	“	-	182	0	0	-
54	“	-	182	0	0	-
55	“	1519	182	419	56	-
56	“	>30	182	838	111	-
57	“	30	182	419	45	-
58	“	30	182	419	56	-
59	“	1519	182	419	56	-
60	“	1516	182	124	16	-
61	“	0	182	124	16	-
62	“	1456	182	714	95	-

NOTES TO FIGURE 6.3-2

(Sheet 12 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow# (gpm)</u>	<u>(lb/sec)</u>	<u>Volume (gal)</u>
64	Recirc. coolant	1396	182	714	95	-
65	“	1008	182	178.5	24	-
66	“	388	182	178.5	24	-
73	Refueling water	-	100	0	0	-

NOTES TO FIGURE 6.3-2

(Sheet 13 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure</u>	<u>Temperature</u>	<u>Flow#</u>		<u>Volume</u>
		<u>(psig)***</u>	<u>(°F)</u>	<u>(gpm)</u>	<u>(lb/sec)</u>	<u>(gal)</u>
1	Refueling water	Atm tank	100	-	-	<5000
2	“	-	100	0	0	-
3	“	-	100	0	0	-
4	“	-	100	0	0	-
5	“	-	100	0	0	-
6	Recirc. coolant	-	182	0	0	-
7	Refueling water	-	100	0	0	-
8	“	-	100	0	0	-
9	Recirc. coolant	25	182	650	86	-
10	“	25	182	650	86	-
11	“	715	182	650	86	-
12	Refueling water	-	100	0	0	-
13	Recirc. coolant	25	182	650	86	-
14	“	715	182	650	86	-
15	Refueling water	-	100	0	0	-
16	“	-	100	0	0	-
17	Recirc. coolant	0	182	0	0	-
18	“	-	182	0	0	-
19	“	-	182	0	0	-
20	“	-	182	0	0	-
21	Nitrogen	-	Ambient	0	0	-

NOTES TO FIGURE 6.3-2

(Sheet 14 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure</u> <u>(psig)***</u>	<u>Temperature</u> <u>(°F)</u>	<u>Flow#</u>		<u>Volume</u> <u>(gal)</u>
				<u>(gpm)</u>	<u>(lb/sec)</u>	
22	Nitrogen	0	Ambient	0	0	850 <sup>b</sup>
23	“	0	Ambient	0	0	500
24	Recirc. coolant	-	243	0	0	-
25	“	-	<212	0	0	-
26	“	-	<212	0	0	-
27	“	-	<212	0	0	-
28	“	-	<182	0	0	-
29	“	-	<182	0	0	-
30	“	-	<182	0	0	-
31	“	-	<182	0	0	-
35	“	12	243	5300	705	-
36	“	113	243	5300	705	-
37	“	-	243	5300	705	-
38	“	-	<182	0	0	-
39	“	55	182	0	0	-
40	“	60	182	2138	284	-
41	“	65	182	5300	705	-
42	“	55	182	3162	421	-

NOTES TO FIGURE 6.3-2

(Sheet 15 of 16)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow# (gpm)</u>	<u>(lb/sec)</u>	<u>Volume (gal)</u>
43	Recirc. coolant	Containment pressure	243	-	-	-
44	“	”	243	0	0	-
45	“	”	243	5300	705	-
46	“	7	182	3162	421	-
47	“	5	182	1581	210	-
48	“	645	182	650	86	-
49	“	-	182	1906	253	-
50	“	645	182	650	86	-
51	“	-	182	325	43	-
52	“	-	182	0	0	-
53	“	-	182	0	0	-
54	“	-	182	2138	284	-
55	“	1519	182	419	56	-
56	“	<35	182	1300	173	-
57	“	35	182	419	56	-
58	“	35	182	419	56	-
59	“	1516	182	419	56	-
60	“	1516	182	124	16	-
61	“	0	182	124	16	-
62	“	1456	182	714	95	-

NOTES TO FIGURE 6.3-2

(Sheet 16 of 16)

MODE C - HOT LEG RECIRCULATION (PUMP NUMBER 1 OPERATING)

<u>Location</u>	<u>Fluid</u>	<u>Pressure (psig)***</u>	<u>Temperature (°F)</u>	<u>Flow#</u>		<u>Volume (gal)</u>
				<u>(gpm)</u>	<u>(lb/sec)</u>	
64	Recirc. coolant	1396	182	714	95	-
65	“	1008	182	178.5	24	-
66	“	388	182	178.5	24	-
73	Refueling water	-	100	0	0	-

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Footnotes

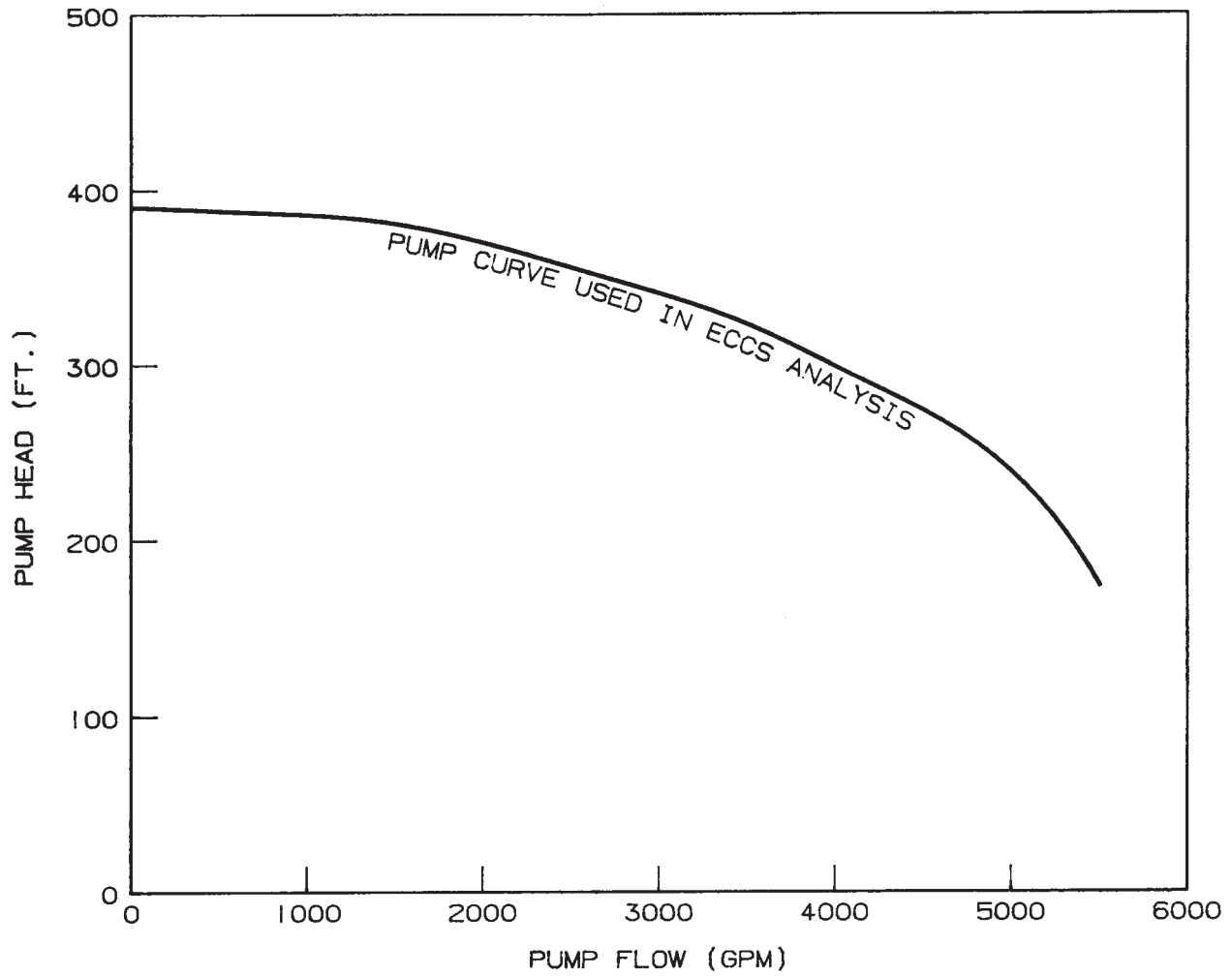
\*\* At reference conditions, 100° F and 0 psig.

\*\*\* Listed pressure provides adequate NPSH to the charging and safety injection pumps at the corresponding flow conditions. Actual minimum available NPSH based on the actual layout and with conservative assumptions is provided in Table 6.3-1.

\*\*\*\* Minimum allowable volume at normal operating conditions.

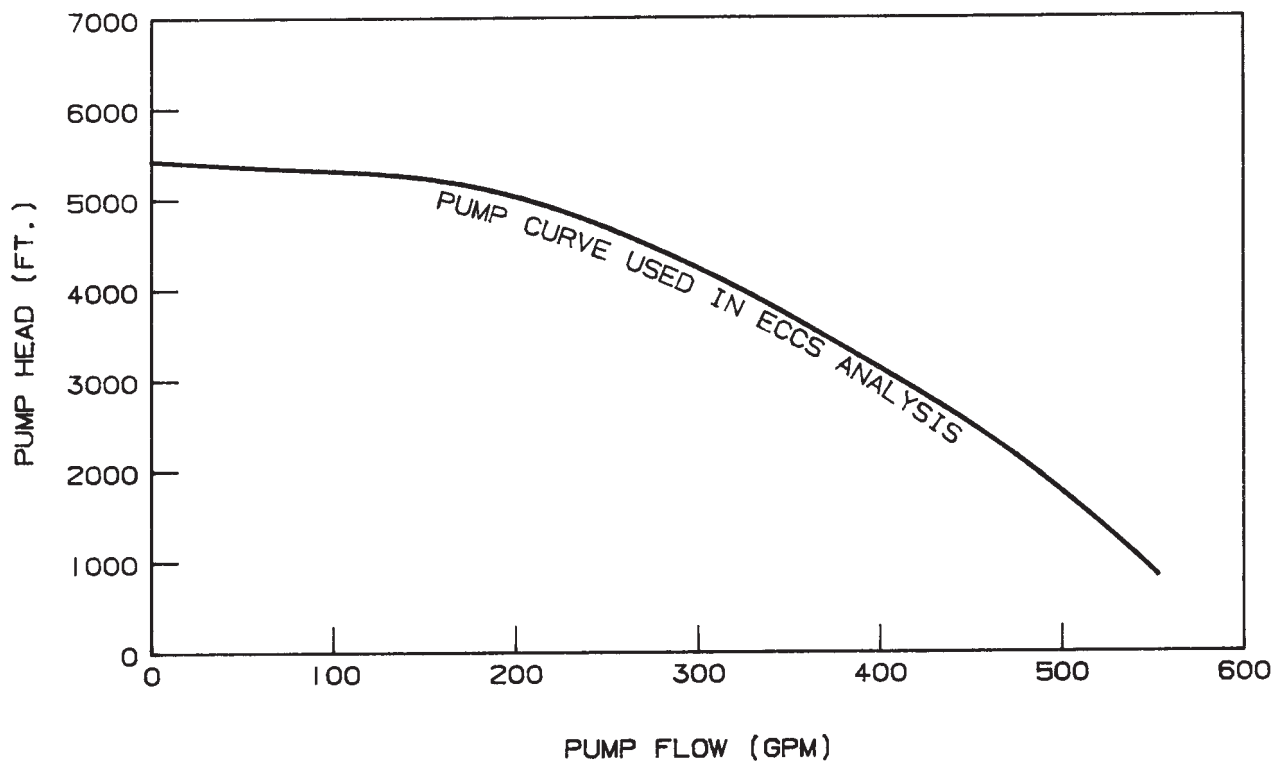
# At reference conditions, 212°F and 0 psig.





AMENDMENT 53  
NOVEMBER 5, 1984

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
Residual Heat Removal Pump Performance Curve
<b>FIGURE 6.3-3.</b>

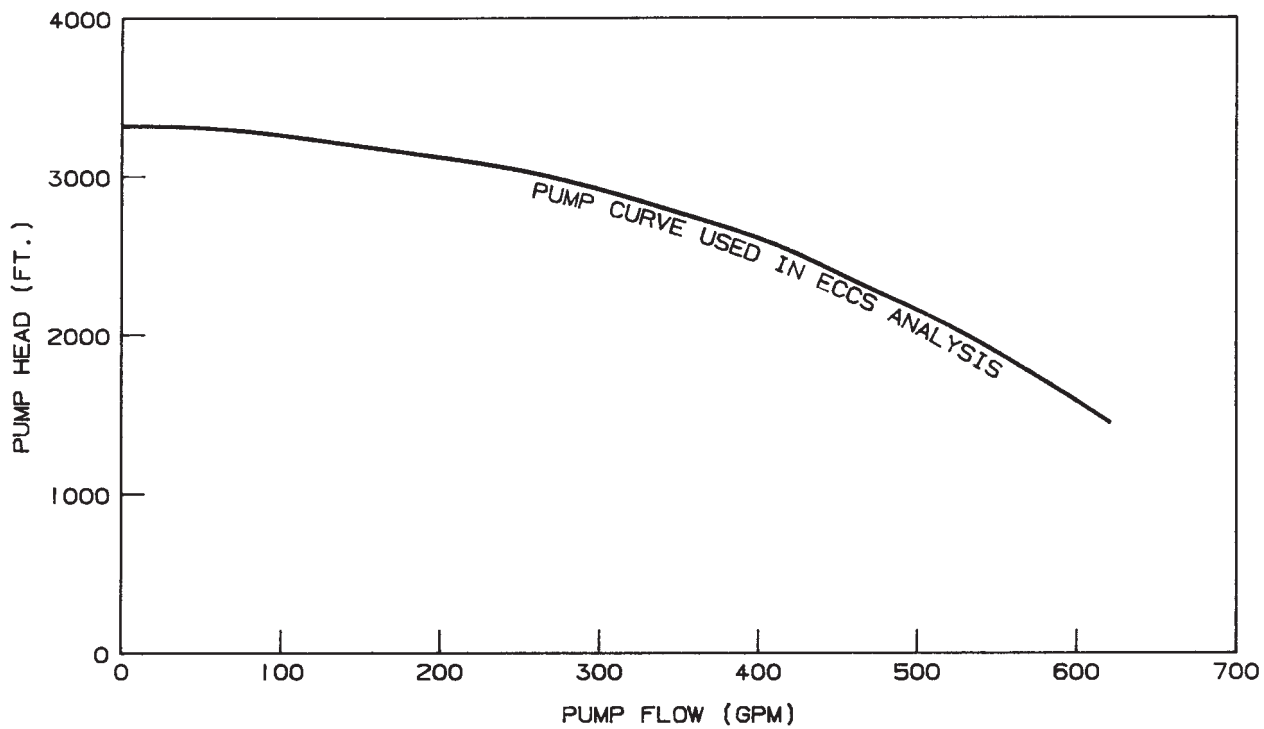


AMENDMENT 53  
NOVEMBER 5, 1984

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Centrifugal Charging Pump  
Performance Curve

FIGURE 6.3-4.



AMENDMENT 53  
NOVEMBER 5, 1984

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
Safety Injection Pump Performance Curve
FIGURE 6.3-5.

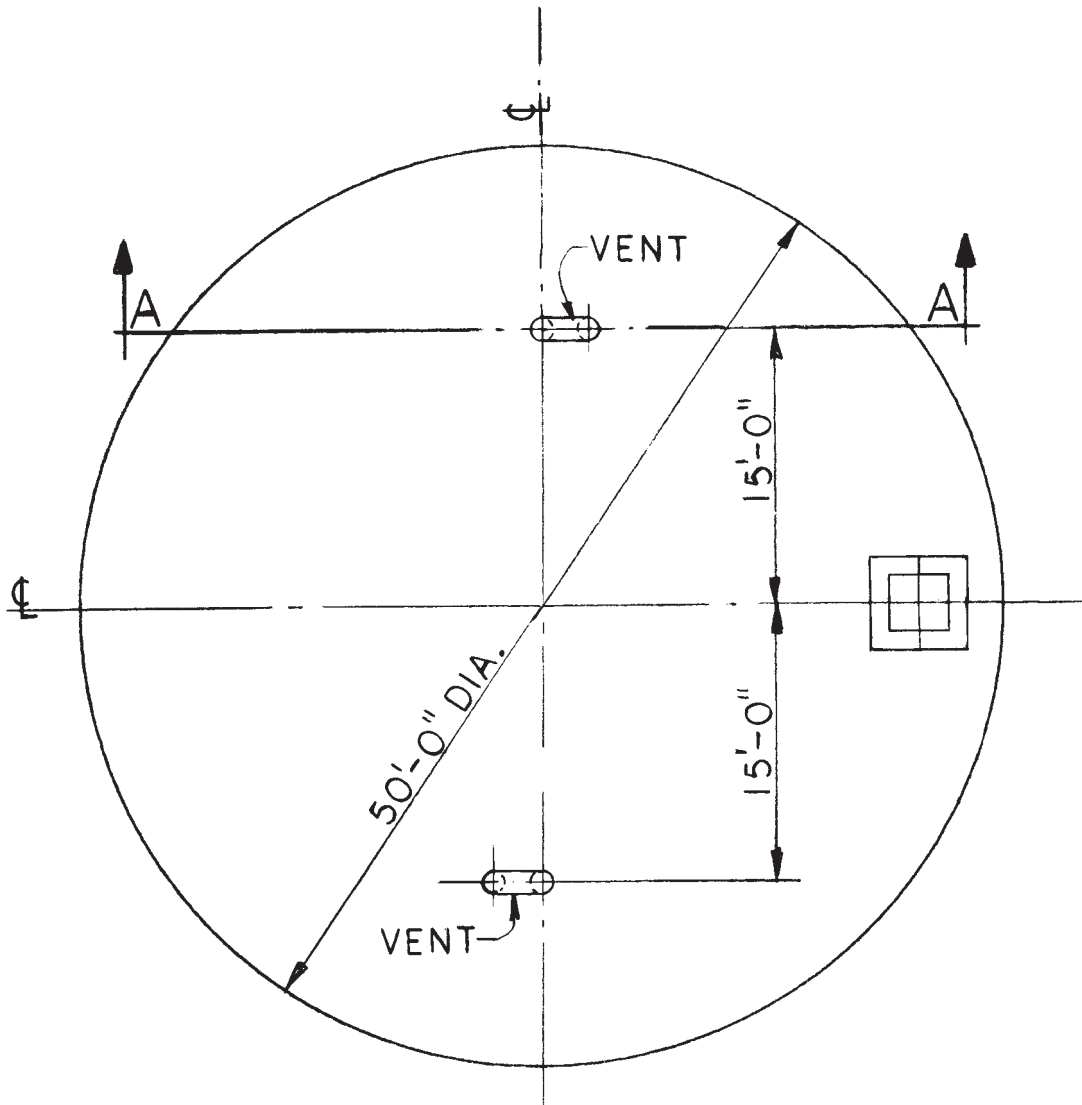
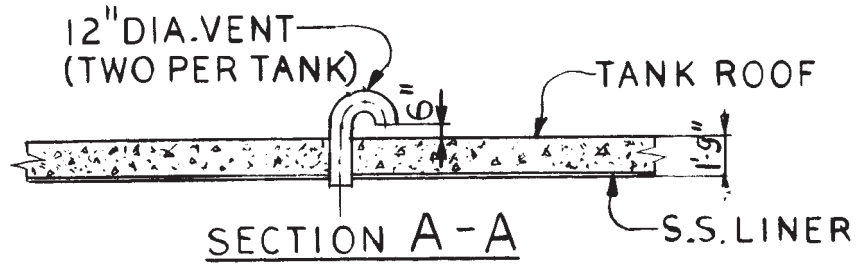
See Figure 6.2.2.-3

AMENDMENT 52  
AUGUST 27, 1984

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

SUCTION PIPING FOR RHR AND  
CONTAINMENT SPRAY SUMP LINES

FIGURE 6.3-6



AMENDMENT 6  
MAY 31, 1979

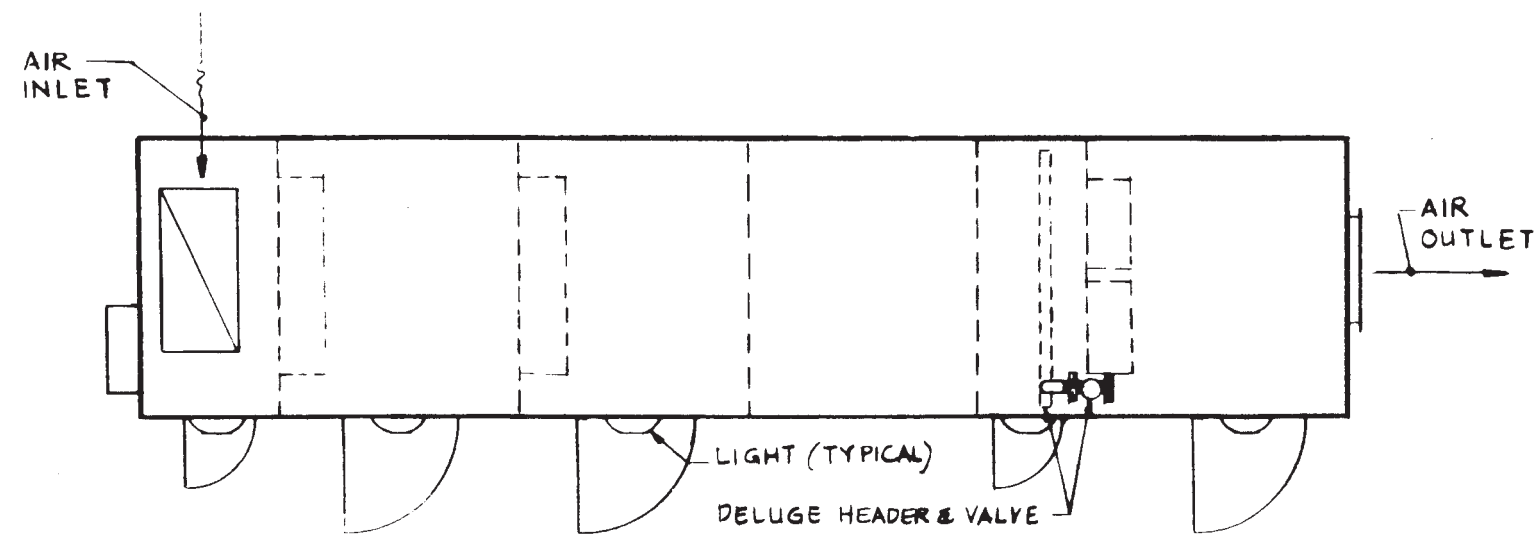
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

REFUELING WATER STORAGE  
TANK VENT

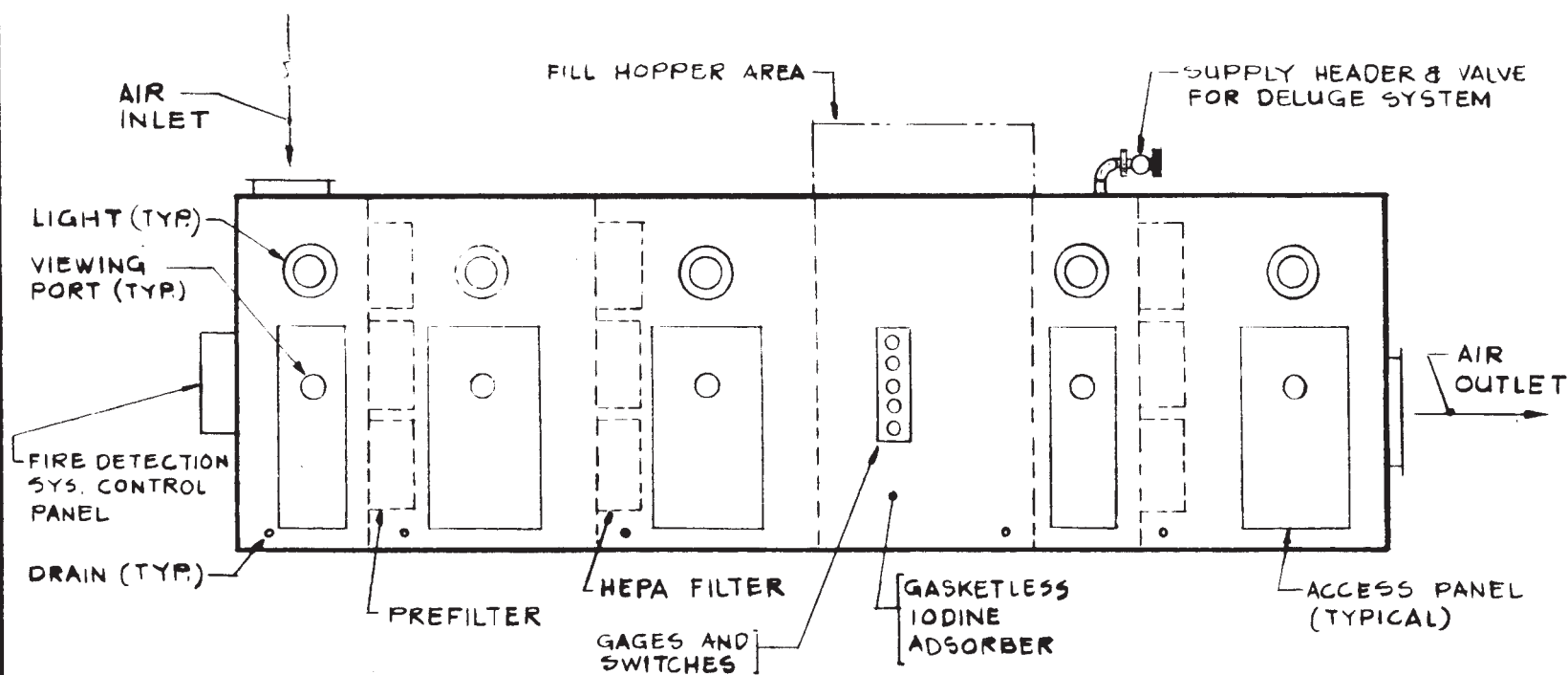
FIGURE 6.3-7

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PLAN



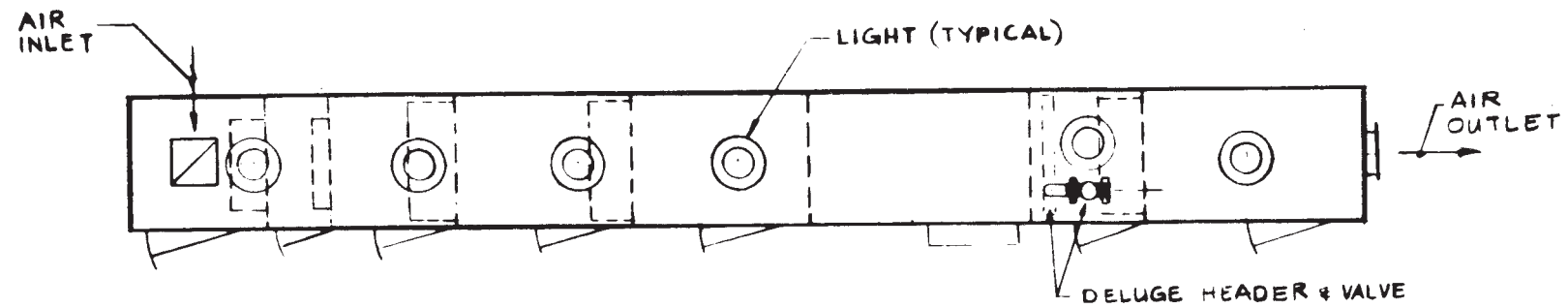
ELEVATION

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

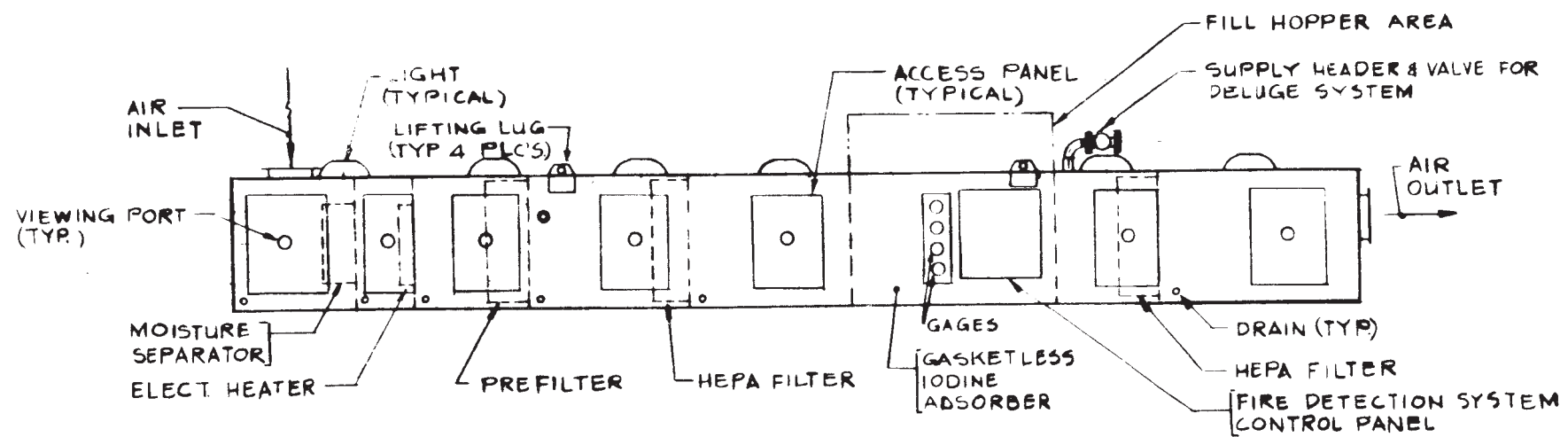
DETAIL OF FILTER TRAIN  
CONTROL ROOM EMERGENCY  
FILTRATION UNIT

FIGURE 6.4-1



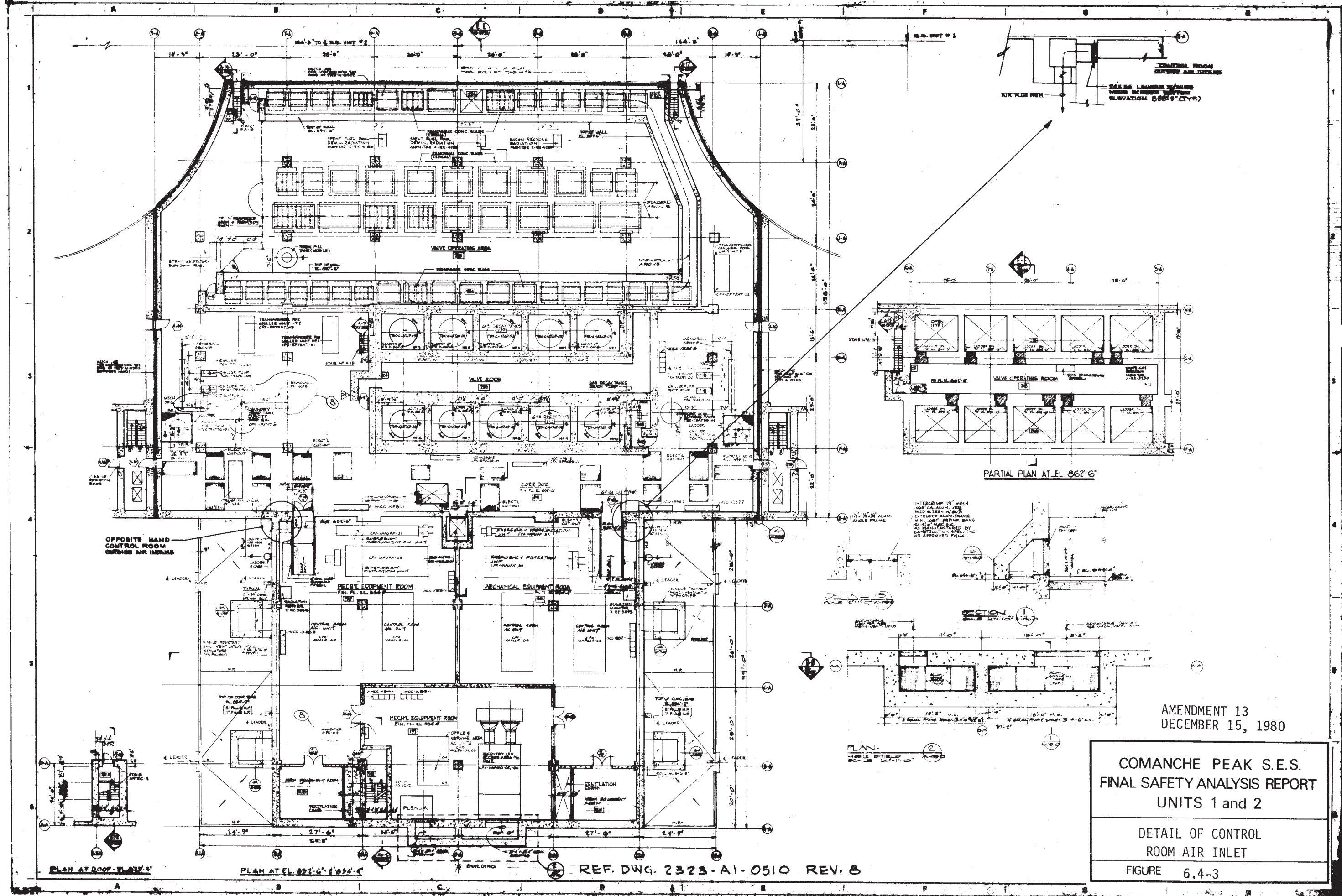


PLAN



ELEVATION

COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 -----  
 DETAIL OF FILTER TRAIN  
 CONTROL ROOM EMERGENCY  
 PRESSURIZATION UNIT  
 -----  
 FIGURE 6.4-2



AMENDMENT 13  
DECEMBER 15, 1980

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

---

DETAIL OF CONTROL  
ROOM AIR INLET

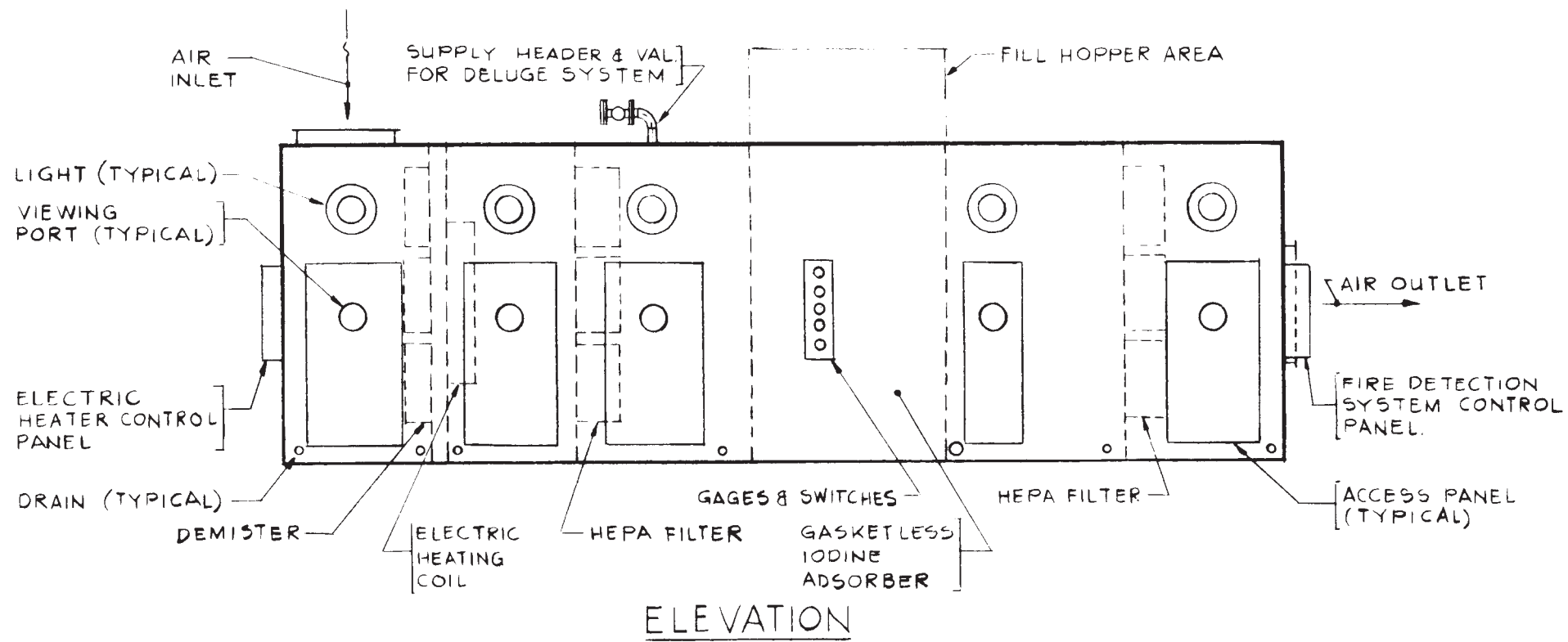
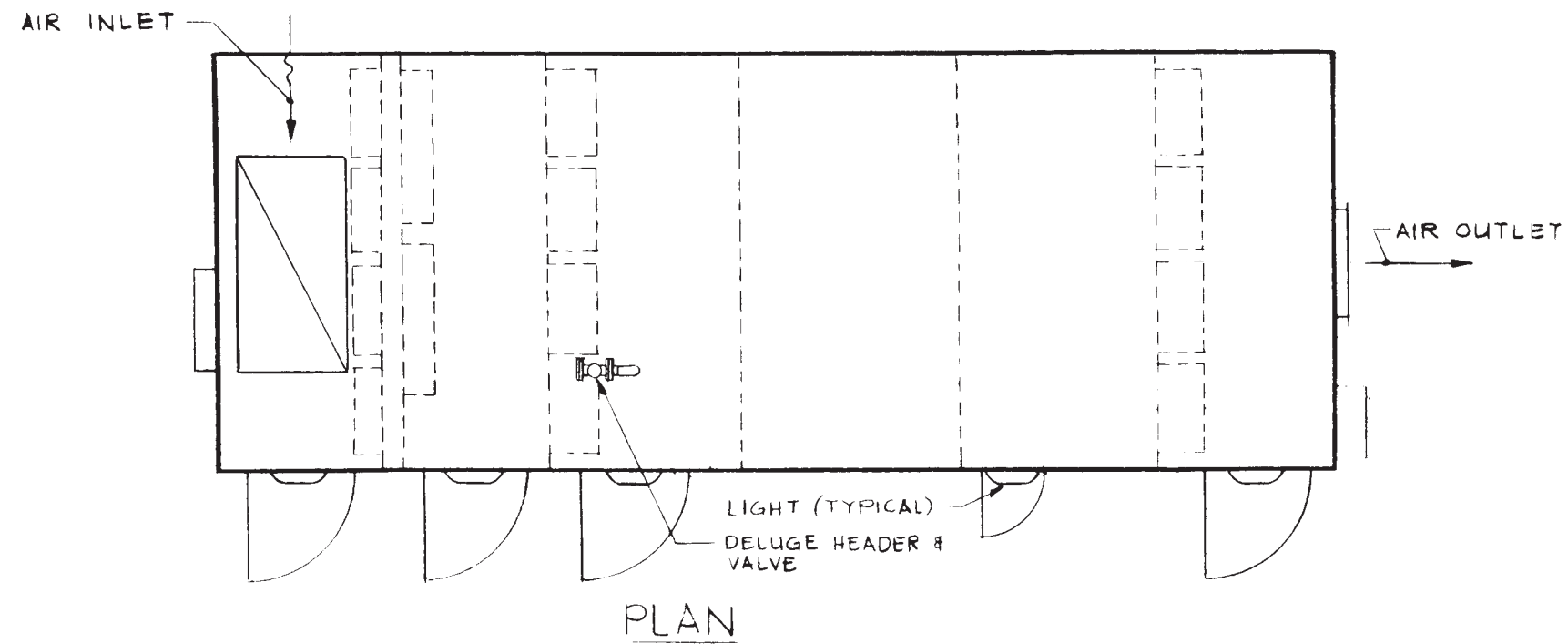
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FIGURE 6.4-3

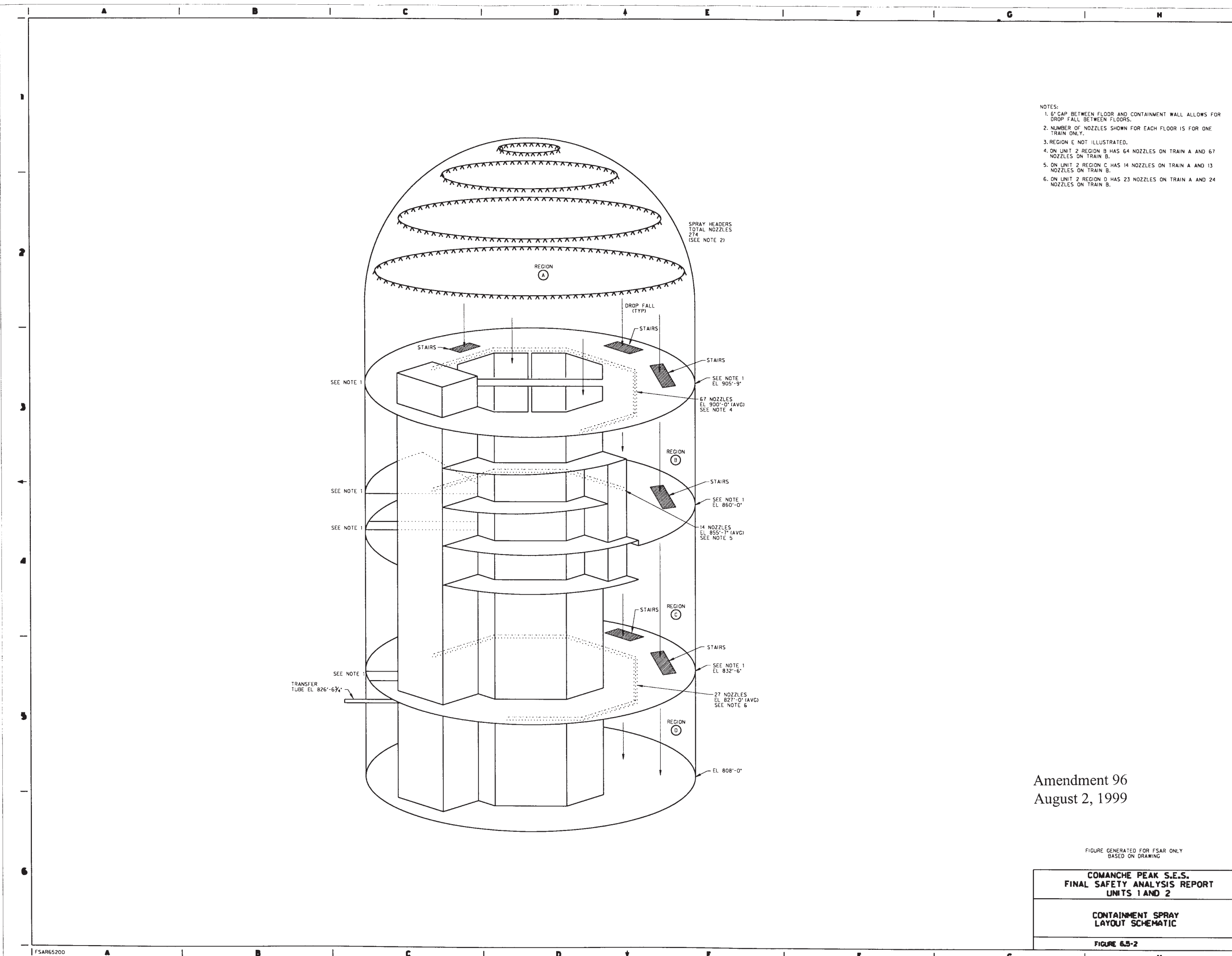
PLAN AT ROOF TYPICAL

PLAN AT EL. 867'-6" & 864'-4"

REF. DWG. 2325-A1-0510 REV. 8



COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 DETAIL OF FILTER TRAIN -  
 ESF  
 FIGURE 6.5-1



- NOTES:
1. 6" GAP BETWEEN FLOOR AND CONTAINMENT WALL ALLOWS FOR DROP FALL BETWEEN FLOORS.
  2. NUMBER OF NOZZLES SHOWN FOR EACH FLOOR IS FOR ONE TRAIN ONLY.
  3. REGION E NOT ILLUSTRATED.
  4. ON UNIT 2 REGION B HAS 64 NOZZLES ON TRAIN A AND 67 NOZZLES ON TRAIN B.
  5. ON UNIT 2 REGION C HAS 14 NOZZLES ON TRAIN A AND 13 NOZZLES ON TRAIN B.
  6. ON UNIT 2 REGION D HAS 23 NOZZLES ON TRAIN A AND 24 NOZZLES ON TRAIN B.

SPRAY HEADERS  
TOTAL NOZZLES  
274  
(SEE NOTE 2)

REGION  
A

DROP FALL  
(TYP)

STAIRS

STAIRS

STAIRS

SEE NOTE 1

SEE NOTE 1  
EL 905'-9"

67 NOZZLES  
EL 900'-0" (AVG)  
SEE NOTE 4

REGION  
B

STAIRS

SEE NOTE 1

SEE NOTE 1  
EL 860'-0"

14 NOZZLES  
EL 855'-7" (AVG)  
SEE NOTE 5

SEE NOTE 1

REGION  
C

STAIRS

STAIRS

SEE NOTE 1

SEE NOTE 1  
EL 832'-6"

27 NOZZLES  
EL 827'-0" (AVG)  
SEE NOTE 6

TRANSFER  
TUBE EL 826'-6 3/4"

REGION  
D

EL 808'-0"

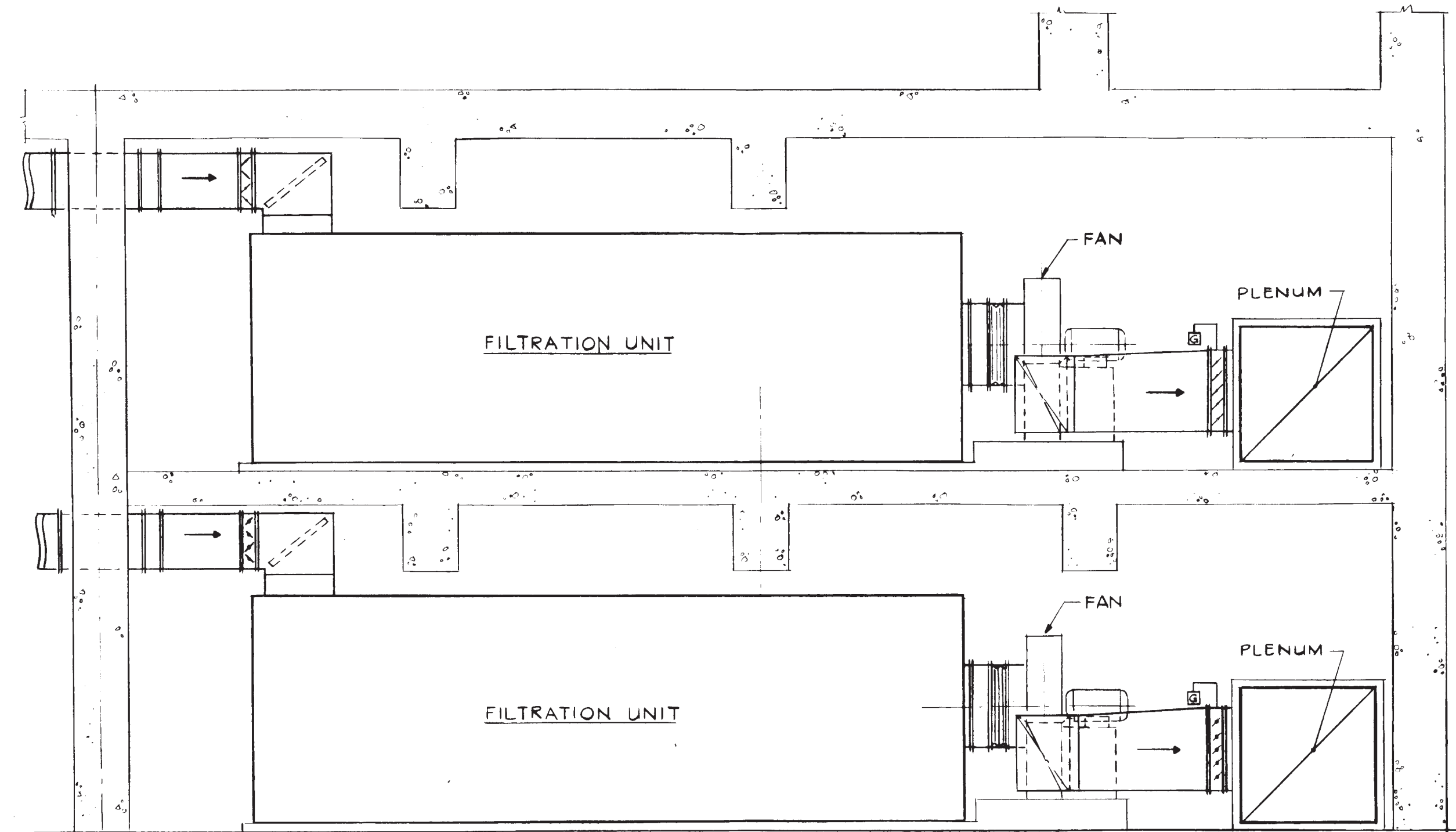
Amendment 96  
August 2, 1999

FIGURE GENERATED FOR FSAR ONLY  
BASED ON DRAWING

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

CONTAINMENT SPRAY  
LAYOUT SCHEMATIC

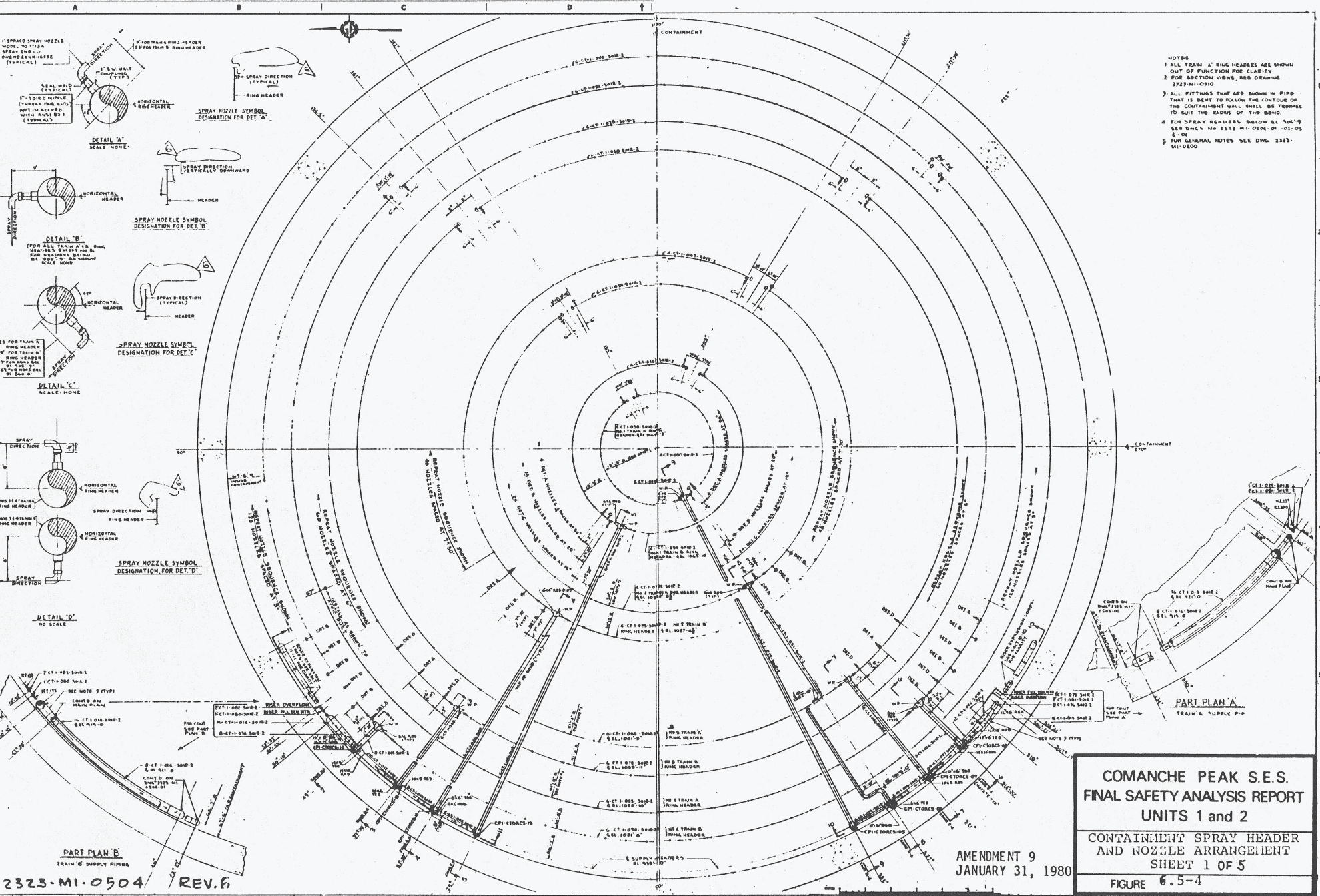
FIGURE 6.5-2



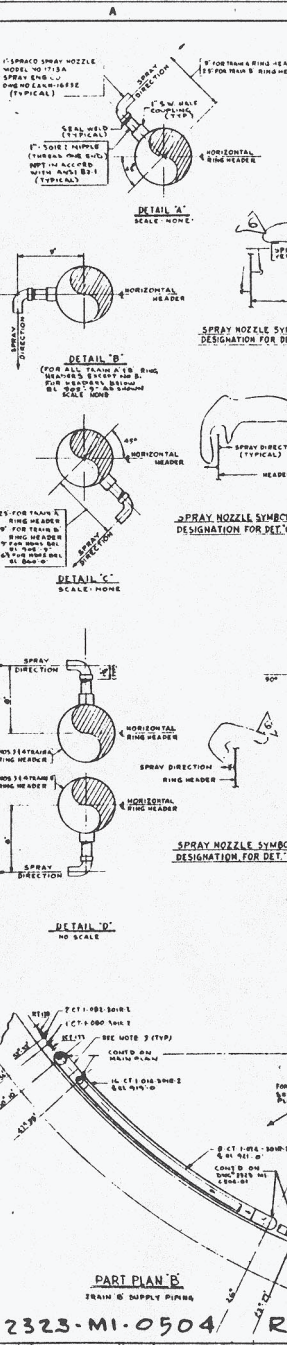
SECTION

COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 FILTER TRAIN SEPARATION  
 FIGURE 6.5-3





- NOTES
1. ALL TRAIN 'A' RING HEADERS ARE SHOWN OUT OF FUNCTION FOR CLARITY.
  2. FOR SECTION VIEWS, SEE DRAWING 2323-MI-0510
  3. ALL FITTINGS THAT ARE SHOWN IN PIPE THAT IS BENT TO FOLLOW THE CONTOUR OF THE CONTAINMENT WALL SHALL BE TURNED TO SUIT THE RADII OF THE BEND.
  4. FOR SPRAY HEADERS, BELOW ALL VMS, SEE DWG. NO. 2323-MI-0506-01, 02, 03 & 04.
  5. FOR GENERAL NOTES SEE DWG. 2323-MI-0500



**COMANCHE PEAK S.E.S.**  
**FINAL SAFETY ANALYSIS REPORT**  
**UNITS 1 and 2**

CONTAINMENT SPRAY HEADER  
 AND NOZZLE ARRANGEMENT  
 SHEET 1 OF 5

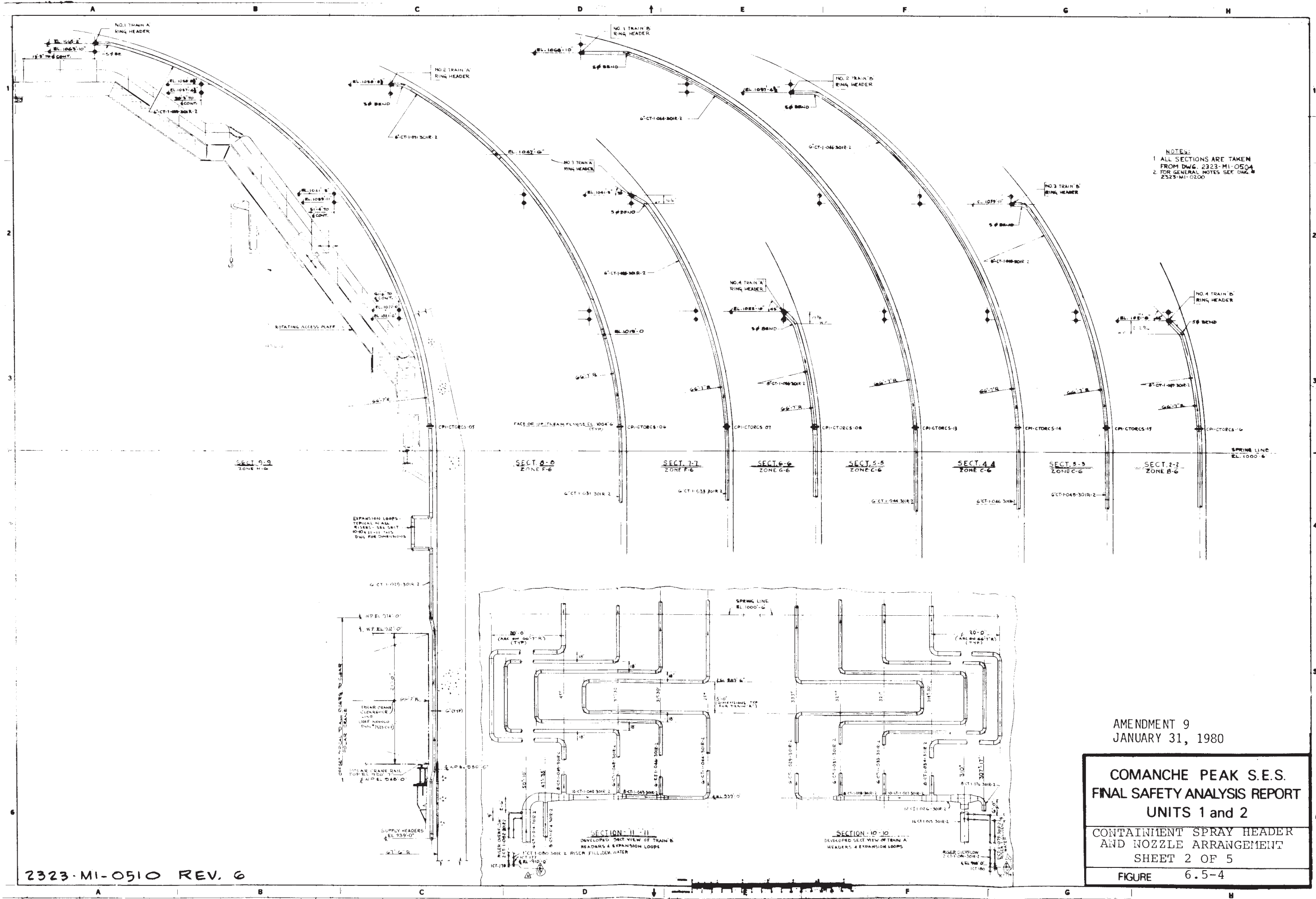
FIGURE 6.5-4

AMENDMENT 9  
 JANUARY 31, 1980

2323-MI-0504 REV.6

PART PLAN B  
 TRAIN B SUPPLY PIPING

PART PLAN A  
 TRAIN A SUPPLY PIP



NOTES:  
 1 ALL SECTIONS ARE TAKEN FROM DWG. 2323-MI-0504  
 2 FOR GENERAL NOTES SEE DWG. 2323-MI-0200

AMENDMENT 9  
 JANUARY 31, 1980

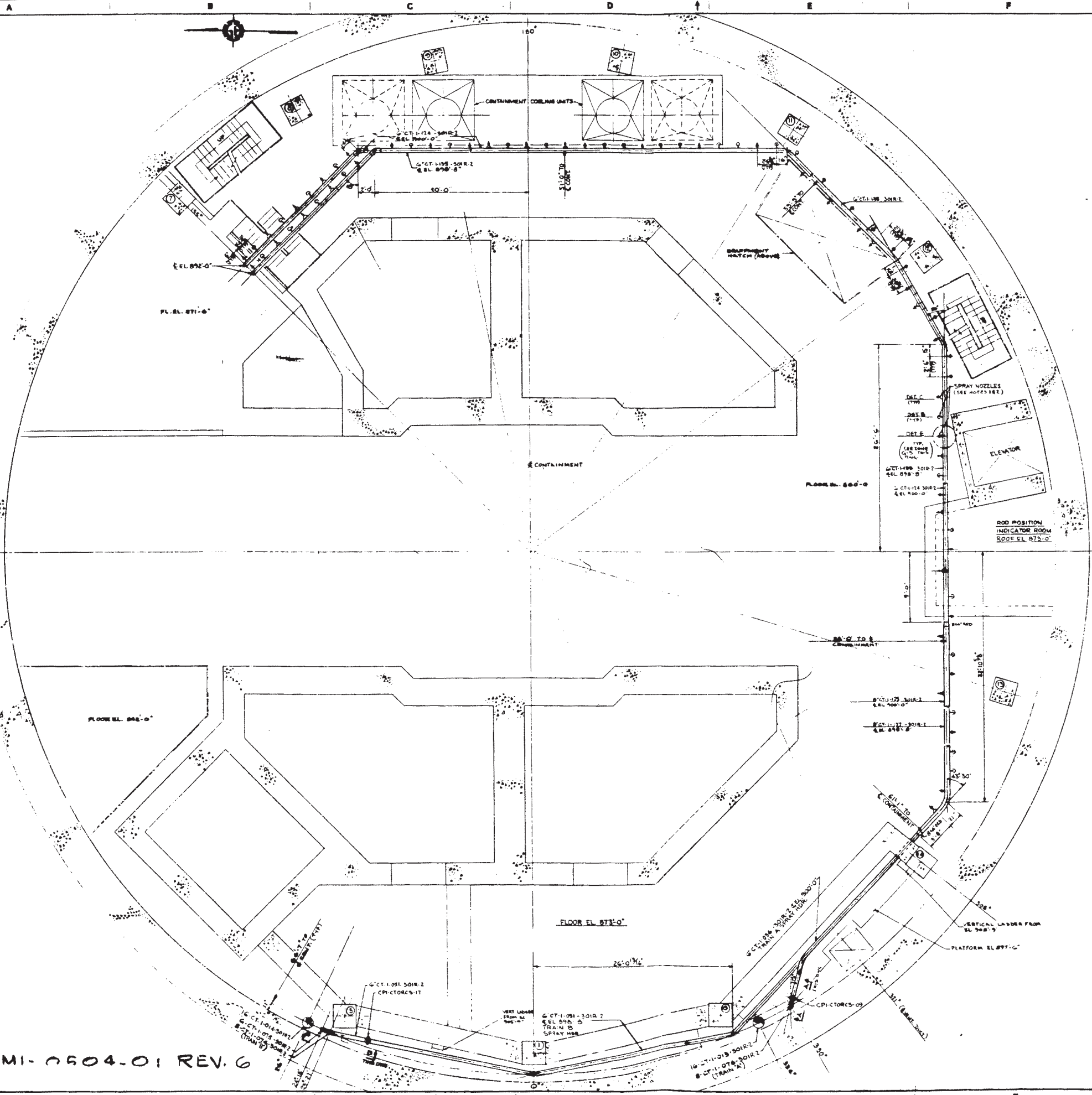
**COMANCHE PEAK S.E.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2**

CONTAINMENT SPRAY HEADER  
 AND NOZZLE ARRANGEMENT  
 SHEET 2 OF 5

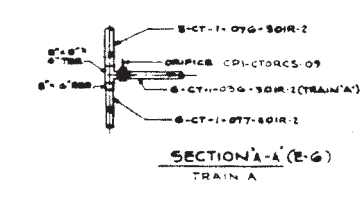
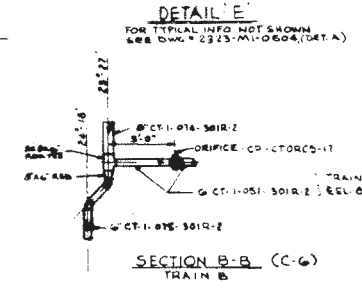
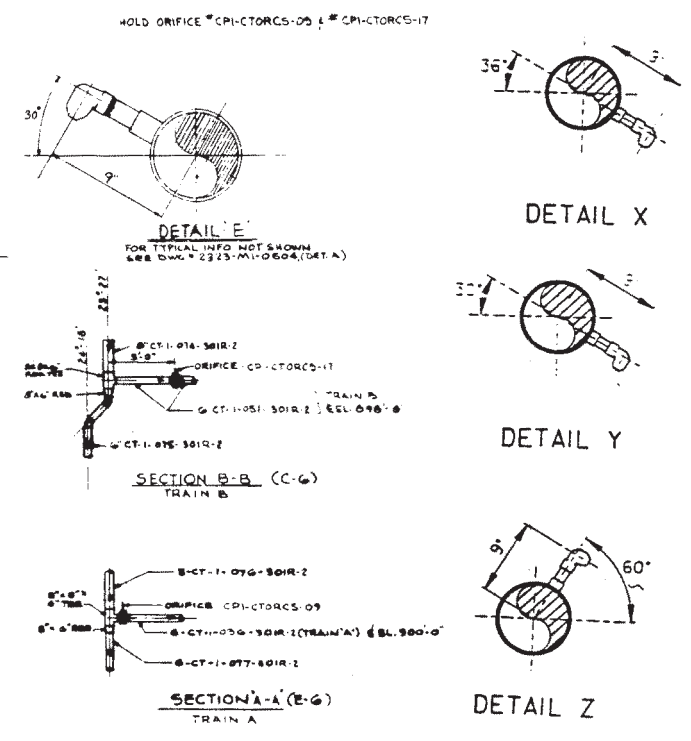
FIGURE 6.5-4

2323-MI-0510 REV. 6





- NOTES**
1. TRAIN A - 30 DETAIL B SPRAY NOZZLES, 15 DETAIL C SPRAY NOZZLES AND 19 DETAIL E SPRAY NOZZLES - TOTAL 64 NOZZLES  
 TRAIN B - 30 DETAIL B SPRAY NOZZLES, 1 SPECIAL SPRAY NOZZLE SPRAYING DIRECTION DOWN, 16 DETAIL C SPRAY NOZZLES, 17 DETAIL E SPRAY NOZZLES 1 EACH DETAIL X, Y AND Z SPRAY NOZZLES - TOTAL 67 NOZZLES.
  2. FOR NOZZLE DETAILS NOT SHOWN ON THIS DRAWING, SEE DWG 32323-M1-0504
  3. FOR CONT. SPRAY PIPING ABOVE, SEE DWG 32323-M1-0504
  4. FOR CONT. SPRAY PIPING BELOW, SEE DWG 32323-M1-0504-02
  5. FOR GENERAL NOTES, SEE DWG 32323-M1-0200
  6. ALL PIPING BENDS TO BE 6 DIA UNLESS OTHERWISE NOTED

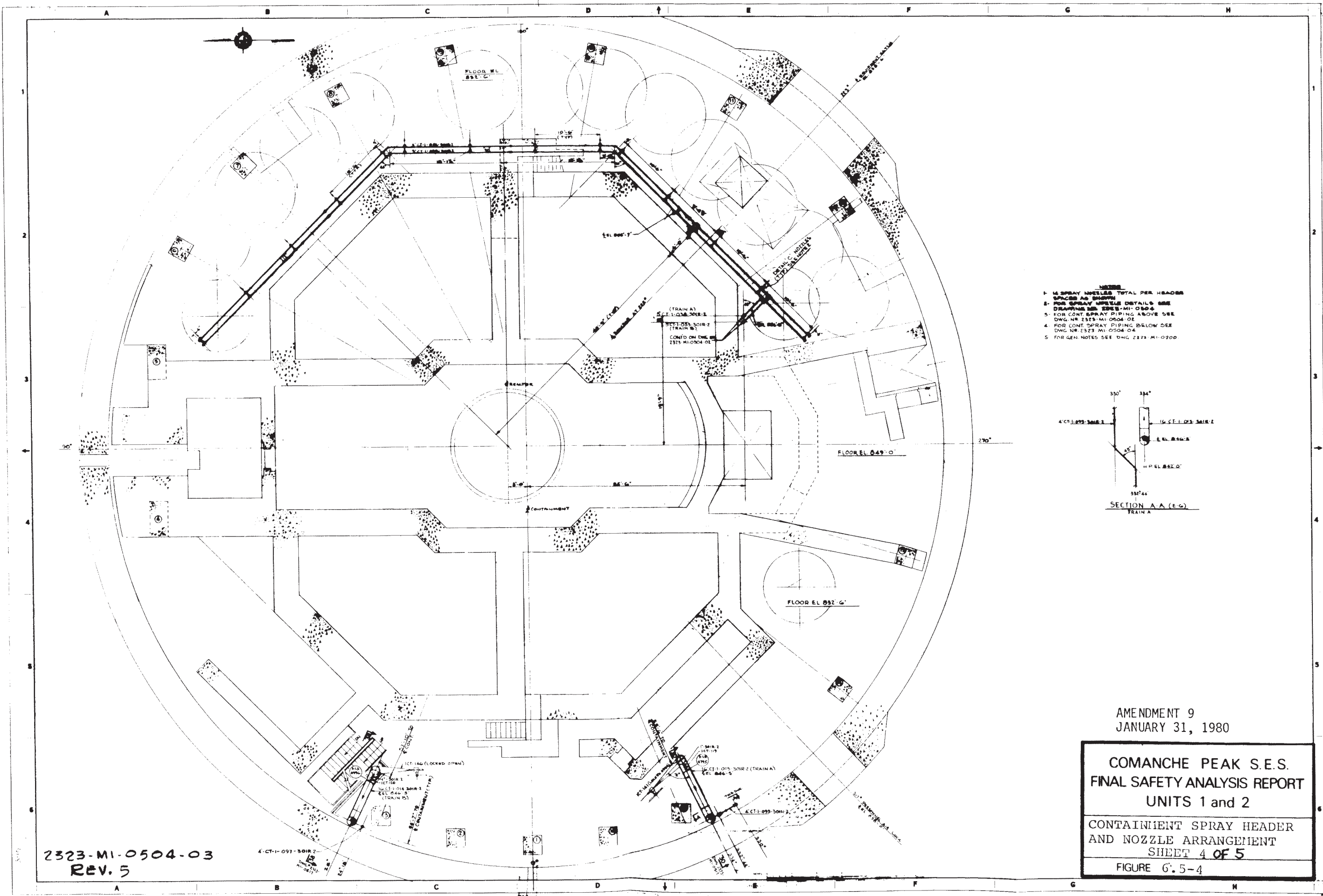


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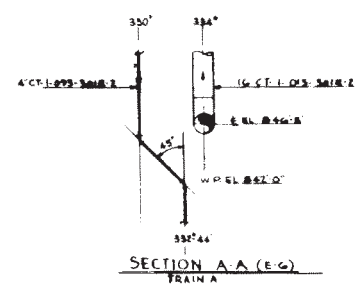
**COMANCHE PEAK S.E.S.**  
**FINAL SAFETY ANALYSIS REPORT**  
**UNITS 1 and 2**  
 CONTAINMENT SPRAY HEADER  
 AND NOZZLE ARRANGEMENT  
 SHEET 3 OF 5  
 FIGURE 6.5-4

2323-M1-0504-01 REV. 6





- NOTES**
1. 1/4" SPRAY NOZZLES TOTAL PER HEADER SPACES AS SHOWN
  2. FOR SPRAY NOZZLE DETAILS SEE DRAWING NO. 2323-MI-0504-04
  3. FOR CONT. SPRAY PIPING ABOVE SEE DWG. NO. 2323-MI-0504-02
  4. FOR CONT. SPRAY PIPING BELOW SEE DWG. NO. 2323-MI-0504-04
  5. FOR GEN. NOTES SEE DWG. 2323-MI-0700



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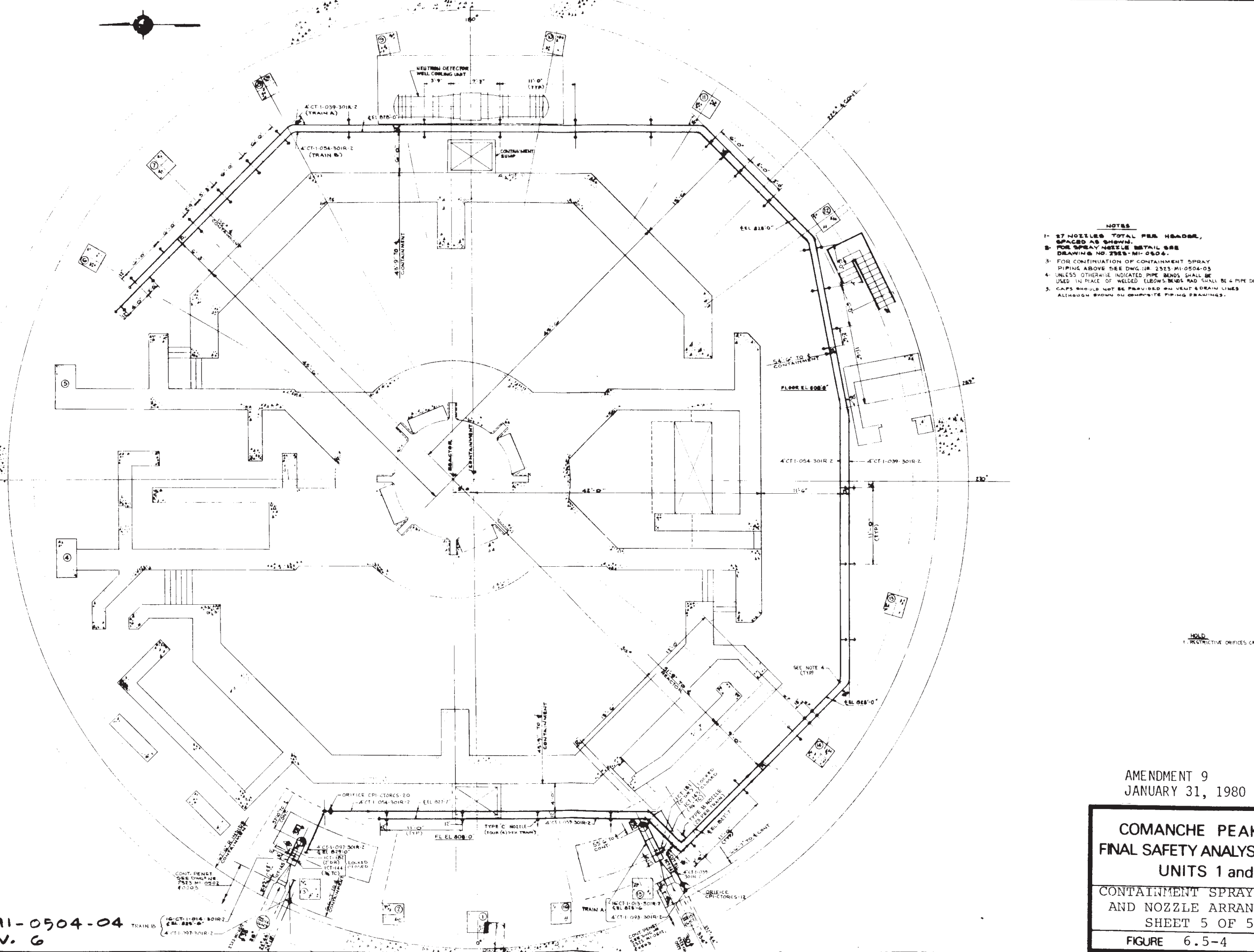
**COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2**

CONTAINMENT SPRAY HEADER  
AND NOZZLE ARRANGEMENT  
SHEET 4 OF 5

FIGURE 6.5-4

2323-MI-0504-03  
REV. 5

A B C D E F G H



- NOTES**
- 1- 27 NOZZLES TOTAL PER HEADER, SPACED AS SHOWN.
  - 2- FOR SPRAY NOZZLE DETAIL SEE DRAWING NO. 2323-MI-0504.
  - 3- FOR CONTINUATION OF CONTAINMENT SPRAY PIPING ABOVE SEE DWG. NO. 2323-MI-0504-03.
  - 4- UNLESS OTHERWISE INDICATED PIPE BENDS SHALL BE USED IN PLACE OF WELDED ELBOWS. BENDS RAD SHALL BE 4 PIPE DIA.
  - 5- CAPS SHOULD NOT BE PROVIDED ON VENT & DRAIN LINES ALTHOUGH SHOWN ON PREVIOUS PIPING DRAWINGS.

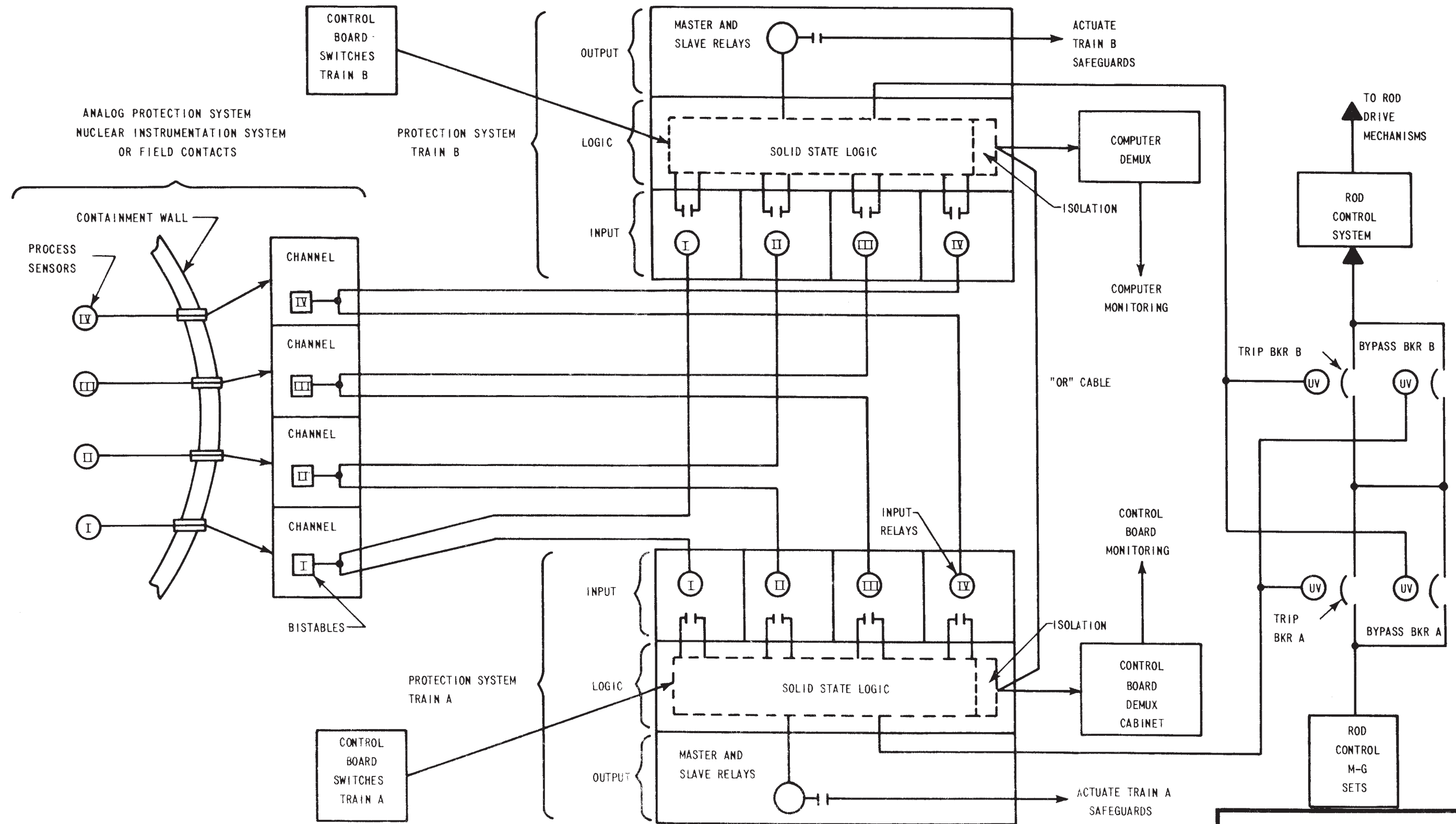
**HOLD**  
 1. RESTRICTIVE ORIFICES ON CHOCORES-12 & CHOCORES-20

AMENDMENT 9  
 JANUARY 31, 1980

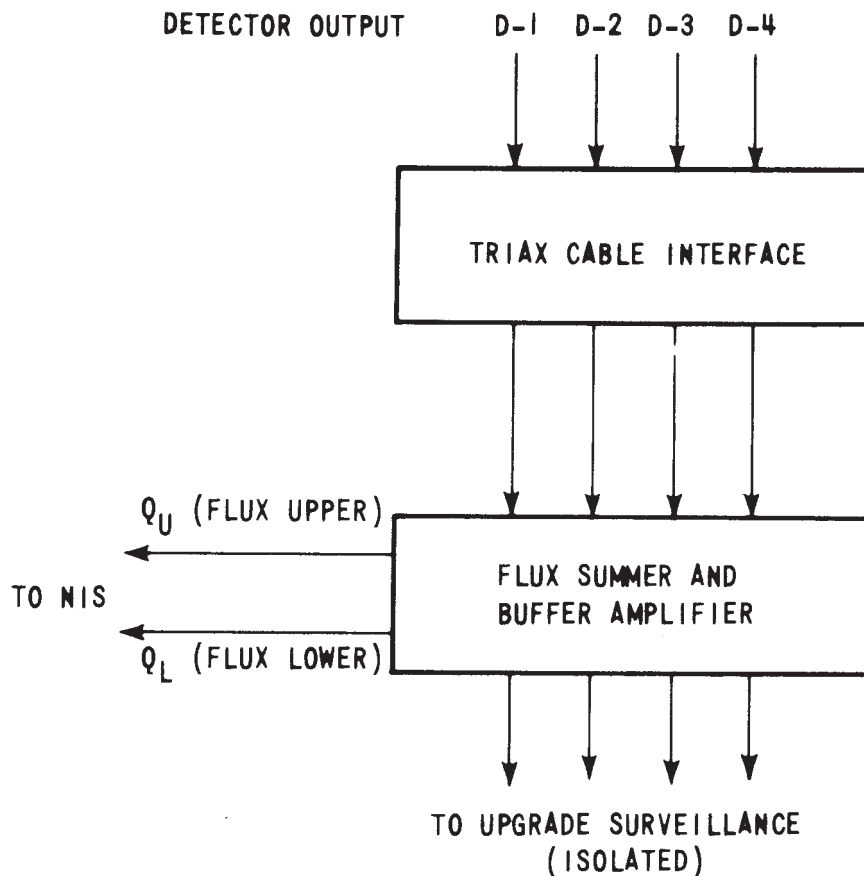
**COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 CONTAINMENT SPRAY HEADER  
 AND NOZZLE ARRANGEMENT  
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 FIGURE 6.5-4**

2323-MI-0504-04  
 REV. 6

A B C D E F G H



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UNITS 1 and 2  
Protection System Block Diagram  
FIGURE 7.1-1



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UNITS 1 and 2

Excore Instrumentation  
Interface (Typical of 4)

FIGURE 7.1-2

Explanatory Notes for Figure 7.1-3

These figures show relative locations of Class 1E and Accident Monitoring Instrumentation as required by FSAR Standard Format and address the requirement for "Location Layout Drawings" in FSAR Section 7.2, 7.3 and 7.5. All locations are approximate.

The following notes apply to these figures:

1. Reactor Trip System (RTS) and Engineered Safety Features Actuation (ESFAS) Instrumentation can be identified by the Protection group to which they are assigned. The symbol "PROT II" on the drawings means that the instrument is assigned to Protection Channel II; likewise for Channels I, III and IV.
2. An asterisk (\*) associated with a sensor or transmitter indicates an accident-monitoring device. Refer to table 7.5-7 for indication of the accident monitoring type and category.
3. The symbol "LI" refers to the identification of the local instrument rack on which the device is mounted.
4. These figures do not include valve, pump, fan, or damper status indication and do not include Post Accident Sampling System or Meteorological System indication for accident monitoring purposes.
5. These figures do not include Class 1E electrical equipment, such as metering equipment, relays and similar electrical hardware.
6. These figures do not include Reactor Coolant Pump Undervoltage/ Underfrequency sensors. Refer to Figure 8.3-5.
7. Location of sensors and transmitters shown is subject to minor relocation in accordance with established field relocation criteria.
8. Those instruments which are not identified as PROT I, II, III, IV, Train A or B are non-1E instruments.

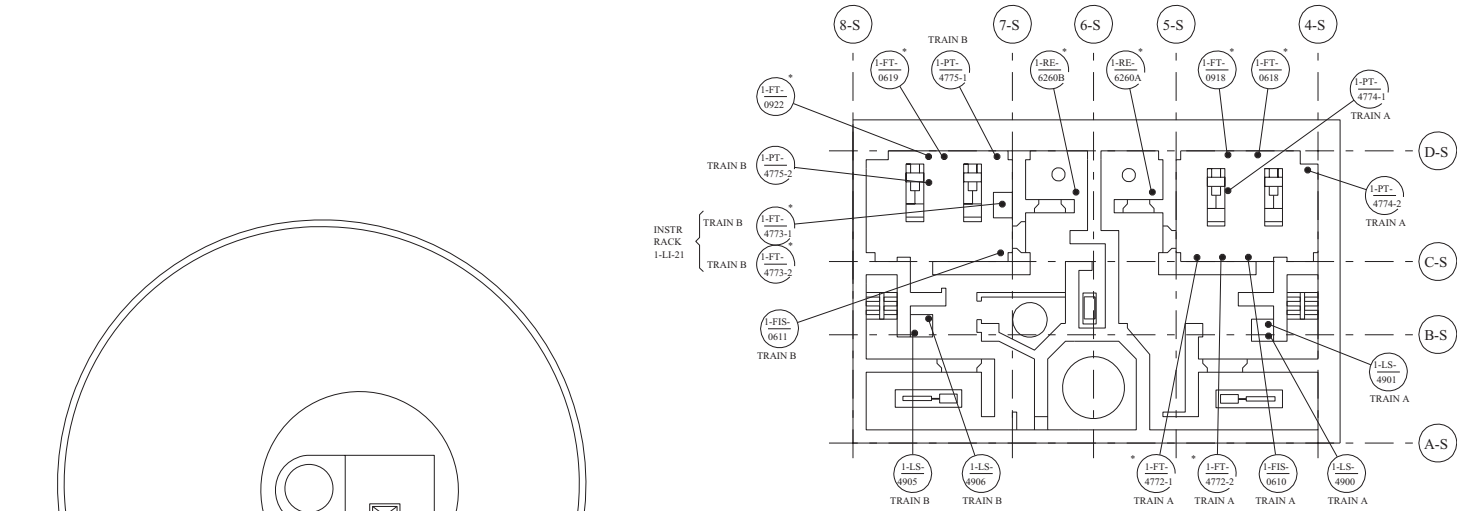
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UNITS 1 and 2

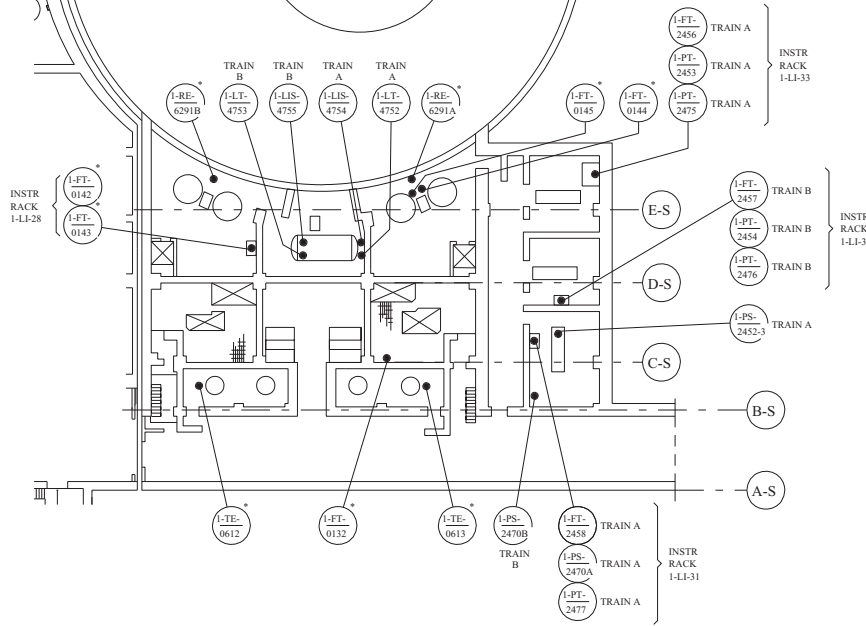
Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Explanatory Notes

Figure No. 7.1-3 (Sh. 1 of 36)



PLAN AT EL 773'-0"



PLAN AT EL 790'-6"

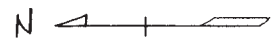
- PRIMARY PLANT - UNIT 1 CONTAINMENT AND SAFEGUARD BUILDINGS PLAN AT ELEVATION 790'-6"
- 1-FT-0132 RCS HI PRESS LETDOWN FLOW
  - 1-FT-0142 RCP 4 SEAL WATER INJ FLOW
  - 1-FT-0143 RCP 3 SEAL WATER INJ FLOW
  - 1-FT-0144 RCP 2 SEAL WATER INJ FLOW
  - 1-FT-0145 RCP 1 SEAL WATER INJ FLOW
  - 1-TE-0612 RHR DISCH TEMP (PUMP 1)
  - 1-TE-0613 RHR DISCH TEMP (PUMP 2)
  - 1-PS-2452-3 AFW PMP TURB LUB OIL PRESS
  - 1-PT-2453 MTR DRIVEN AFW PMP 01 DISCH
  - 1-PT-2454 MTR DRIVEN AFW PMP 01 DISCH
  - 1-PT-2456 MTR DRIVEN AFW PMP 01 DISCH
  - 1-FT-2457B MTR DRIVEN AFW PMP 02 DISCH
  - 1-FT-2458 TURB DRIVEN AFW PMP DISCH
  - 1-PS-2470A TURB DRIVEN AFW PMP SCT HDR PRESS LO
  - 1-PS-2470B TURB DRIVEN AFW PMP SCT HDR PRESS LO
  - 1-PT-2475 MTR DRIVEN AFW PMP 02 SUCT HDR
  - 1-PT-2477 TURB DRIVEN AFW PMP SUCT HDR
  - 1-LT-4752 CHEM ADD TANK
  - 1-LT-4753 CHEM ADD TANK
  - 1-LIS-4754 CHEM ADD TANK LEVEL LO
  - 1-LIS-4755 CHEM ADD TANK LEVEL LO
  - 1-RE-6291A HIGH RANGE AREA MONITOR ISOL VLV TANK TRN A
  - 1-RE-6291B HIGH RANGE AREA MONITOR ISOL VLV TANK TRN B

- PRIMARY PLANT - UNIT 1 CONTAINMENT AND SAFEGUARD BUILDINGS PLAN AT ELEVATION 773'-0"
- 1-FIS-0610 RHR PMP 1 MIN FLOW
  - 1-FIS-0611 RHR PMP 2 MIN FLOW
  - 1-FT-0618 RHR HX 1 BYP CONT
  - 1-FT-0619 RHR HX 2 BYP CONT
  - 1-FT-0918 SI PMP 1 DISCH
  - 1-FT-0922 SI PMP 2 DISCH
  - 1-FT-0988 RHR PMP DISCH
  - 1-FT-4772-1 CONTMT SPRAY PMP 1 DISCH
  - 1-FT-4772-2 CONTMT SPRAY PMP 3 DISCH
  - 1-FT-4773-1 CONTMT SPRAY PMP 2 DISCH
  - 1-FT-4773-2 CONTMT SPRAY PMP 4 DISCH
  - 1-PT-4774-1 CONTMT SPRAY PMP 1 DISCH
  - 1-PT-4774-2 CONTMT SPRAY PMP 3 DISCH
  - 1-PT-4775-1 CONTMT SPRAY PMP 2 DISCH
  - 1-PT-4775-2 CONTMT SPRAY PMP 4 DISCH
  - 1-L-S-4900 SB FLR DR SUMP 2 LVL HI-LLO
  - 1-L-S-4901 SB FLR DR SUMP 2 LVL HI-2
  - 1-L-S-4905 SB FLR DR SUMP 1 LVL HI/LO
  - 1-L-S-4906 SB FLR DR SUMP 1 LVL HI-2
  - 1-RE-6260A HIGH RANGE AREA MONITOR RHR PUMP RM TRN A
  - 1-RE-6260B HIGH RANGE AREA MONITOR RHR PUMP RM TRN B

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FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2  
LOCATION OF CLASS 1E INSTRUMENTS  
AND ACCIDENT MONITORING INSTRUMENTS  
UNIT 1 CONTAINMENT AND  
SAFEGUARD BUILDINGS  
FIGURE NO 7.1-3 (SH 02 OF 36)





PROT. I (I-FT 434)

PROT. III (I-FT 436)

PROT. II (I-FT 435)

PROT. III (I-FT 426)

PROT. I (I-FT 424)

(I-LT 470)\*

PROT. II (I-FT 445)

(I-PT 469)\*

(I-LT 1003)\*

PROT. I (I-FT 444)

(I-TE 468)\*

PROT. III (I-FT 446)

(I-TE 605)\*

(I-LT 4779)\* TRAIN A

(I-LT 4781)\* TRAIN B

(I-FT 425) PROT. II

(I-FT 415) PROT. II

(I-RE 6292)\*

(I-FT 416) PROT. III

(I-FT 414) PROT. I

(I-RE 6261)\*

(I-RE 6259 B)\*

(I-RE 4200)\*

(I-RE 6259 A)\*

(I-TE 604)\*

Plan at EL. 808'-0" and 810'-6"

Plan at Elevations 808'-0" & 810'-6"

- 1-FT-414 RC Flow Loop 1
- 1-FT-415 RC Flow Loop 1
- 1-FT-416 RC Flow Loop 1
- 1-FT-424 RC Flow Loop 2
- 1-FT-425 RC Flow Loop 2
- 1-FT-426 RC Flow Loop 2
- 1-FT-434 RC Flow Loop 3
- 1-FT-435 RC Flow Loop 3
- 1-FT-436 RC Flow Loop 3
- 1-FT-444 RC Flow Loop 4
- 1-FT-445 RC Flow Loop 4
- 1-FT-446 RC Flow Loop 4
- 1-TE-468 PRZR Relief Tank
- 1-PT-469 PRZR Relief Tank
- 1-LT-470 PRZR Relief Tank
- 1-TE-604 Residual HX 1 Return
- 1-TE-605 Residual HX 2 Return
- 1-LT-1003 RC Drain Tank
- 1-LT-4779 CNTMT Level Wide Range
- 1-LT-4781 CNTMT Level Wide Range
- 1-RE-4200 SG Blo Dwn Mon
- 1-RE-6259A High Range Area Monitor Pipe Penet. S.
- 1-RE-6259B High Range Area Monitor Pipe Penet. N.
- 1-RE-6261 Low Range Area Monitor SB Sampling RM
- 1-RE-6292 High Range Area Monitor SWGR RM TRN A

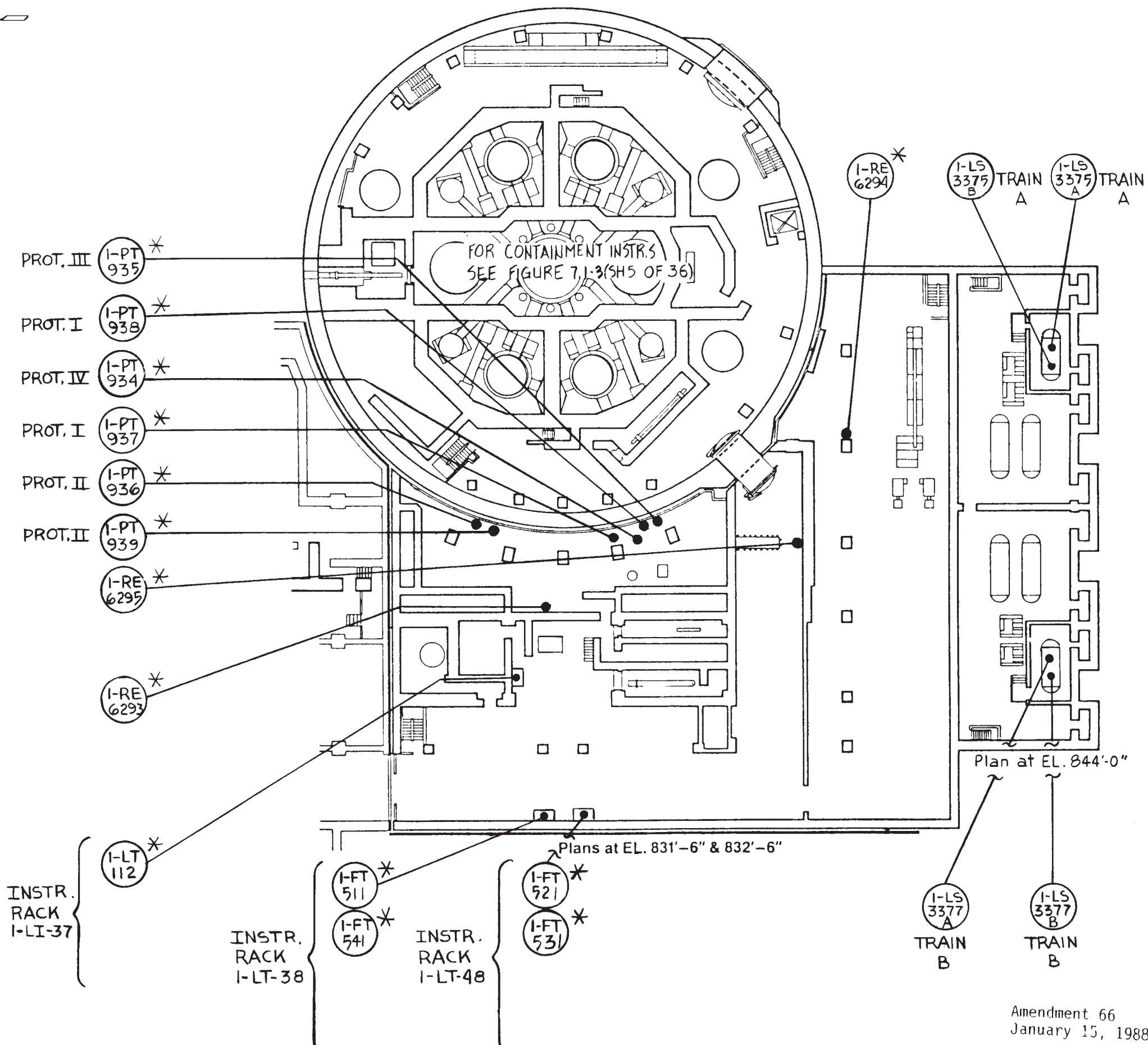
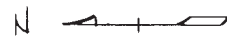
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Unit 1  
Containment & Safeguard Buildings  
Plans at EL. 808' 0" & 810' 6"

Figure No. 7.1-3 (Sh. 3 of 36)

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**Plan at Elevation 831'-6"**  
Safeguard Building

1-LT-112	Vol Control
1-PT-511	Stm Gen FW Flow Loop 1
1-PT-521	Stm Gen FW Flow Loop 2
1-PT-531	Stm Gen FW Flow Loop 3
1-PT-541	Stm Gen FW Flow Loop 4
1-PT-934	Containment Press
1-PT-935	Containment Press
1-PT-936	Containment Press
1-PT-937	Containment Press
1-PT-938	Containment Press
1-PT-939	Containment Press
1-RE-6293	High Range Area Monitor Pipe Penet.
1-RE-6294	High Range Area Monitor Elec. Equip.
1-RE-6295	High Range Area Monitor Containment Access Hall

**Plan at Elevation 844'-0"**  
Diesel Generator Building

1-LS-3375A	D.F.O. Day Tk 1 LVL Hi/Lo
1-LS-3375B	D.F.O. Day Tk 1 LVL Hi/Lo
1-LS-3377A	D.F.O. Day Tk 2 LVL Hi/Lo
1-LS-3377B	D.F.O. Day Tk 2 LVL Hi/Lo

**Plan at Elevations 832'-6" & 842'-6"**  
Containment Building

1-TE-001	Core Exit Temp
Thru 1-TE-050	
1-NE-31	Source Range I
1-NE-32	Source Range II
1-NE-35	Interm Range I
1-NE-36	Interm Range II
1-NE-41	Power Range I
1-NE-42	Power Range II
1-NE-43	Power Range III
1-NE-44	Power Range IV
1-NE-50A	Neutron Flux
1-NE-50B	Neutron Flux
1-PT-403	RC Loop 4 Wide Range
1-PT-405	RC Loop 1 Wide Range
1-JE-410	N-16 Detector Prot I
1-JE-420	N-16 Detector Prot II
1-JE-430	N-16 Detector Prot III
1-JE-440	N-16 Detector Prot IV

For Continuation of List  
See Figure No. 7.1-3 (sh. 5 of 36)

**COMANCHE PEAK S.E.S.**  
**FINAL SAFETY ANALYSIS REPORT**  
**UNITS 1 and 2**

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Unit 1  
Containment & Safeguard Buildings  
Plans at EL 831' 6" & 844' 0"

Figure No. 7.1-3 (Sh. 4 of 36)

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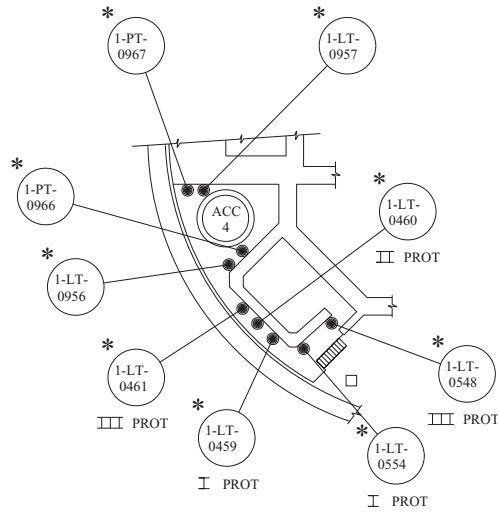






PLAN AT ELEVATION 842'-0"

1-LT-0459	PRZR LEVEL
1-LT-0460	PRZR LEVEL
1-LT-0461	PRZR LEVEL
1-LT-0548	ACCUM TANK 4
1-LT-0554	ACCUM TANK 4
1-LT-0956	ACCUM TANK 4
1-LT-0957	ACCUM TANK 4
1-PT-0966	ACCUM TANK 4
1-PT-0967	ACCUM TANK 4



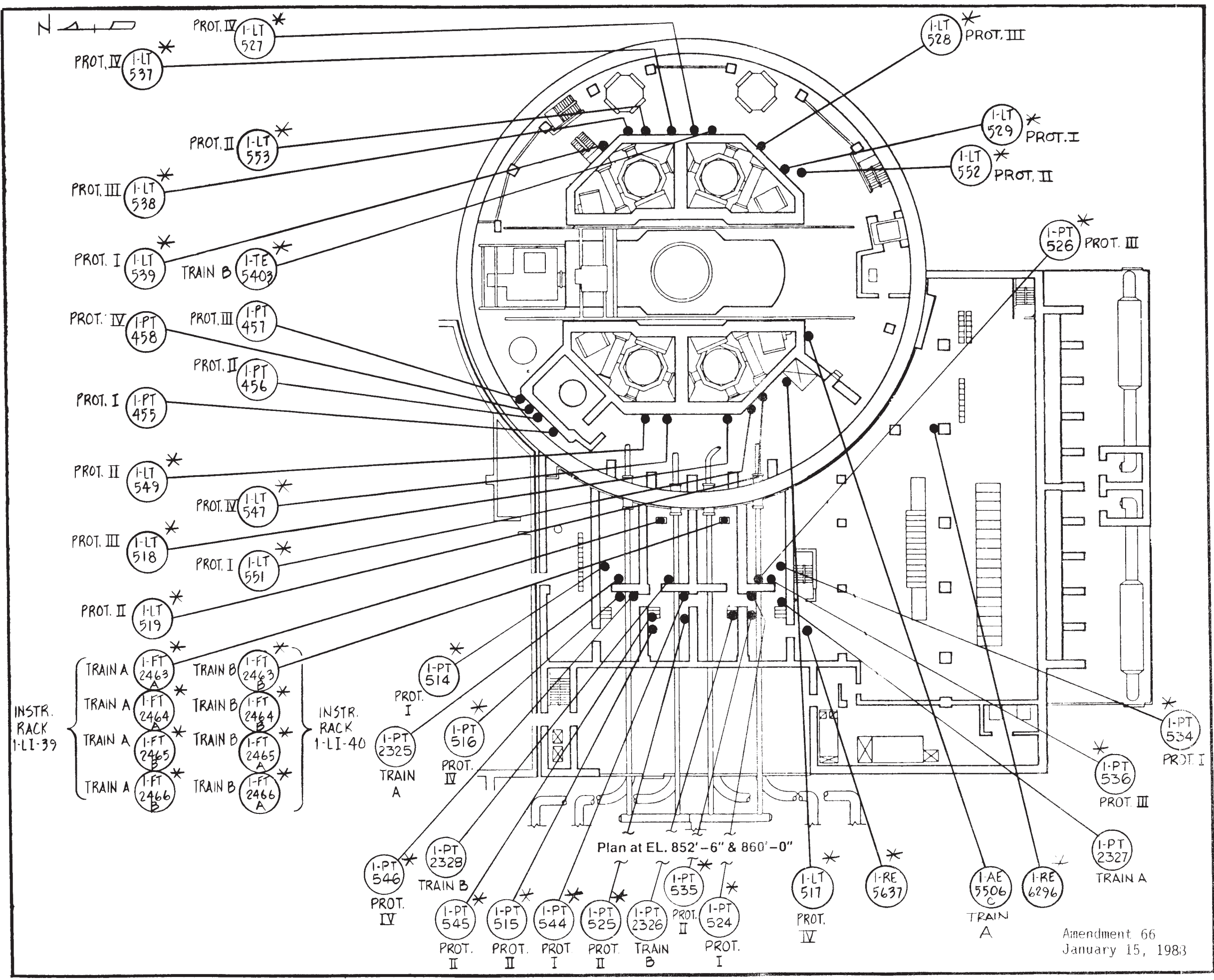
PLAN AT EL 842'-0"

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COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

LOCATION OF CLASS 1E INSTRUMENTS  
AND ACCIDENT MONITORING INSTRUMENTS  
UNIT 1 CONTAINMENT BUILDING  
PLAN AT EL 842'-0"

FIGURE 7.1-3 (SH 05A OF 36)



**Plan at Elevations 852'-6" & 860'-0"**

- 1-FT-2463A Aux FW to Stm Gen 1
- 1-FT-2463B Aux FW to Stm Gen 1
- 1-FT-2464A Aux FW to Stm Gen 2
- 1-FT-2464B Aux FW to Stm Gen 2
- 1-FT-2465A Aux FW to Stm Gen 3
- 1-FT-2465B Aux FW to Stm Gen 3
- 1-FT-2466A Aux FW to Stm Gen 4
- 1-FT-2466B Aux FW to Stm Gen 4
- 1-RE-5637 MS and FW Area Exh
- 1-RE-6296 High Range Radiation Monitor SWGR RM

- 1-TE-450 Press. Surge Line Temp.
- 1-TE-453 PRZR Liquid Temp
- 1-PT-455 PRZR Pressure
- 1-PT-456 PRZR Pressure
- 1-PT-457 PRZR Pressure
- 1-PT-458 PRZR Pressure
- 1-LT-517 SG #1 Level Narrow Range
- 1-LT-518 SG #1 Level Narrow Range
- 1-LT-519 SG #1 Level Narrow Range
- 1-LT-527 SG #2 Level Narrow Range
- 1-LT-528 SG #2 Level Narrow Range
- 1-LT-529 SG #2 Level Narrow Range
- 1-LT-537 SG #3 Level Narrow Range
- 1-LT-538 SG #3 Level Narrow Range
- 1-LT-539 SG #3 Level Narrow Range
- 1-LT-547 SG #4 Level Narrow Range
- 1-LT-549 SG #4 Level Narrow Range
- 1-LT-551 SG #1 Level Narrow Range
- 1-LT-552 SG #2 Level Narrow Range
- 1-LT-553 SG #3 Level Narrow Range
- 1-TE-5403 CNTMT. Temp El 865' - 0"
- 1-AE-5506C H<sub>2</sub> Monitor EL 864' - 0"
- 1-PT-514 SG LP1 Stm Press
- 1-PT-515 SG LP1 Stm Press
- 1-PT-516 SG LP1 Stm Press
- 1-PT-524 SG LP2 Stm Press
- 1-PT-525 SG LP2 Stm Press
- 1-PT-526 SG LP2 Stm Press
- 1-PT-534 SG LP3 Stm Press
- 1-PT-535 SG LP3 Stm Press
- 1-PT-536 SG LP3 Stm Press
- 1-PT-544 SG LP4 Stm Press
- 1-PT-545 SG LP4 Stm Press
- 1-PT-546 SG LP4 Stm Press
- 1-PT-2325 Loop 1 Main Steam
- 1-PT-2326 Loop 2 Main Steam
- 1-PT-2327 Loop 3 Main Steam
- 1-PT-2328 Loop 4 Main Steam

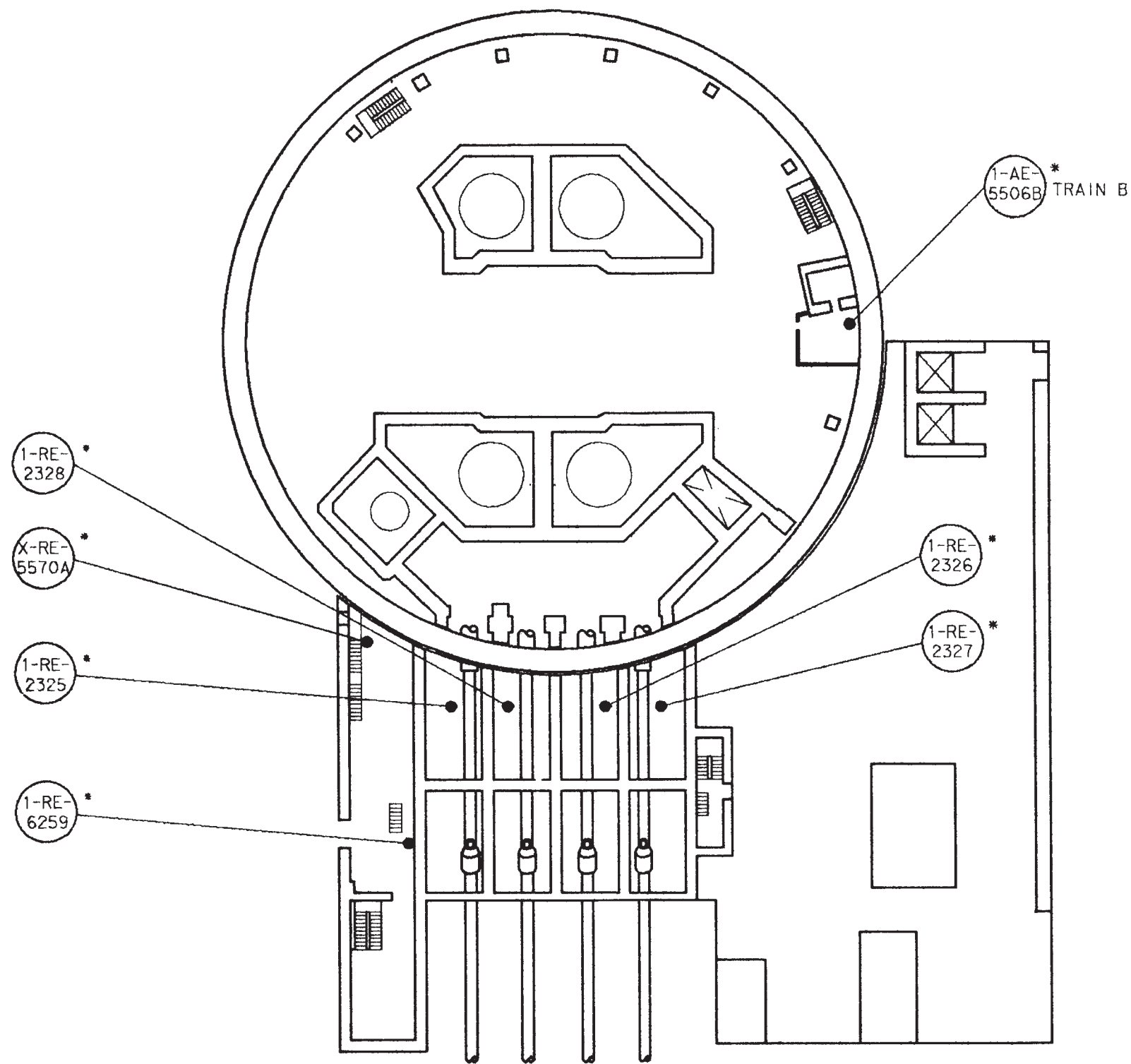
**COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2**

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Unit 1  
Containment & Safeguard Buildings  
Plans at EL 852' 6" & 860' 0"

Figure No. 7.1-3 (Sh. 6 of 36)

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Plan at EL. 873'-6"

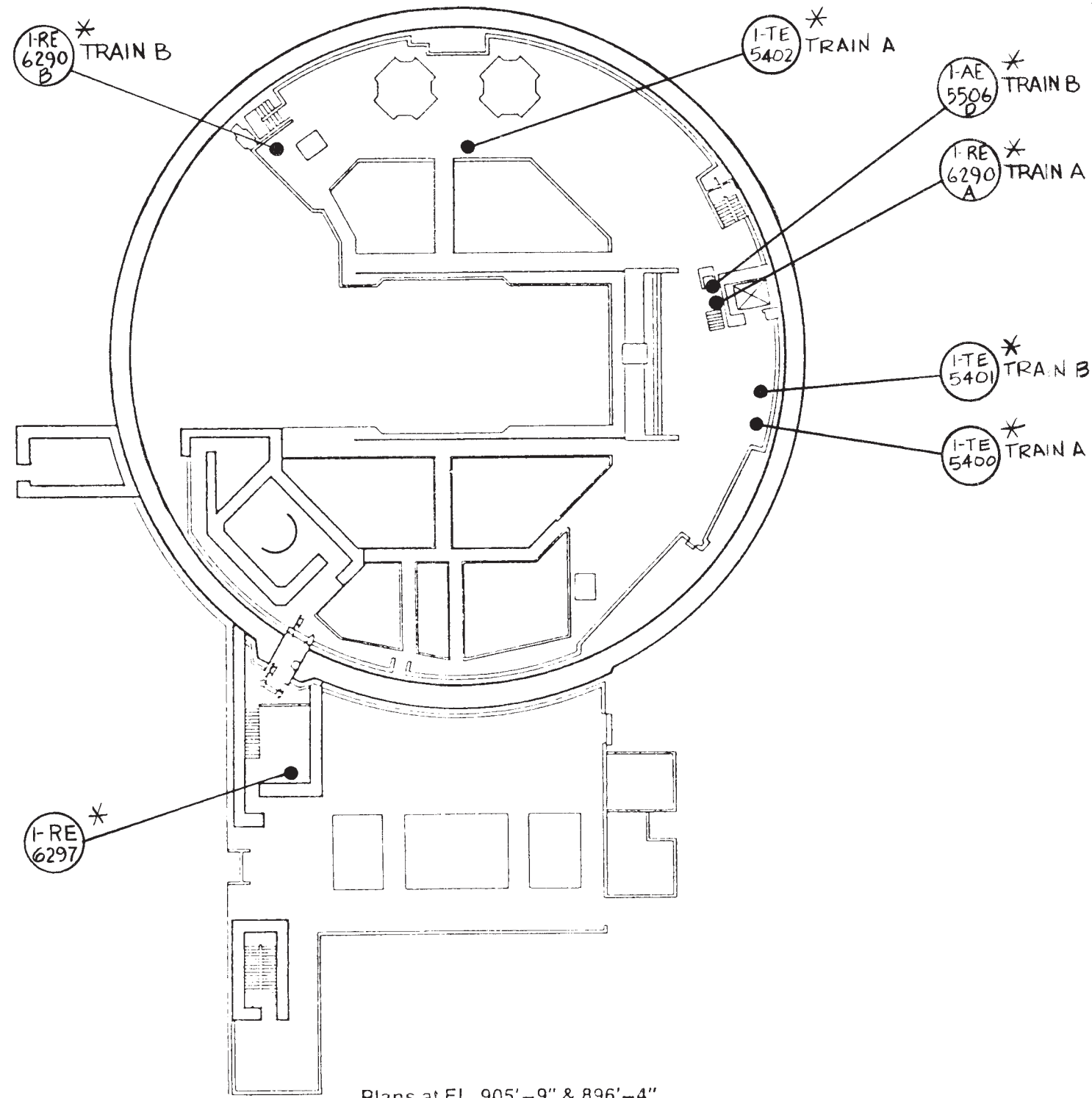
PLANS AT ELEVATIONS 873'-6"

- 1-RE-2325 MSL MONITOR NUMBER 1
- 1-RE-2326 MSL MONITOR NUMBER 2
- 1-RE-2327 MSL MONITOR NUMBER 3
- 1-RE-2328 MSL MONITOR NUMBER 4
- X-RE-5570A WIDE RANGE GAS MONITOR  
S PLANT VENT STACK
- 1-RE-6259 LOW RANGE AREA MONITOR  
PLANT VENT STACK SAMPLE
- 1-AE-5506B H<sub>2</sub> MONITOR EL 877'-0"

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

LOCATION OF CLASS 1E INSTRS  
AND ACCIDENT MONITORING INSTRS  
UNIT 1  
CONTAINMENT AND SAFEGUARDS BUILDINGS  
PLANS AT EL 873'-6"

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Plans at Elevations 905'-9",  
896'-4"

- |            |   |
|------------|---|
| 1-TE-5400  | CNTMT Temp EL 1001' 0"                            |
| 1-TE-5401  | CNTMT Temp EL 1001' 0"                            |
| 1-TE-5402  | CNTMT Temp EL 909' 0"                             |
| 1-AE-5506D | H2 Monitor EL 910' 0"                             |
| 1-RE-6290A | High Range Radiation Monitor<br>CNTMT EL Area 905 |
| 1-RE-6290B | High Range Radiation Monitor<br>CNTMT E. Wall     |
| 1-RE-6297  | High Range Area Monitor<br>Emer Air Lock          |

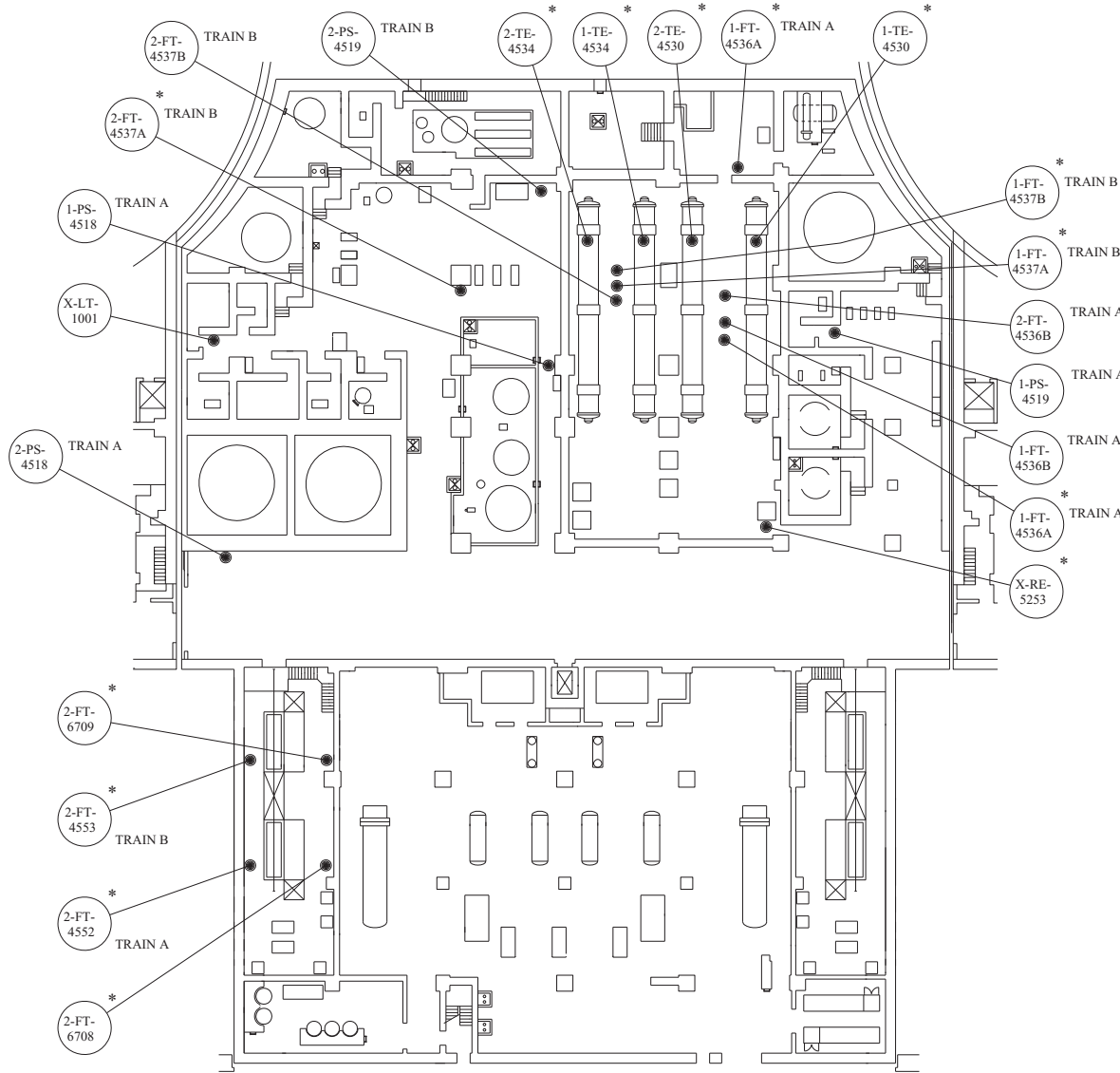
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FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Containment & Safeguard Buildings  
Plans at EL 905' 9" & 896' 4"

Figure No. 7.1-3 (Sh. B of 36)

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PLAN AT ELEVATION 778'-0"

PLAN AT ELEVATION 773'-0"

X-LT-1001	WASTE HOLDUP TANK LEVEL
1-PS-4518	CCW SUPPLY HDR 2 PRESS LO
1-PS-4519	CCW SUPPLY HDR 1 PRESS HI
1-TE-4530	CCW HEADER TEMP
1-TE-4534	CCW HEADER TEMP
1-FT-4536A	CCW HEAT EX 01 TO COMP CIRS
1-FT-4536B	CCW LOOP 01 ELECTRIC
1-FT-4537A	CCW HEAT EX 02 TO COMP CIRS
1-FT-4537B	CCW LOOP 02 ELECTRIC
X-RE-5253	LIQUID WASTE MONITOR
2-PS-4518	CCW SUPPLY HDR 2 PRESS LO
2-PS-4519	CCW SUPPLY HDR 1 PRESS HI
2-TE-4530	CCW HEADER TEMP
2-TE-4534	CCW HEADER TEMP
2-FT-4536A	CCW HEAT EX 01 TO COMP CIRS
2-FT-4536B	CCW LOOP 01 ELECTRIC
2-FT-4537A	CCW HEAT EX 02 TO COMP CIRS
2-FT-4537B	CCW LOOP 02 ELECTRIC
2-PT-4552	SAFETY CHILLER 05 REFRIG PRESS
2-PT-4553	SAFETY CHILLER 06 REFRIG PRESS
2-FT-6708	SAFETY CHILLER 05 RETURN FLOW
2-FT-6709	SAFETY CHILLER 06 RETURN FLOW

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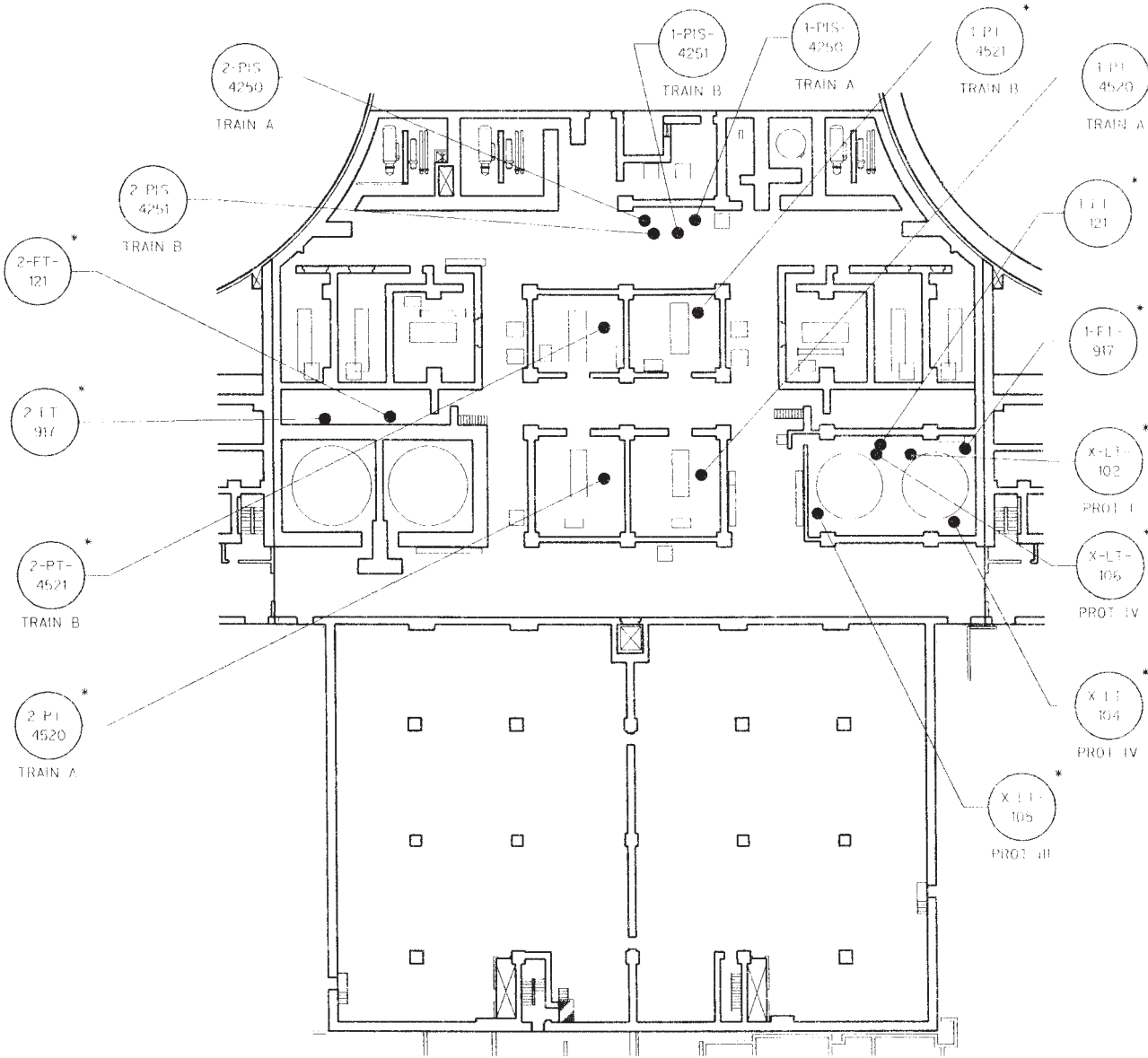
August 1, 1996

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

LOCATION OF CLASS 1E INSTRUMENTS  
AND ACCIDENT MONITORING INSTRUMENTS  
AUXILIARY AND CONTROL BUILDING  
PLAN AT EL 778'-0" AND 790'-6"

FIGURE 7.1-3 (SH 09 OF 36)





PLAN AT EL 807'-0" AND 818'-6"

PLAN AT ELEVATIONS 807'-0" AND 818'-6"

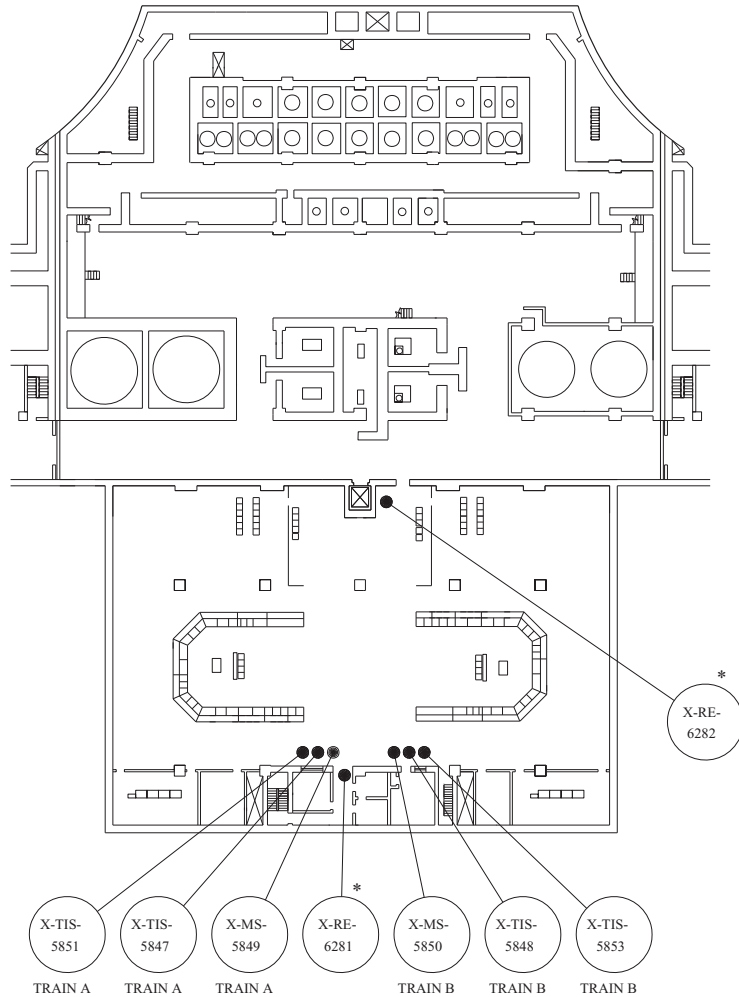
- X-LT-102 BORIC ACID TANK #1
- X-LT-104 BORIC ACID TANK #1
- X-LT-105 BORIC ACID TANK #2
- X-LT-106 BORIC ACID TANK #2
  
- F-FI-121 CHARGING LINE
- F-FI-917 CHARGING PMP DISCHARGE
- 1-PIS-4250 SW TRN SPLY HDR PRESS I/O
- 1-PIS-4251 SW TRN A SPLY HDR PRESS I/O
- 1-PT-4520 CW PMP NUMBER 1 DISCH
- 1-PT-4521 CW PMP NUMBER 2 DISCH
  
- 2-FI-0121 CHARGING LINE
- 2-FI-0917 CHARGING PUMP DISCHARGE
- 2-PIS-4250 SW TRN B SPLY HDR PRESS
- 2-PIS-4251 SW TRN A SPLY HDR PRESS
- 2-PT-4520 CW PUMP NUMBER 1 DISCH
- 2-PT-4521 CW PUMP NUMBER 2 DISCH

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COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

LOCATION OF CLASS I E INSTRS.  
AND ACCIDENT MONITORING INSTRS.  
AUXILIARY AND ELECTRICAL  
CONTROL BUILDINGS  
PLANS AT EL. 807'-0" AND 818'-6"

FIGURE 7.1-3 (SH 10 OF 36)



PLAN AT EL. 830'-0" AND 831'-6"

PLAN AT ELEVATIONS 830'-0" AND 831'-6"

- X-TIS-5847 CONTROL RM A/C UNITS 1 AND 2 HI-LO
- X-TIS-5848 CONTROL RM A/C UNITS 3 AND 4 HI-LO
- X-MS-5849 CONTROL RM A/C UNITS 1 AND 2 HUMID
- X-MS-5850 CONTROL RM A/C UNITS 3 AND 4 HUMID
- X-TIS-5851 CONTROL RM A/C UNITS 1 AND 2 HI-HI/LO-LO
- X-TIS-5853 CONTROL RM A/C UNITS 3 AND 4 HI-HI/LO-LO
- X-RE-6281 LOW RANGE AREA MONITOR CR WEST WALL
- X-RE-6282 LOW RANGE AREA MONITOR CR EAST WALL

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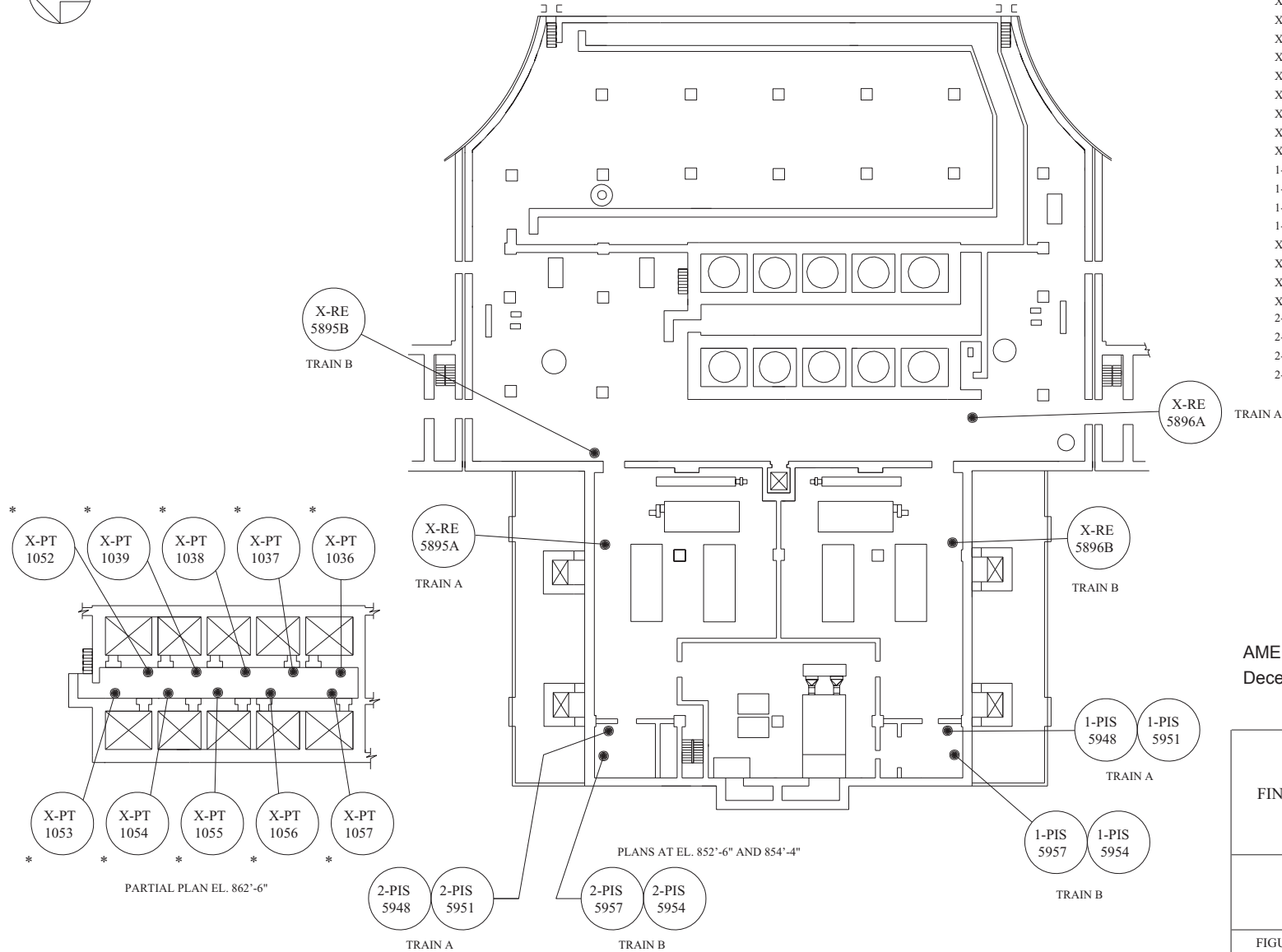
COMANCHE PEAK S E S	
FINAL SAFETY ANALYSIS REPORT	
UNITS 1 AND 2	
LOCATION OF CLASS 1E INSTRS. AND ACCIDENT MONITORING INSTRS. AUXILIARY AND ELECTRICAL CONTROL BUILDINGS PLANS AT EL. 830'-0" AND 831'-6"	
FIGURE 7.1-3	(SH 11 OF 36)





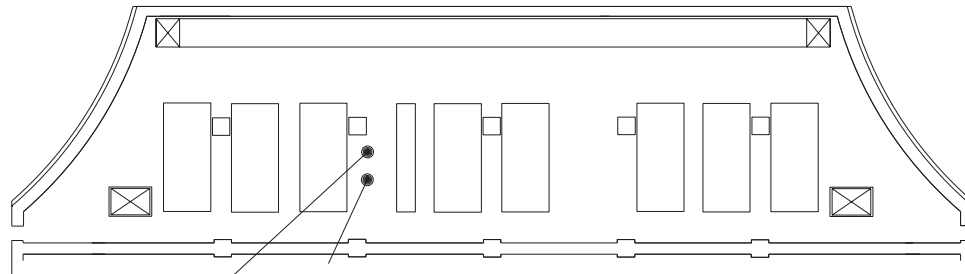
PLAN AT ELEVATIONS 852'-6" AND 854'-4"

- X-PT-1036 GAS DECAY TANK 1
- X-PT-1037 GAS DECAY TANK 2
- X-PT-1038 GAS DECAY TANK 3
- X-PT-1039 GAS DECAY TANK 4
- X-PT-0152 GAS DECAY TANK 5
- X-PT-1053 GAS DECAY TANK 6
- X-PT-1054 GAS DECAY TANK 7
- X-PT-1055 GAS DECAY TANK 8
- X-PT-1056 GAS DECAY TANK 9
- X-PT-1057 GAS DECAY TANK 10
- 1-PIS-5948 BATT RM 1-1 EX FAN 07 LO
- 1-PIS-5951 BATT RM 1-1 EX FAN 08 LO
- 1-PIS-5954 BATT RM 1-2 EX FAN 09 LO
- 1-PIS-5957 BATT RM 1-2 EX FAN 10 LO
- X-RE-5895A CR VENT N. INTK MON
- X-RE-5895B CR VENT N. INTK MON
- X-RE-5896A CR VENT S. INTK MON
- X-RE-5896B CR VENT S. INTK MON
- 2-PIS-5948 BATT RM 2-1 EX FAN 07 LO
- 2-PIS-5951 BATT RM 2-1 EX FAN 08 LO
- 2-PIS-5954 BATT RM 2-2 EX FAN 09 LO
- 2-PIS-5957 BATT RM 2-2 EX FAN 10 LO



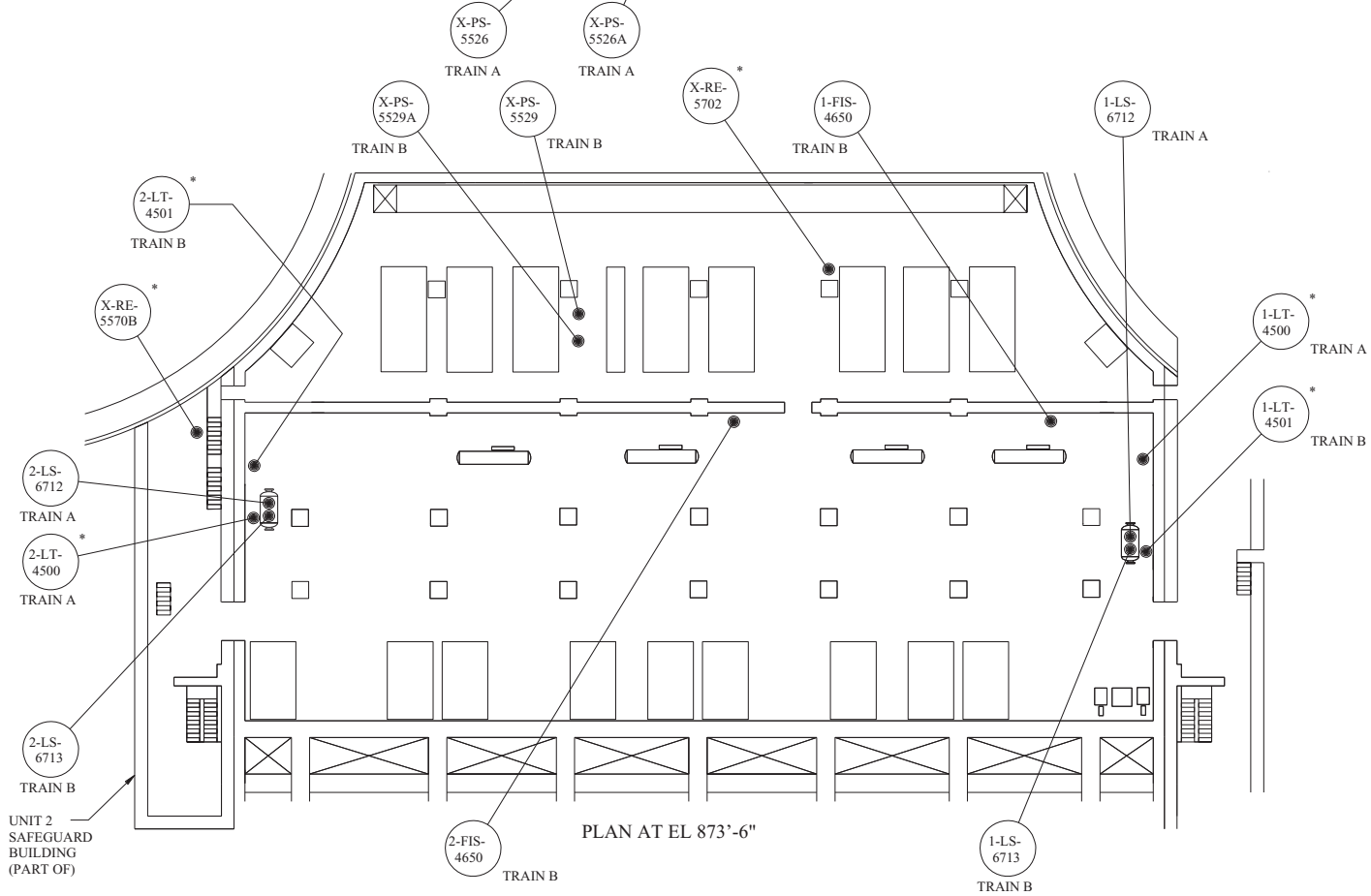
AMENDMENT 100  
December 18, 1992

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRS. AND ACCIDENT MONITORING INSTRS. AUXILIARY AND ELECTRICAL CONTROL BUILDINGS PLANS AT EL. 852'-6" AND 854'-4"</p>
<p>FIGURE 7.1-3 (SH 12 OF 36)</p>



PARTIAL PLAN AT ELEVATION 886'-6"

- PLAN AT ELEVATION 873'-6"
- 1-LT-4500 CCW SURGE TANK
  - 1-LT-4501 CCW SURGE TANK
  - 1-FIS-4650 VENT CHILLERS CCW FLO HI
  - X-PS-5529 CNTMT HYDRO PURGE AIR EXH TO FAN 2 PRESS HI
  - X-PS-5529A CNTMT HYDRO PURGE AIR EXH TO FAN 2 PRESS HI-HI



PLAN AT EL 873'-6"

- 1-LS-6712 EXPANSION TANK LVL HI-LO
- 1-LS-6713 EXPANSION TANK LVL HI-LO
- X-RE-5570B WIDE RANGE GAS MONITOR N PLANT VENT STACK
- X-RE-5702 HVAC EQUIP ROOM VENT AIR RADIATION MONITOR
- 2-LT-4500 CCW SURGE TANK
- 2-LT-4501 CCW SURGE TANK
- 2-FIS-4650 VENT CHILLER CCW FLOW HI
- 2-LS-6712 EXPANSION TANK LVL HI-LO
- 2-LS-6713 EXPANSION TANK LVL HI-LO

PARTIAL PLAN AT ELEVATION 886'-6"

- X-PS-5526 CNTMT H PURGE AIR EXH TO FAN 01 HI
- X-PS-5526A CNTMT H PURGE AIR EXH TO FAN 01 HI-HI

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**COMANCHE PEAK S E S**

**FINAL SAFETY ANALYSIS REPORT**

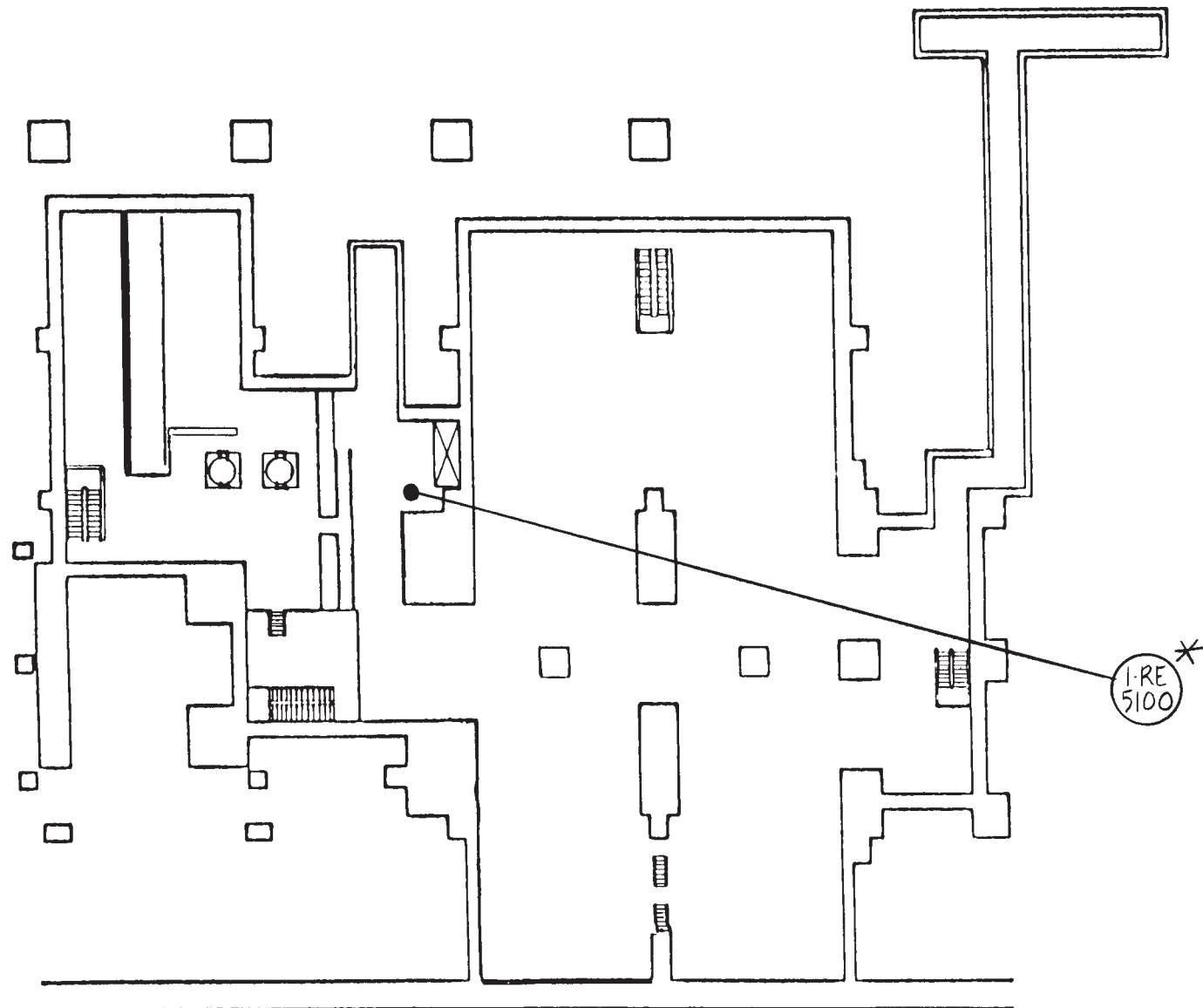
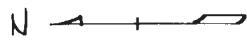
**UNITS 1 AND 2**

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LOCATION OF CLASS 1E INSTRUMENTS  
AND ACCIDENT MONITORING INSTRUMENTS  
AUXILIARY BUILDING  
PLANS AT EL 873'-6" AND 886'-6"

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FIGURE 7.1-3 (SH 13 OF 36)



Plan at EL. 755'-4" & 758'-3"

Partial Plan at Elevations 755'-4" & 758'-3"

1-RE-5100 Turbine Building Drains Monitor

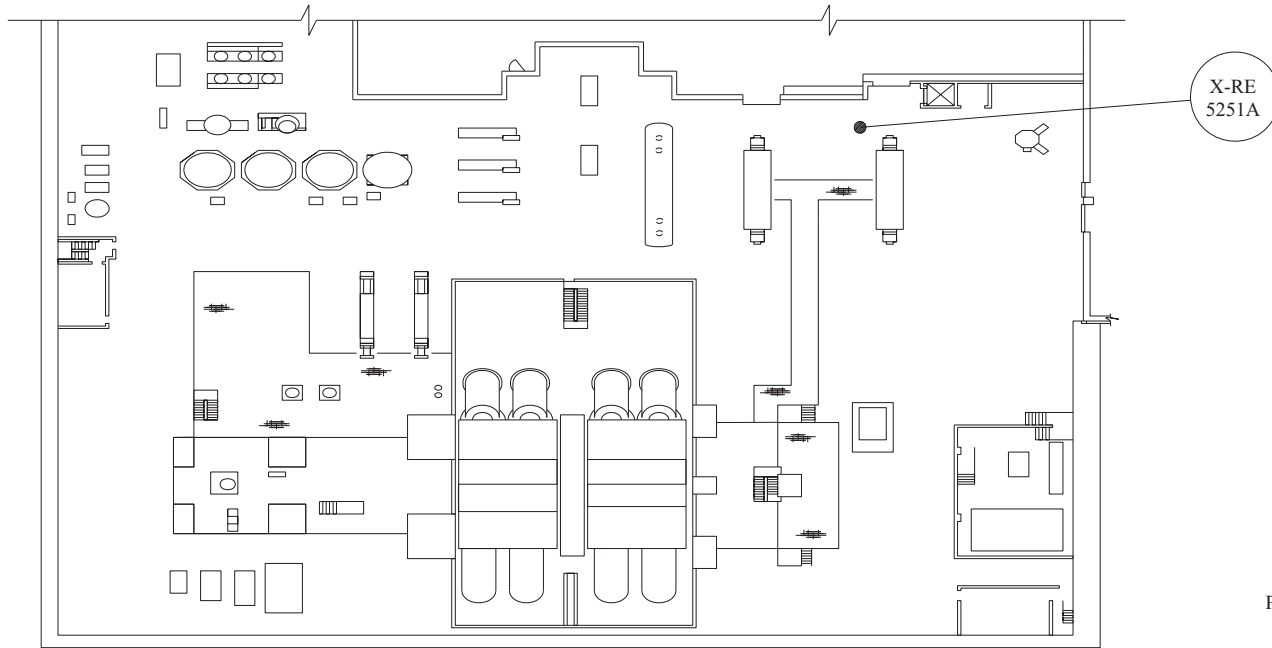
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COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Unit 1  
Turbine Building  
Plans at EL 755' 4" & 758' 3"

Figure No. 7.1-3 (Sh. 14 of 36)



X-RE  
5251A

PLAN AT EL 778'-0"  
(BASEMENT FLOOR PLAN)

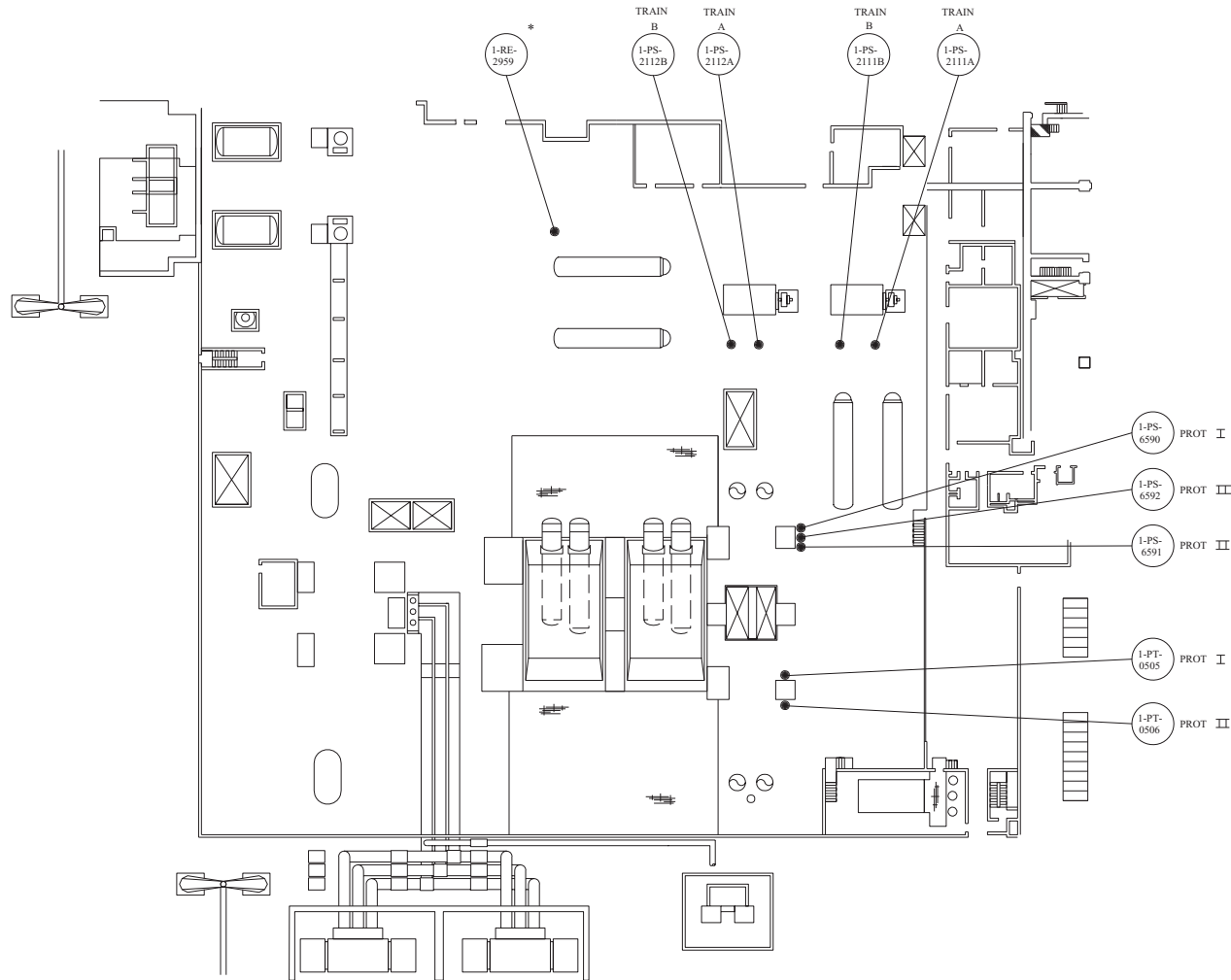
PLAN AT ELEVATION 778'-0"

- 1. X-RE-5251A LIQUID WASTE MONITOR

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRS. AND ACCIDENT MONITORING INSTRS. UNIT 1 TURBINE BUILDING PLAN AT EL 778'-0"</p>
<p>FIGURE 7.1-3 (SH 15 OF 36)</p>

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August 2, 1999



PLAN AT EL 803'-0" AND 810'-6"

1-PS-6590	TURBINE GEN HYDRO
1-PS-6591	TURBINE GEN HYDRO
1-PS-6592	TURBINE GEN HYDRO
1-PS-2111A	FW PUMP 2-A OIL PRESS LO
1-PS-2111B	FW PUMP 2-A OIL PRESS LO
1-PS-2112A	FW PUMP 2-B OIL PRESS LO
1-PS-2112B	FW PUMP 2-B OIL PRESS LO
1-PT-0505	TURBINE IMPULSE PRESS
1-PT-0506	TURBINE IMPULSE PRESS
1-RE-2959	CONDENSER OFF GAS MONITOR

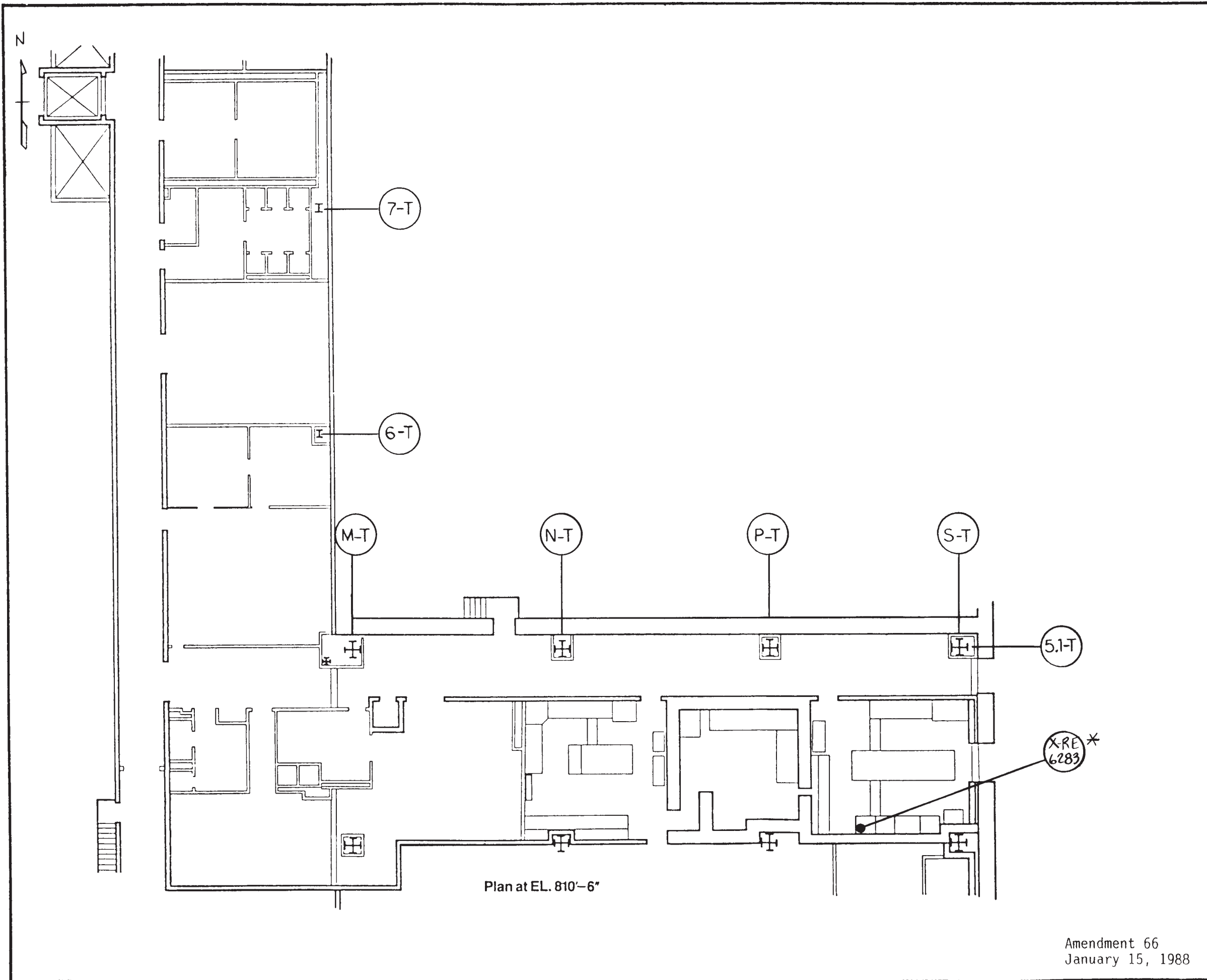
PLAN AT EL 803'-0" AND 810'-6"  
(MEZZANINE FLOOR PLAN)

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COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

LOCATION OF CLASS 1E INSTRUMENTS  
AND ACCIDENT MONITORING INSTRUMENTS  
UNIT 1 TURBINE BUILDING  
PLANS AT EL 803'-0" AND 810'-6"

FIGURE 7.1-3 (SH 16 OF 36)



Plan at Elevation 810'-6"

X-RE-6283 Low Range Area Monitor  
Hot Lab

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Common Area  
Turbine Building  
Plan at EL 810' 6"

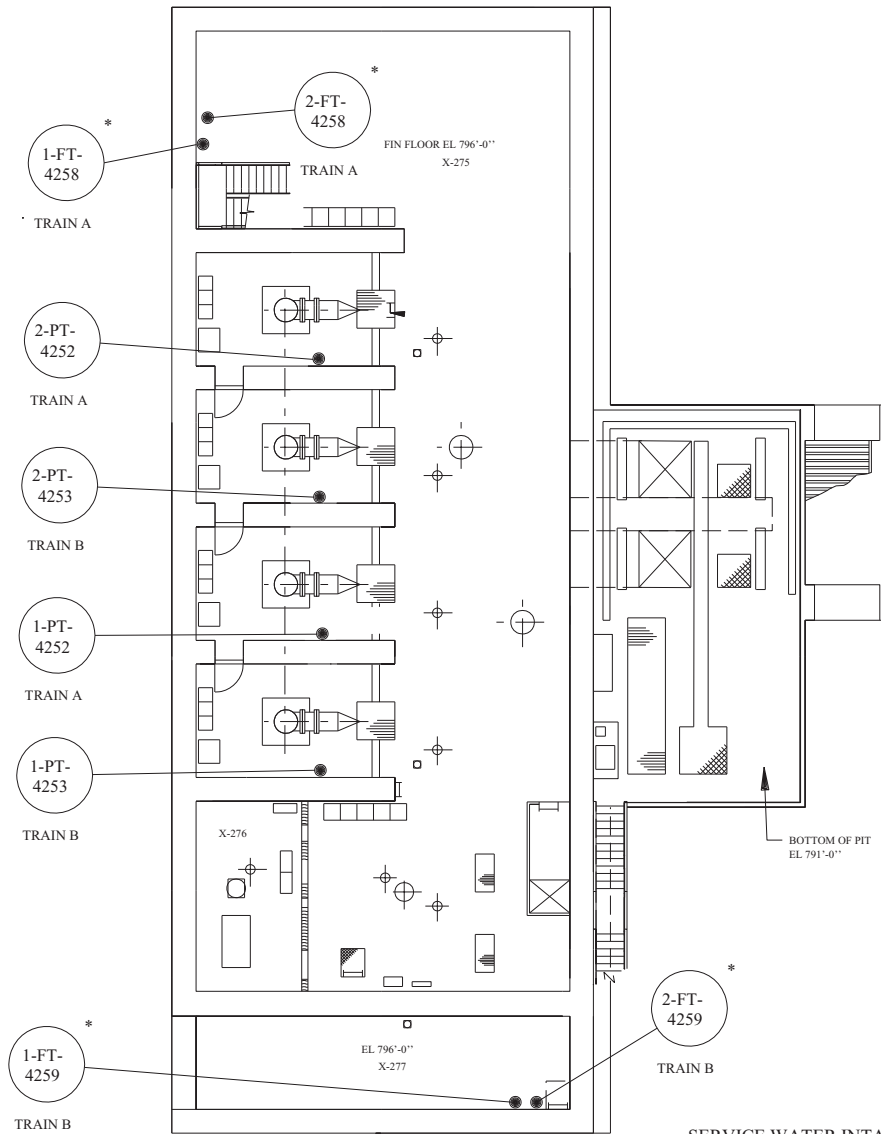
Figure No. 7.1-3 (Sh. 17 of 36)

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CPSSES/FSAR  
FIGURE 7.1-3  
(SHEET 18 OF 36)

78

THIS FIGURE HAS BEEN DELETED



SERVICE WATER INTAKE PLAN AT EL 796'-0"

PLAN AT ELEVATION 796'-0"

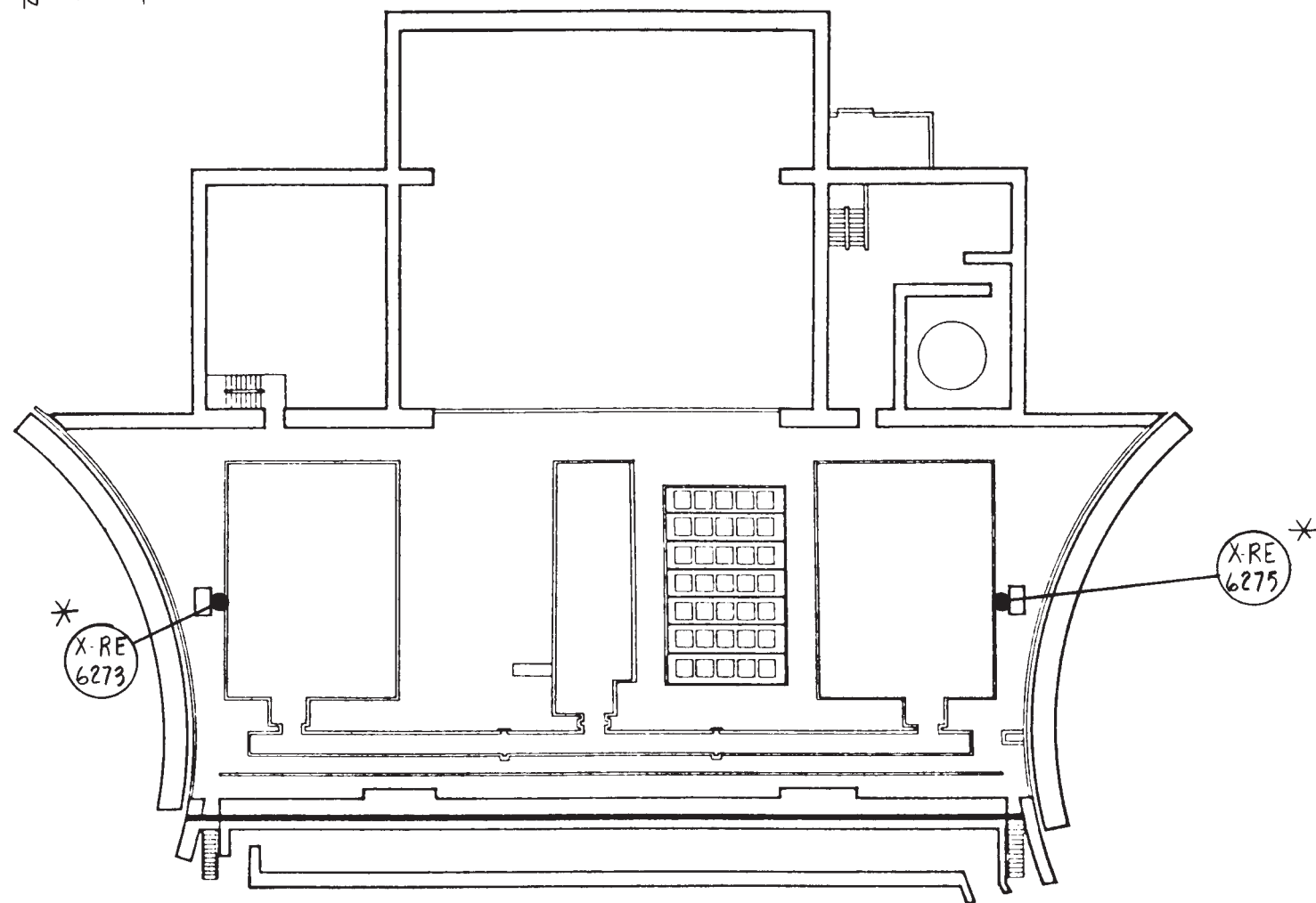
- 1-PT-4252 SSW PUMP 01 DISCH PRESS
- 1-PT-4253 SSW PUMP 02 DISCH PRESS
- 1-FT-4258 SSW PUMP 01 DISCH FLO
- 1-FT-4259 SSW PUMP 02 DISCH FLO
- 2-PT-4252 SSW PUMP 2-01 DISCH PRESS
- 2-PT-4253 SSW PUMP 2-02 DISCH PRESS
- 2-FT-4258 SSW PUMP 2-01 DISCH FLO
- 2-FT-4259 SSW PUMP 2-02 DISCH FLO

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December 18, 1992

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

LOCATION OF SERVICE WATER INTAKE AT EL 796'-0"  
CLASSIFICATION AND MONITORING INSTRUMENTS  
TYPE AND STRUCTURE





Plan at EL. 860'-0"

**Plan at Elevation 860'-0"**

- |           |   |
|-----------|---|
| X-RE-6273 | Low Range Area Monitor<br>SFP 2 N. Wall |
| X-RE-6275 | Low Range Area Monitor<br>SFP 1 S. Wall |

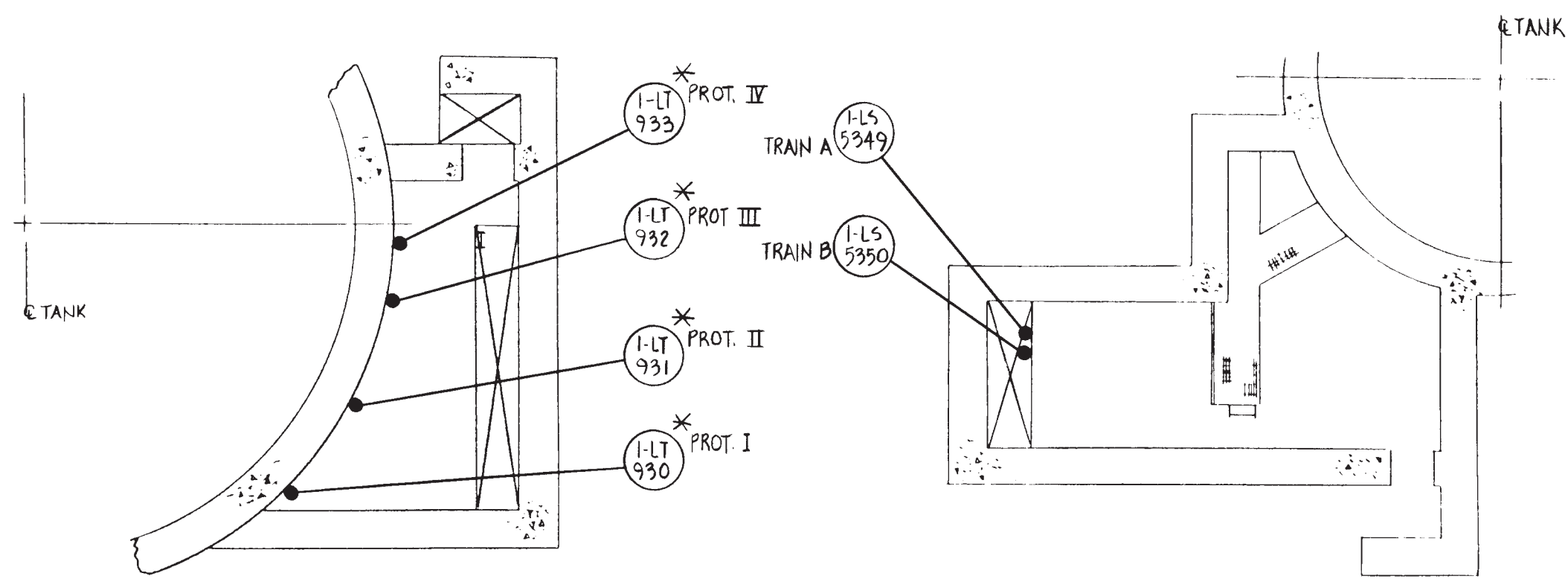
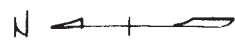
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Fuel Building  
Plan at EL 860' 0"

Figure No. 7.1-3 (Sh. 20 of 36)

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Refueling Water Storage Tank  
CPI-CTATRW-OI

Reactor Make-up Water Storage Tank  
CPI-DDATRM-OI

Plans at EL. 810'-6"

Plan at Elevation 810'-6"

- I-LT-930 Refueling Wtr Storage Tk
- I-LT-931 Refueling Wtr Storage Tk
- I-LT-932 Refueling Wtr Storage Tk
- I-LT-933 Refueling Wtr Storage Tk
- I-LS-5349 Reactor Make-Up Wtr Storage Tk
- I-LS-5350 Reactor Make-Up Wtr Storage Tk

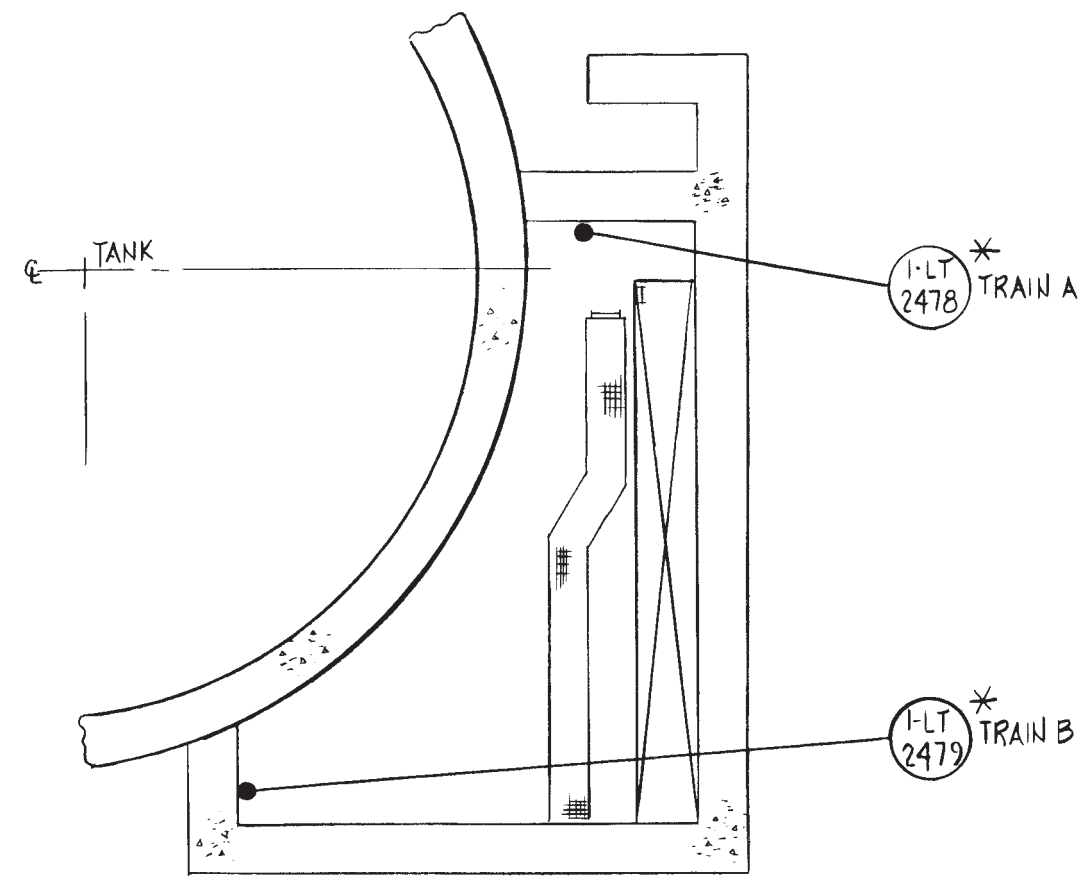
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Unit 1  
Yard  
Plan at EL 810' 6"

Figure No. 7.1-3 (Sh. 21 of 36)

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Condensate Water Storage Tank

CPI-AFATCS-01

**Plan at Elevation 810'-6"**

I-LT-2478    Condensate Storage Tank  
I-LT-2479    Condensate Storage Tank

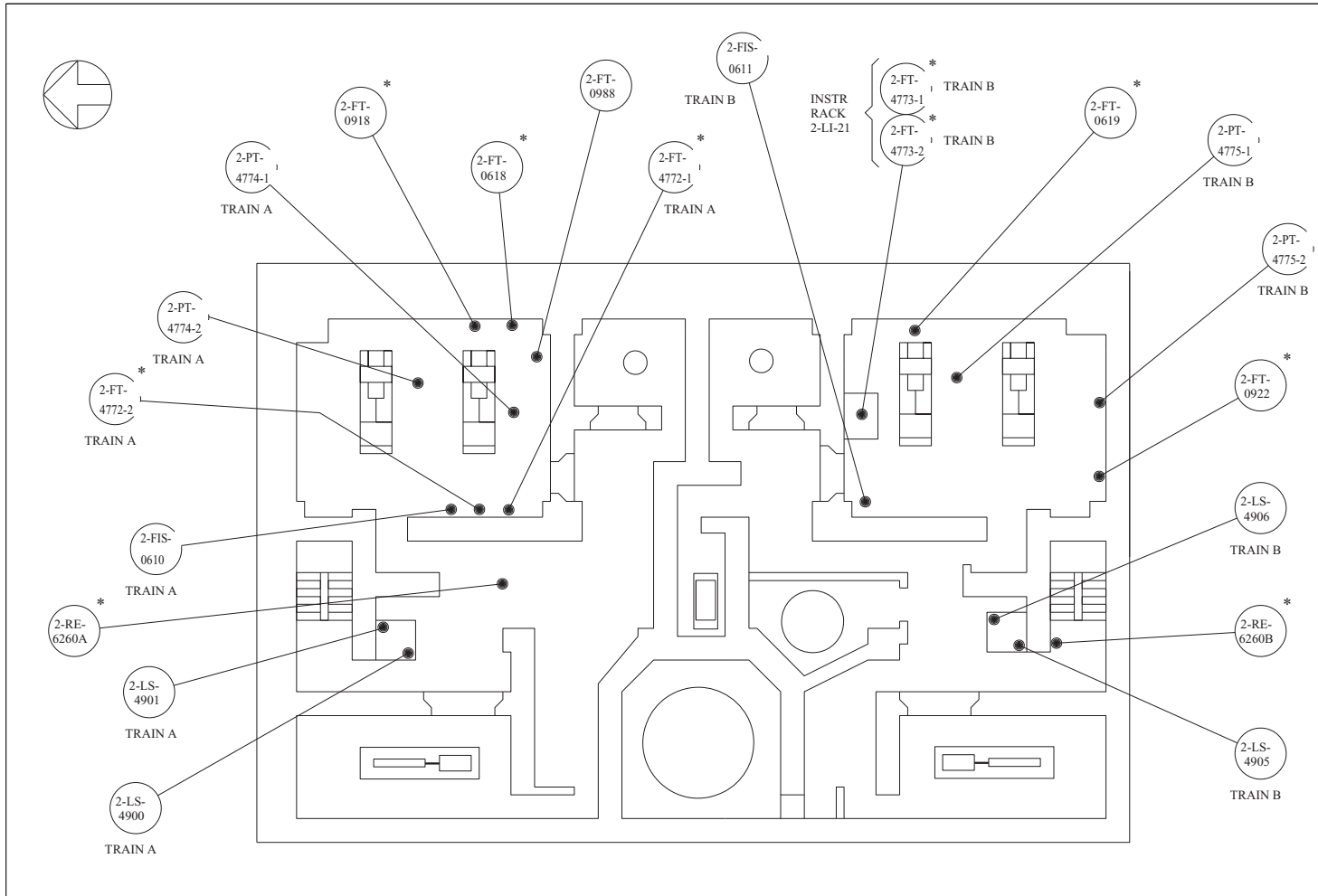
**COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2**

Location of Class 1E Instrs.  
and Accident Monitoring Instrs.

Unit 1  
Yard  
Plan at EL 810' 6"

Figure No. 7.1-3 (Sh. 22 of 36)

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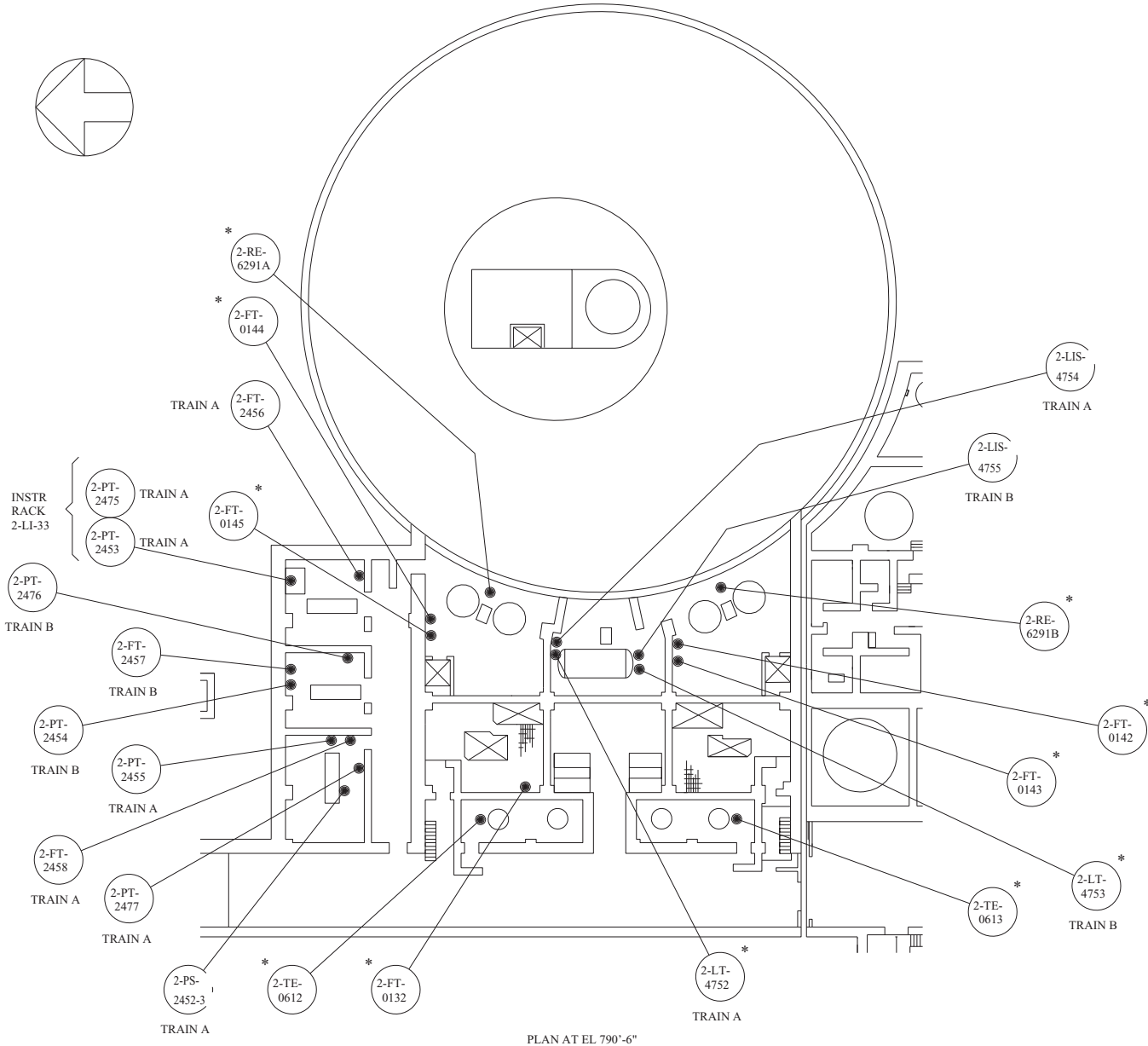
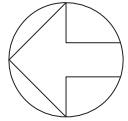
PLAN AT EL 773'-0"

PLAN AT ELEVATION 773'-0"

- 2-FIS-0610 RHR PMP 1 MIN FLOW
- 2-FIS-0611 RHR PMP 2 MIN FLOW
- 2-FT-0618 RHR HX 1 BYP CONT
- 2-FT-0619 RHR HX 2 BYP CONT
- 2-FT-0918 SI PMP 1 DISCH
- 2-FT-0922 SI PMP 2 DISCH
- 2-FT-0988 RHR PMP DISCH
- 2-FT-4772-1 CONTMT SPRAY PMP 1 DISCH
- 2-FT-4772-2 CONTMT SPRAY PMP 3 DISCH
- 2-FT-4773-1 CONTMT SPRAY PMP 2 DISCH
- 2-FT-4773-2 CONTMT SPRAY PMP 4 DISCH
- 2-PT-4774-1 CONTMT SPRAY PMP 1 DISCH
- 2-PT-4774-2 CONTMT SPRAY PMP 3 DISCH
- 2-PT-4775-1 CONTMT SPRAY PMP 2 DISCH
- 2-PT-4775-2 CONTMT SPRAY PMP 4 DISCH
- 2-LS-4900 SB FLR DR SUMP 2 LVL HI-1/LO
- 2-LS-4901 SB FLR DR SUMP 1 LVL HI-2
- 2-LS-4905 SB FLR DR SUMP 1 LVL HI-2
- 2-LS-4906 SB FLR DR SUMP 1 LVL HI-2
- 2-RE-6260A HIGH RANGE AREA MONITOR
- 2-RE-6260B RHR PUMP RM TRN A
- 2-RE-6260B HIGH RANGE AREA MONITOR
- 2-RE-6260B RHR PUMP RM TRN B

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<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 SAFEGUARD BUILDING PLAN AT EL 773'-0"</p>
<p>FIGURE 7.1-3 (SH 23 OF 36)</p>



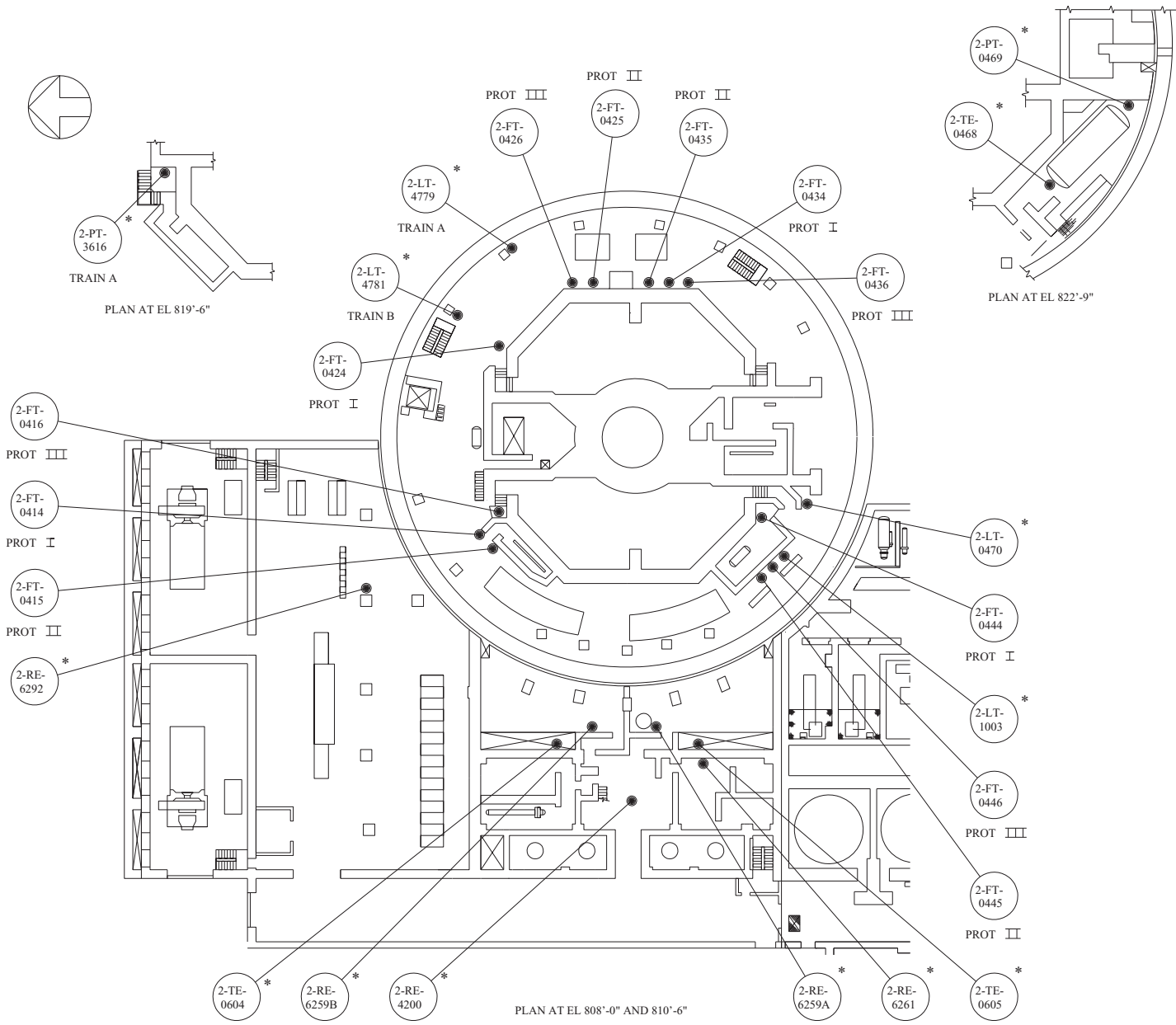
PLAN AT EL 790'-6"

PLAN AT ELEVATION 790'-6"

- 2-FT-0132 RCS HI PRESS LETDOWN FLOW
- 2-FT-0142 RCP 4 SEAL WATER INJ FLOW
- 2-FT-0143 RCP 3 SEAL WATER INJ FLOW
- 2-FT-0144 RCP 2 SEAL WATER INJ FLOW
- 2-FT-0145 RCP 1 SEAL WATER INJ FLOW
- 2-TE-0612 RHR DISCH TEMP (PUMP 1)
- 2-TE-0613 RHR DISCH TEMP (PUMP 2)
- 2-PS-2452-3 AFW PMP TURB LUB OIL PRESS
- 2-PT-2453 MTR DRIVEN AFW PMP 01 DISCH
- 2-PT-2454 MTR DRIVEN AFW PMP 01 DISCH
- 2-PT-2455 TURB DRIVEN AFW PMP DISCH
- 2-FT-2456 MTR DRIVEN AFW PMP 01 DISCH
- 2-FT-2457 MTR DRIVEN AFW PMP 01 DISCH
- 2-FT-2458 MTR DRIVEN AFW PMP DISCH
- 2-PT-2475 MTR DRIVEN AFW PMP 01 SUCT HDR
- 2-PT-2476 MTR DRIVEN AFW PMP 02 SUCT HDR
- 2-PT-2477 TURB DRIVEN AFW PMP SUCT HDR
- 2-LT-4752 CHEM ADD TANK
- 2-LT-4753 CHEM ADD TANK
- 2-LIS-4754 CHEM ADD TANK LEVEL LO
- 2-LIS-4755 CHEM ADD TANK LEVEL LO
- 2-RE-6291A HIGH RANGE AREA MONITOR ISOL VLV TANK TRN A
- 2-RE-6291B HIGH RANGE AREA MONITOR ISOL VLV TANK TRN B

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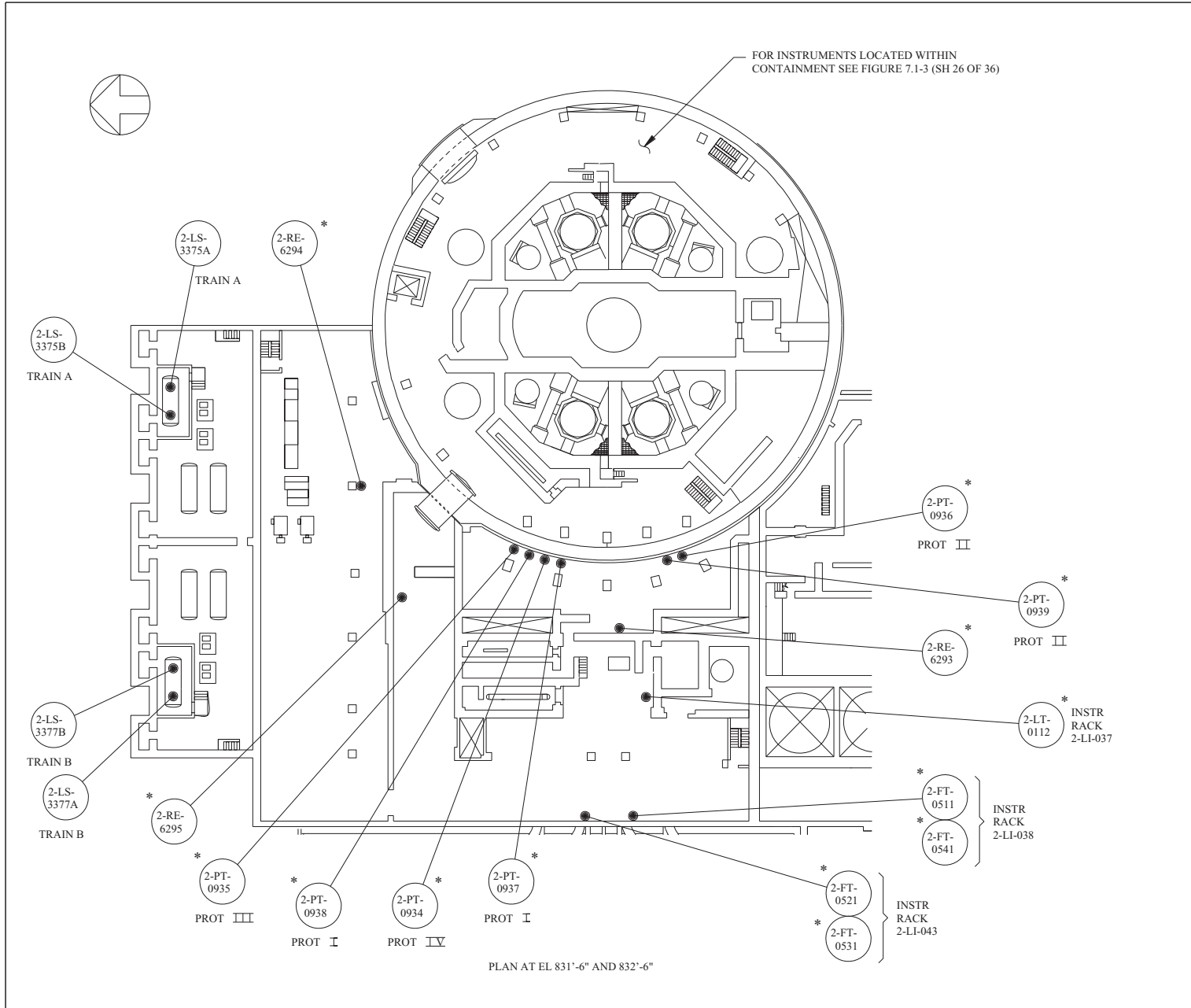
<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 SAFEGUARD BUILDING PLAN AT EL 790'-6"</p>
<p>FIGURE 7.1-3 (SH 23A OF 36)</p>



2-FT-0414	RC FLOW LOOP 1
2-FT-0415	RC FLOW LOOP 1
2-FT-0416	RC FLOW LOOP 1
2-FT-0424	RC FLOW LOOP 2
2-FT-0425	RC FLOW LOOP 2
2-FT-0426	RC FLOW LOOP 2
2-LT-0434	RC FLOW LOOP 3
2-FT-0435	RC FLOW LOOP 3
2-FT-0436	RC FLOW LOOP 3
2-FT-0444	RC FLOW LOOP 4
2-FT-0445	RC FLOW LOOP 4
2-FT-0446	RC FLOW LOOP 4
2-TE-0468	PRZR RELIEF TANK
2-PT-0469	PRZR RELIEF TANK
2-LT-0470	PRZR RELIEF TANK
2-TE-0604	RESIDUAL HX 1 RETURN
2-TE-0605	RESIDUAL HX 2 RETURN
2-LT-1003	RC DRAIN TANK
2-LT-4779	CNTMT LEVEL WIDE RANGE
2-LT-4781	CNTMT LEVEL WIDE RANGE
2-RE-4200	SG BLO DWN MON
2-RE-6259A	HIGH RANGE AREA MONITOR
	PIPE PENET S
2-RE-6259B	HIGH RANGE AREA MONITOR
	PIPE PENET N
2-RE-6261	LOW RANGE AREA MONITOR
	SB SAMPLING RM
2-RE-6292	HIGH RANGE AREA MONITOR
	SWGR RM TRN A
2-PT-3616	RCS WIDE RANGE PRESS

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COMANCHE PEAK S E S	
FINAL SAFETY ANALYSIS REPORT	
UNITS 1 AND 2	
LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 CONTAINMENT AND SAFEGUARD BLDG'S PLANS AT EL 808'-0", 810'-6", 819'-6" AND 822'-9"	
FIGURE 7.1-3 (SH 24 OF 36)	



PLAN AT ELEVATION 831'-6"  
SAFEGUARD BUILDING

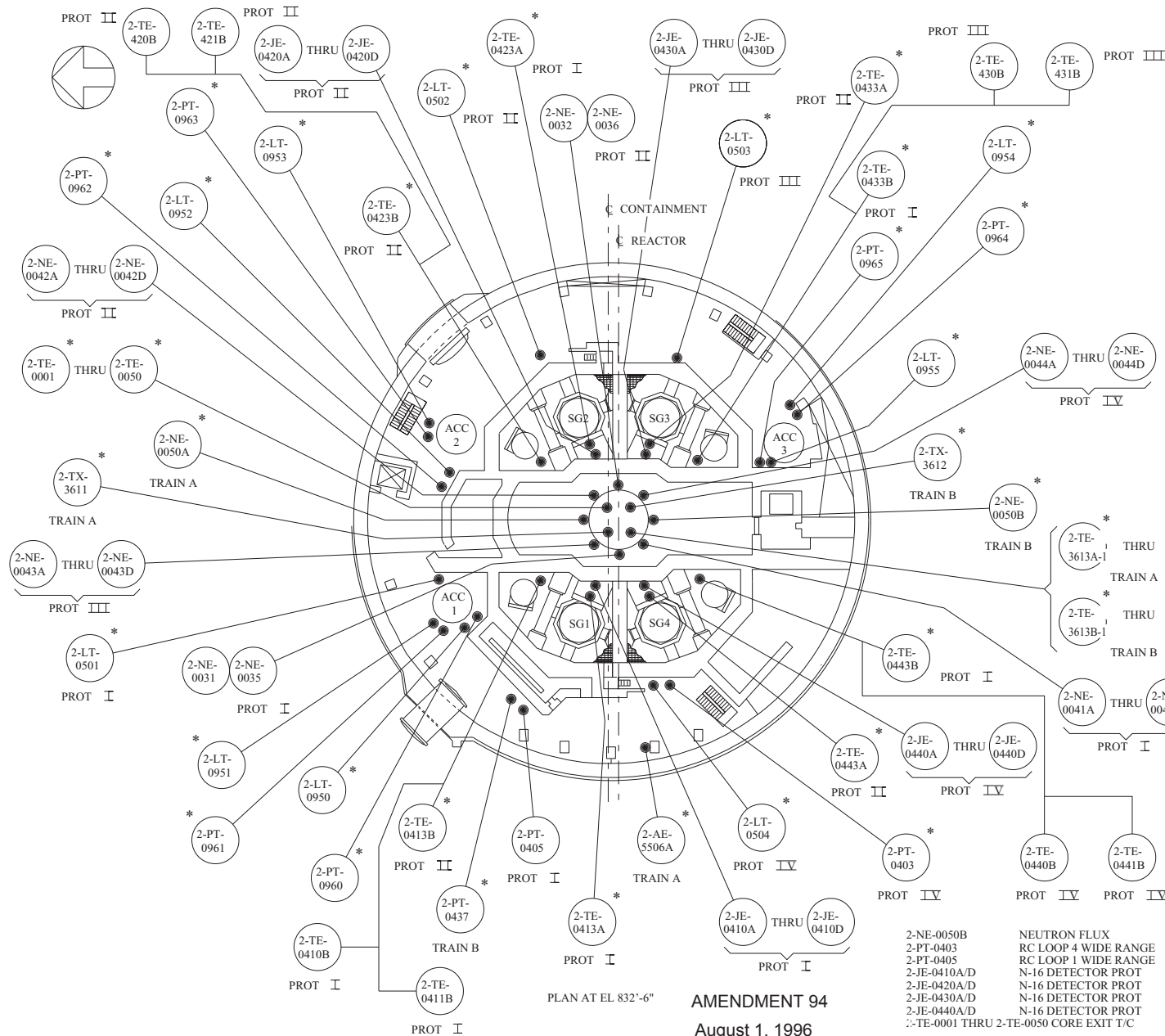
2-LT-0112	VOL CONTROL
2-FT-0511	STM GEN FW FLOW LOOP 1
2-FT-0521	STM GEN FW FLOW LOOP 2
2-FT-0531	STM GEN FW FLOW LOOP 3
2-FT-0541	STM GEN FW FLOW LOOP 4
2-PT-0934	CONTAINMENT PRESS (IR)
2-PT-0935	CONTAINMENT PRESS (IR)
2-PT-0936	CONTAINMENT PRESS (IR)
2-PT-0937	CONTAINMENT PRESS (IR)
2-PT-0938	CONTAINMENT PRESS (WR)
2-PT-0939	CONTAINMENT PRESS (WR)
2-RE-6293	HIGH RANGE AREA MONITOR PIPE PENETRATION
2-RE-6294	HIGH RANGE AREA MONITOR ELEC EQUIP ROOM
2-RE-6295	HIGH RANGE AREA MONITOR CONTAINMENT ACCESS HALL

PLAN AT ELEVATION 844'-0"  
DIESEL GENERATOR BUILDING

2-LS-3375A	D F O DAY TK 1 LVL HI/LO
2-LS-3375B	D F O DAY TK 1 LVL HI/LO
2-LS-3377A	D F O DAY TK 2 LVL HI/LO
2-LS-3377B	D F O DAY TK 2 LVL HI/LO

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<p>COMANCHE PEAK S E S</p> <p>FINAL SAFETY ANALYSIS REPORT</p> <p>UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 SAFEGUARD AND DIESEL GENERATOR BLDG PLANS AT EL 831'-6" AND 844'-0"</p>
<p>FIGURE 7.1-3 (SH 25 OF 36)</p>



PLAN AT ELEVATIONS 832'-6" AND 842'-0"

- 2-TE-0410B SPARE
- 2-TE-0411B NARROW RNG TEMP COLD LEG
- 2-TE-0413A WIDE RNG TEMP HOT LEG
- 2-TE-0413B WIDE RNG TEMP COLD LEG
- 2-TE-0420B SPARE
- 2-TE-0421B NARROW RNG TEMP COLD LEG
- 2-TE-0423A WIDE RNG TEMP HOT LEG
- 2-TE-0423B WIDE RNG TEMP COLD LEG
- 2-TE-0430B SPARE
- 2-TE-0431B NARROW RNG TEMP COLD LEG
- 2-TE-0433A WIDE RNG TEMP HOT LEG
- 2-TE-0433B WIDE RNG TEMP COLD LEG
- 2-TE-0440B SPARE
- 2-TE-0441B NARROW RNG TEMP COLD LEG
- 2-TE-0443A WIDE RNG TEMP HOT LEG
- 2-TE-0443B WIDE RNG TEMP COLD LEG
- 2-LT-0501 SG LOOP 1 WIDE RANGE
- 2-LT-0502 SG LOOP 2 WIDE RANGE
- 2-LT-0503 SG LOOP 3 WIDE RANGE
- 2-LT-0504 SG LOOP 4 WIDE RANGE
- 2-LT-0950 ACCUM TANK 1
- 2-LT-0951 ACCUM TANK 1
- 2-LT-0952 ACCUM TANK 2
- 2-LT-0953 ACCUM TANK 2
- 2-LT-0954 ACCUM TANK 3
- 2-LT-0955 ACCUM TANK 3
- 2-PT-0961 ACCUM TANK 1
- 2-PT-0962 ACCUM TANK 2
- 2-PT-0963 ACCUM TANK 2
- 2-PT-0964 ACCUM TANK 3
- 2-PT-0965 ACCUM TANK 3
- 2-TX-3611 REACTOR COOLANT SUBCOOLING
- 2-TX-3612 REACTOR COOLANT SUBCOOLING
- 2-TE-3613A-1 REACTOR VESSEL LEVEL
- 2-TE-3613A-2 REACTOR VESSEL LEVEL
- 2-TE-3613A-3 REACTOR VESSEL LEVEL
- 2-TE-3613A-4 REACTOR VESSEL LEVEL
- 2-TE-3613A-5 REACTOR VESSEL LEVEL
- 2-TE-3613A-6 REACTOR VESSEL LEVEL
- 2-TE-3613A-7 REACTOR VESSEL LEVEL
- 2-TE-3613A-8 REACTOR VESSEL LEVEL
- 2-TE-3613B-1 REACTOR VESSEL LEVEL
- 2-TE-3613B-2 REACTOR VESSEL LEVEL
- 2-TE-3613B-3 REACTOR VESSEL LEVEL
- 2-TE-3613B-4 REACTOR VESSEL LEVEL
- 2-TE-3613B-5 REACTOR VESSEL LEVEL
- 2-TE-3613B-6 REACTOR VESSEL LEVEL
- 2-TE-3613B-7 REACTOR VESSEL LEVEL
- 2-TE-3613B-8 REACTOR VESSEL LEVEL
- 2-AE-5506A H2 MONITOR EL 836'-0"
- 2-PT-0437 RC LOOP 1 WIDE RANGE
- 2-NE-0031 SOURCE RANGE
- 2-NE-0032 SOURCE RANGE
- 2-NE-0035 INTERM RANGE
- 2-NE-0036 INTERM RANGE
- 2-NE-0041A/D POWER RANGE
- 2-NE-0042A/D POWER RANGE
- 2-NE-0043A/D POWER RANGE
- 2-NE-0044A/D POWER RANGE
- 2-NE-0050A NEUTRON FLUX

PLAN AT EL 832'-6"

AMENDMENT 94

August 1, 1996

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

LOCATION OF CLASS 1E INSTRUMENTS  
AND ACCIDENT MONITORING INSTRUMENTS  
UNIT 2 CONTAINMENT BUILDING  
PLAN AT EL 832'-6"

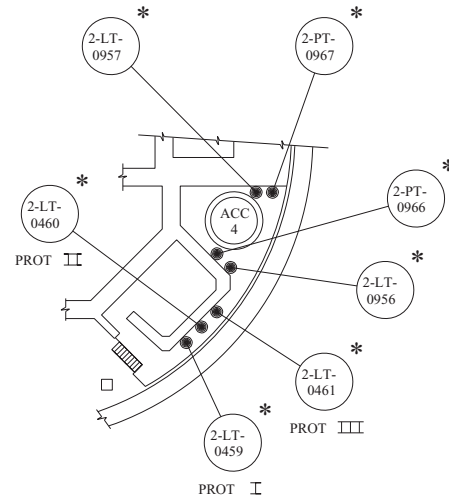
FIGURE 7.1-3 (SH 26 OF 36)





PLAN AT ELEVATION 842'-0"

2-LT-0459	PRZR LEVEL
2-LT-0460	PRZR LEVEL
2-LT-0461	PRZR LEVEL
2-LT-0956	ACCUM TANK 4
2-LT-0957	ACCUM TANK 4
2-PT-0966	ACCUM TANK 4
2-PT-0967	ACCUM TANK 4

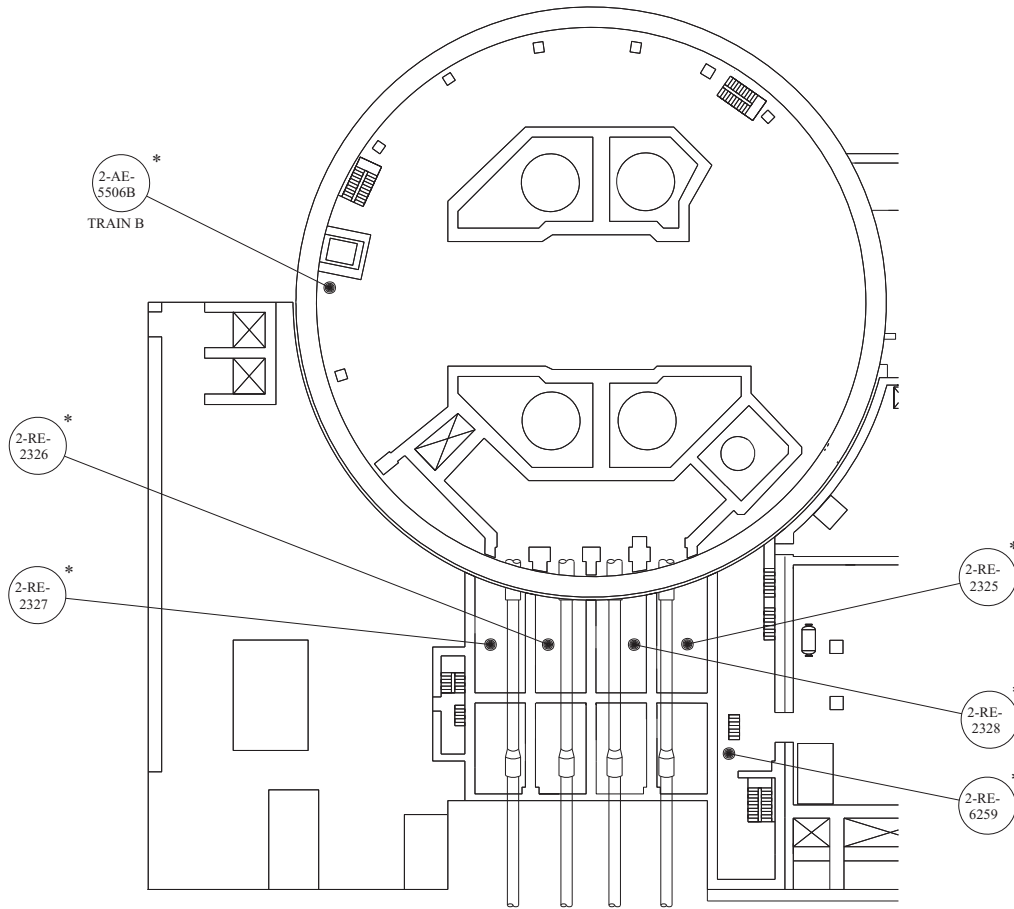


PLAN AT EL 842'-0"

AMENDMENT 100  
December 18, 1992

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 CONTAINMENT BUILDING PLAN AT EL 842'-0"
FIGURE 7.1-3 (SH 26A OF 36)



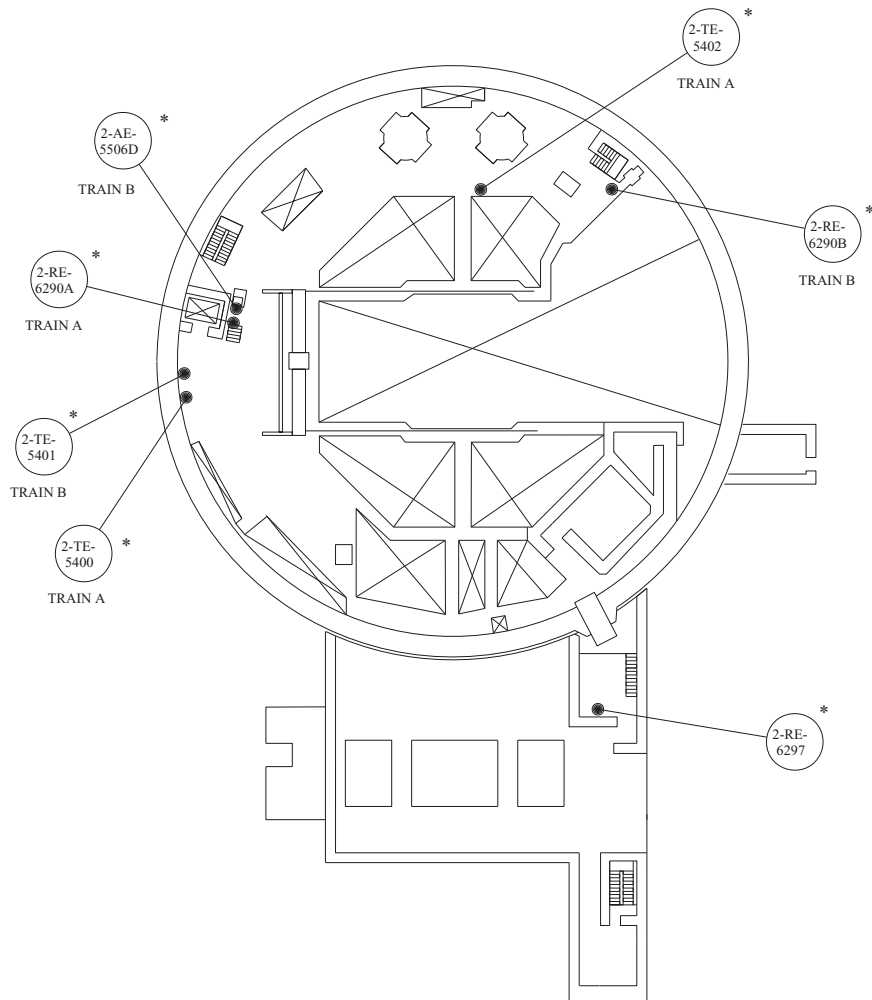


PLAN AT EL 873'-6"

- 2-RE-2325 MSL MONITOR NUMBER 1
- 2-RE-2326 MSL MONITOR NUMBER 2
- 2-RE-2327 MSL MONITOR NUMBER 3
- 2-RE-2328 MSL MONITOR NUMBER 4
  
- 2-RE-6259 LOW RANGE AREA MONITOR  
PLANT VENT STACK SAMPLE
  
- 2-AE-5506B H<sub>2</sub> MONITOR EL 877'-0"

AMENDMENT 100  
December 18, 1992

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 CONTAINMENT AND SAFEGUARD BLDG PLANS AT EL 873'-6"</p>
<p>FIGURE 7.1-3 (SH 28 OF 36)</p>



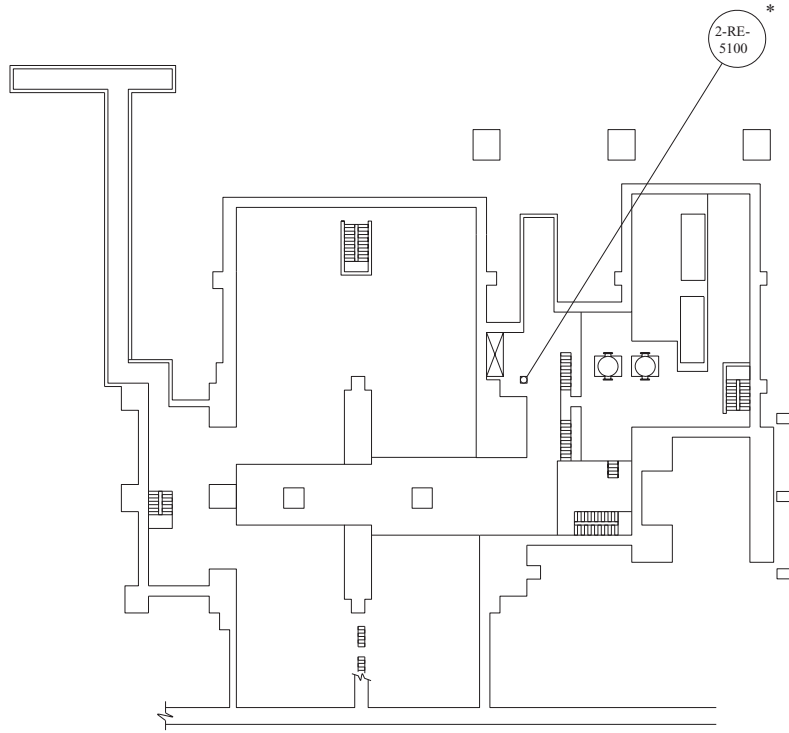
2-TE-5400	CNTMT TEMP EL 1001'-0"
2-TE-5401	CNTMT TEMP EL 1001'-0"
2-TE-5402	CNTMT TEMP EL 909'-0"
2-AE-5506D	H <sub>2</sub> MONITOR EL 910'-0"
2-RE-6290A	HIGH RANGE RADIATION MONITOR CNTMT EL 905'
2-RE-6290B	HIGH RANGE RADIATION MONITOR CNTMT EAST WALL
2-RE-6297	HIGH RANGE AREA MONITOR EMER AIR LOCK

PLANS AT EL 905'-9" AND 896'-4"

AMENDMENT 100  
December 18, 1992

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 CONTAINMENT BUILDING AND SAFEGUARD BUILDING ROOF PLANS AT EL 905'-9" AND 896'-4"</p>
<p>FIGURE 7.1-3 (SH 29 OF 36)</p>

2-RE-5100 TB SUMP 2-04 RADIATION  
DETECTOR



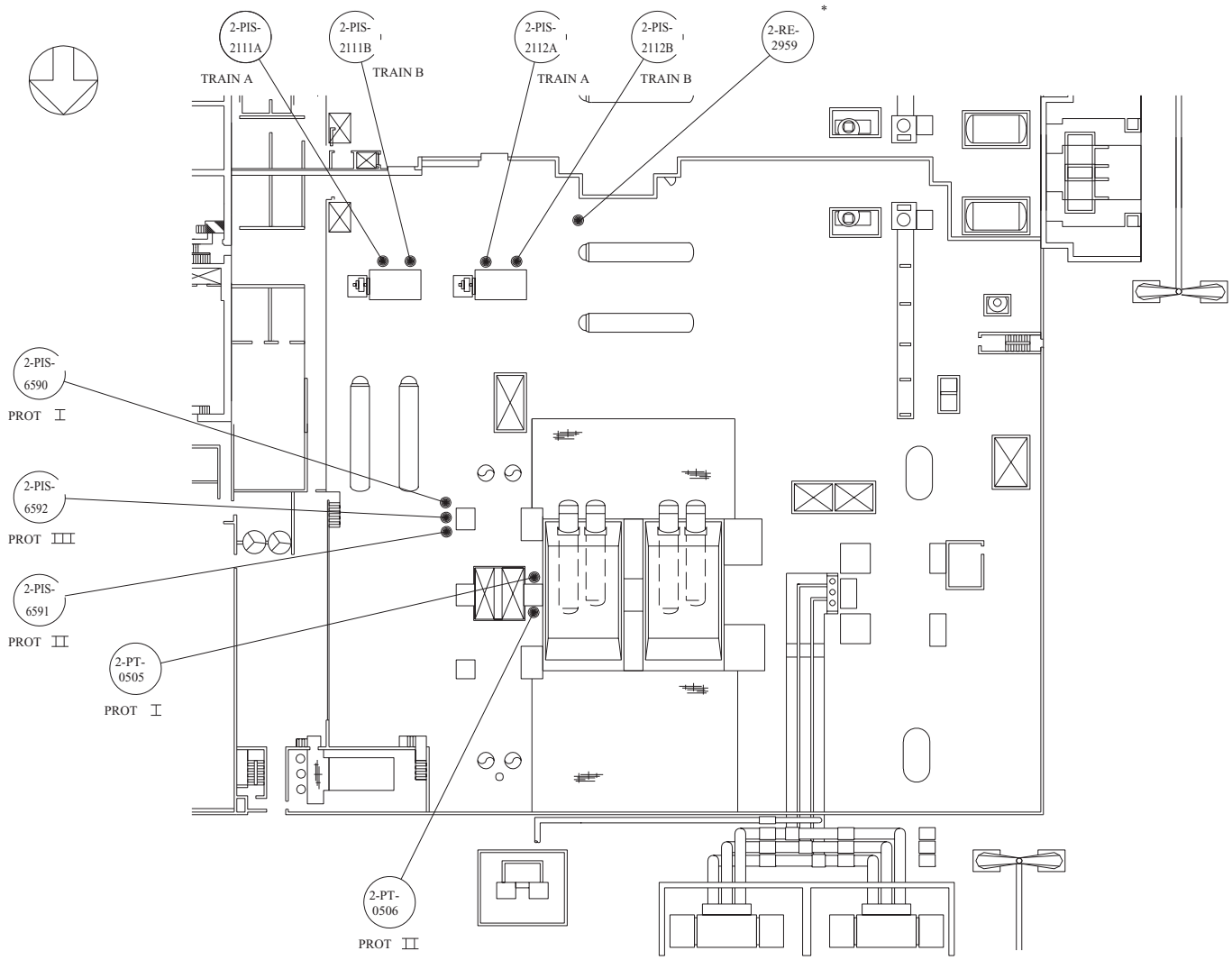
PLAN AT EL 755'-4" & 758'-3"

AMENDMENT 100  
December 18, 1992

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 TURBINE BUILDING PLANS AT EL 755'-4" AND 758'-3"</p>
<p>FIGURE 7.1-3 (SH 30 OF 36)</p>

FIGURE 7.1-3  
Sheet 31 of 36

This sheet has been deleted.



2-PIS-6590	TURBINE GEN HYDRO
2-PIS-6591	TURBINE GEN HYDRO
2-PIS-6592	TURBINE GEN HYDRO
2-PIS-2111A	FW PUMP 2-A OIL PRESS LO
2-PIS-2111B	FW PUMP 2-A OIL PRESS LO
2-PIS-2112A	FW PUMP 2-B OIL PRESS LO
2-PIS-2112B	FW PUMP 2-B OIL PRESS LO
2-PT-0505	TURBINE IMPULSE PRESS
2-PT-0506	TURBINE IMPULSE PRESS
2-RE-2959	CONDENSER OFF GAS MONITOR

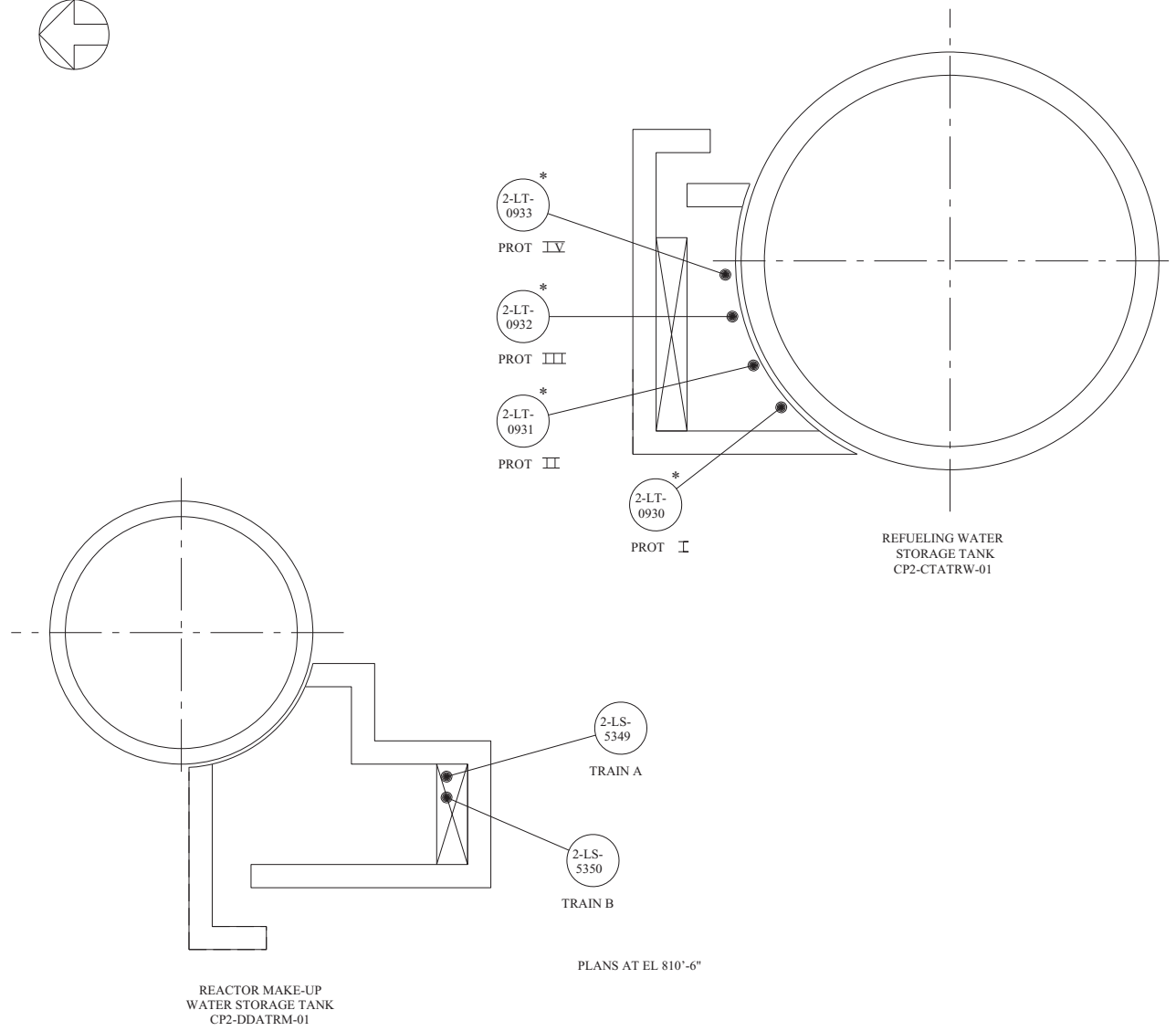
PLAN AT EL 803'-0" AND 810'-6"  
(MEZZANINE FLOOR PLAN)

AMENDMENT 96  
August 2, 1999

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 TURBINE BUILDING PLANS AT EL 803'-0" AND 810'-6"</p>
<p>FIGURE 7.1-3 (SH 32 OF 36)</p>



- 2-LT-0930 REFUELING WTR STORAGE TK
- 2-LT-0931 REFUELING WTR STORAGE TK
- 2-LT-0932 REFUELING WTR STORAGE TK
- 2-LT-0933 REFUELING WTR STORAGE TK
- 2-LS-5349 REACTOR MAKE-UP WTR STORAGE TK
- 2-LS-5350 REACTOR MAKE-UP WTR STORAGE TK



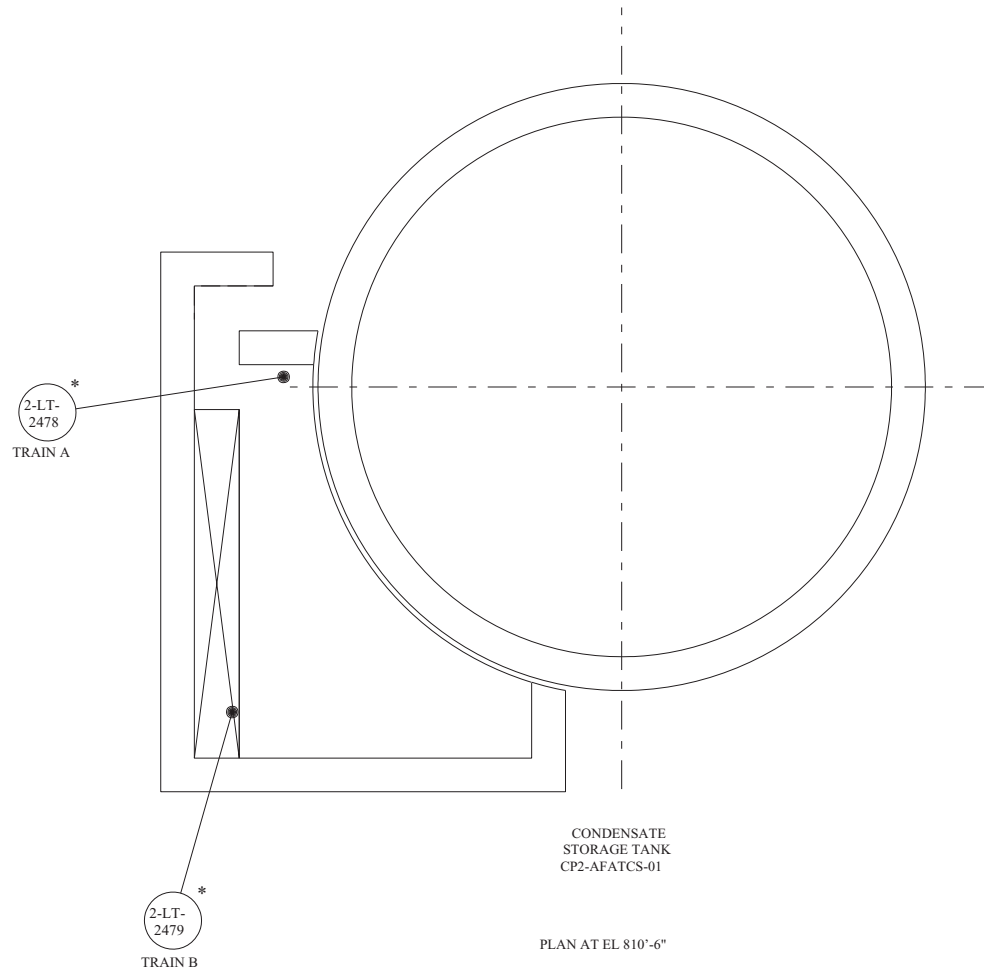
AMENDMENT 100  
December 18, 1992

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 YARD PLAN AT EL 810'-6"</p>
<p>FIGURE 7.1-3 (SH 33 OF 36)</p>



2-LT-2478  
2-LT-2479

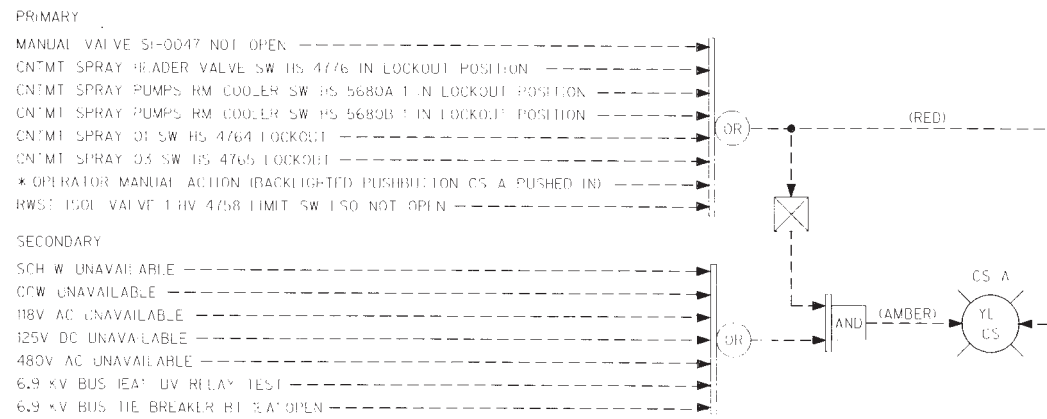
CONDENSATE STORAGE TANK  
CONDENSATE STORAGE TANK



AMENDMENT 100  
December 18, 1992

<p>COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2</p>
<p>LOCATION OF CLASS 1E INSTRUMENTS AND ACCIDENT MONITORING INSTRUMENTS UNIT 2 YARD PLAN AT EL 810'-6"</p>
<p>FIGURE 7.1-3 (SH 34 OF 36)</p>

CONTAINMENT SPRAY SYSTEM



TYPICAL FOR:

	TRAIN	MANUAL VALVE	HEADER VALVE SW HS	RM COOLER SW HS	PMP O1/O2 SW HS	PMP O1/O2 SW HS	RWSI ISO VALVE	TIE BKR	BACKLIGHT PR	
CS A	AA	1-SI-0047	4776	5680A-1	5680B-1	4764	4765	4758	BT-IIA1	CS A
CS B	BB	1-SI-0047	4777	5682A-1	5682B-1	4766	4767	4759	BT-IIA2	CS B

NOTES:

- OPERATOR MANUAL ACTION SET BY PUSHING IN THE APPLICABLE BACKLITTED PUSHBUTTON FOR ANY OTHER BYPASS NOT INCLUDED IN THE ABOVE MENTIONED AUTOMATIC TRIP. IN THIS CASE THE ALARM CAN ONLY BE RESET BY PUSHING IN AGAIN THE SAME BUTTON. OPERATOR MANUAL RESETTING SHALL NOT TURN OFF THE INDICATOR IF ANY OF THE AUTOMATIC INPUTS ARE ON.

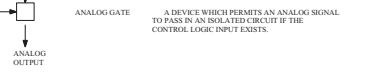
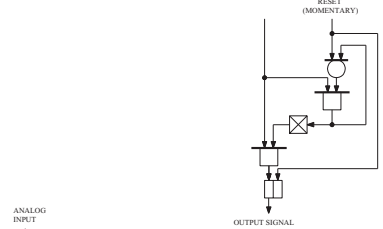
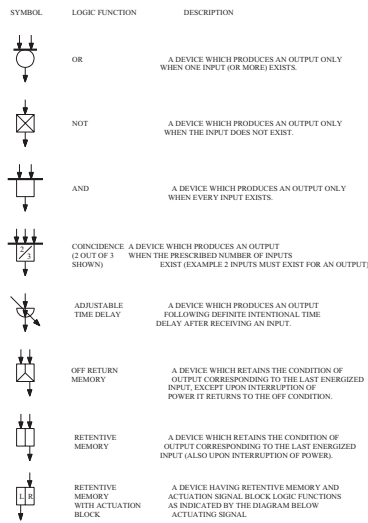
AMENDMENT 86  
AUGUST 31, 1992

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

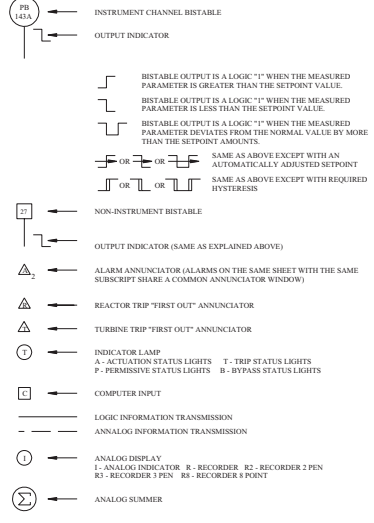
SAFETY SYSTEM  
INOPERABLE INDICATOR LOGIC  
FOR CONTAINMENT SPRAY SYSTEM (TYP)

FIGURE 7.1-4

LOGIC SYMBOLS



ADDITIONAL SYMBOLS



GENERAL NOTES: (FOR ALL SHEETS)

- IN ALL LOGIC CIRCUITS, THE INDICATED ACTUATION OF A SYSTEM OR DEVICE OCCURS WHEN A LOGIC "1" SIGNAL IS PRESENT, EXCEPT WHERE INDICATED OTHERWISE. ALL BISTABLES ARE "DE-ENERGIZE TO ACTUATE" SUCH THAT A LOGIC "1" SIGNAL IS DEFINED TO BE PRESENT WHEN THE BISTABLE OUTPUT VOLTAGE IS OFF.
  - EXCEPT WHERE INDICATED OTHERWISE, THE FOLLOWING IS TRUE: ALL LOGIC CIRCUITS ARE REDUNDANT THAT IS EVERY LOGIC CIRCUIT SHOWN HAS A DUPLICATE LOCATED IN A SEPARATE CABINET. ALL INSTRUMENT CHANNELS, BISTABLES, ANNUNCIATORS, COMPUTER INPUTS, AND INDICATOR LAMPS ARE NOT REDUNDANT. MANUAL CONTROLS DO NOT HAVE REDUNDANT ACTUATORS, BUT DO HAVE REDUNDANT CONTACTS WHERE LOGIC IS REDUNDANT. ALL INDICATOR LAMPS, ANNUNCIATORS, AND COMPUTER INPUTS ARE CONNECTED TO BOTH TRAINS (WHERE LOGIC IS REDUNDANT) SO THAT A SIGNAL IN EITHER TRAIN WILL ACTUATE.
  - WHenever a process signal is used for control and is derived from a protection channel, isolation must be provided.
  - THIS SET OF DRAWINGS ILLUSTRATES THE FUNCTIONAL REQUIREMENTS OF AMSAC AND THE REACTOR CONTROL AND PROTECTION SYSTEM, INCLUDING ENGINEERED SAFEGUARDS. THESE DRAWINGS DO NOT REPRESENT ACTUAL HARDWARE IMPLEMENTATION. FOR HARDWARE IMPLEMENTATION, REFER TO THE FOLLOWING LIST:
- | FUNCTIONAL DIAGRAM                                     | BLOCK OR WIRING DIAGRAM  |
|--|--|
| REACTOR PROTECTION SYSTEM (SHEETS 1 TO 8, 15, 16 & 18) | DRAWING NUMBERS: 5655D49, 5655D50, 5655D51, 7247D64, 8758D39, 1084E16, 1095E43, 271C120, 3D20430 |
| REACTOR CONTROL SYSTEM (SHEETS 9 TO 16)                | DRAWING NUMBERS: 5655D52, 8758D39, 271C120   |
- FOR A TWO UNIT PLANT: THIS SET OF DRAWINGS IS IDENTICAL FOR UNITS 1 AND 2 EXCEPT FOR THE TAG NUMBERS.  
FOR UNIT 1 TAG NUMBERS ADD A "1". EXAMPLE: 1PB-45E.  
FOR UNIT 2 TAG NUMBERS ADD A "2". EXAMPLE: 2PB-45E.
  - FOR THIS SET OF DRAWINGS, ALL SWITCHES, PUSH BUTTONS, ANNUNCIATORS, STATUS LIGHTS, AND INDICATORS (EXCEPT FOR THE NON-PROCESS SYSTEMS INDICATORS, CONTROLLERS, AND MANUAL AUTO STATIONS) WHICH ARE MOUNTED ON THE MAIN CONTROL BOARD ARE SUPPLIED BY OTHERS. IN ADDITION TO THE ABOVE, SCOPE BY OTHERS IS ALSO INDICATED DIRECTLY ON SHEETS WITHIN THIS SET.

DEVICE FUNCTION LETTERS AND NUMBERS

- |                |                         |
|----------------|-------------------------|
| FB             | FLOW CHANNEL            |
| LB             | LEVEL CHANNEL           |
| NC             | NUCLEAR CHANNEL         |
| PB             | PRESSURE CHANNEL        |
| RC             | RADIATION CHANNEL       |
| SB             | SPEED CHANNEL           |
| TB             | TEMPERATURE CHANNEL     |
| ZB             | POSITION CHANNEL        |
| 20             | ELECTRIC OPERATED VALVE |
| 27             | UNDERVOLTAGE RELAY      |
| 33             | POSITION SWITCH         |
|                | SUFFIX LETTER:          |
| ac, ao, bc, bo | LIMIT SWITCH            |
| bc, to         | TORQUE SWITCH           |
- POSITION SWITCH DEVELOPMENTS
- 
- |    |                      |
|----|----------------------|
| 52 | AC CIRCUIT BREAKER   |
|    | SUFFIX LETTER:       |
| a  | AUXILIARY CONTACT    |
| b  | AUXILIARY CONTACT    |
| H  | IN CELL SWITCH       |
| 63 | PRESSURE SWITCH      |
| 71 | LEVEL SWITCH         |
| 80 | FLOW SWITCH          |
| 81 | UNDERFREQUENCY RELAY |
- OPEN WHEN MAIN CONTACTS ARE OPEN  
CLOSED WHEN MAIN CONTACTS ARE OPEN  
CLOSED WHEN BREAKER IS IN THE CONNECTED POSITION

INDEX	
TITLE	SH. NO.
INDEX AND SYMBOLS	1
REACTOR TRIP SYMBOLS	2
NUCLEAR INSTR. AND MANUAL TRIP SIGNALS	3
NUCLEAR INSTR. PERMISSIVES AND BLOCKS	4
PRIMARY COOLANT SYSTEM TRIP SIGNALS	5
PRESSURIZER TRIP SIGNALS	6
STEAM GENERATOR TRIP SIGNALS	7
SAFEGUARDS ACTUATION SIGNALS	8
ROD CONTROLS AND ROD BLOCKS	9
STEAM BUMP CONTROL	10
PRESSURIZER PRESSURE AND LEVEL CONTROL	11
PRESSURIZER HEATER CONTROL	12
FEEDWATER CONTROL AND ISOLATION	13
FEEDWATER CONTROL AND ISOLATION	14
AUXILIARY FEEDWATER PUMPS STARTUP	15
TURBINE TRIPS, RUNBACKS AND OTHER SIGNALS	16
SOURCE RANGE FLUX-DOUBLING ALGORITHM	17
AMSAC SIGNALS	18

FIGURE GENERATED FOR FSAR ONLY  
BASED ON DRAWING  
7247D05 SH 1

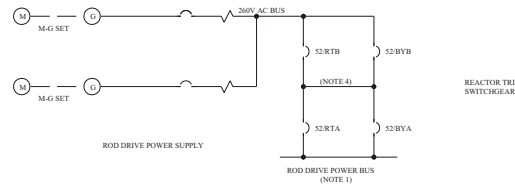
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

FUNCTIONAL DIAGRAMS

FIGURE 72-1 SH 1

AMENDMENT 76  
May 1, 1989

ROD DRIVE SUPPLY ONE LINE DIAGRAM



- NOTES:
- TRIPPING THE REACTOR TRIP BREAKERS S2RTA AND S2RTB REDUNDANTLY DE-ENERGIZES THE ROD DRIVES. ALL FULL LENGTH CONTROL RODS AND SHUT-DOWNS RODS ARE THEREBY RELEASED FOR GRAVITY INSERTION INTO THE REACTOR CORE.
  - NORMAL REACTOR OPERATION IS TO BE WITH REACTOR TRIP BREAKERS S2RTA AND S2RTB IN SERVICE AND BY-PASS BREAKERS S2BYA AND S2BYB WITHDRAWN. DURING TEST, ONE BY-PASS BREAKER IS TO BE PUT IN SERVICE AND THEN THE RESPECTIVE REACTOR TRIP BREAKER IS OPERATED USING A SIMULATED REACTOR TRIP SIGNAL IN THE TRAIN UNDER TEST. THE REACTOR WILL NOT BE TRIPPED BY THE SIMULATED SIGNAL SINCE THE BY-PASS BREAKER IS CONTROLLED FROM THE OTHER TRAIN. ONLY ONE REACTOR TRIP BREAKER IS TO BE TESTED AT A TIME.
  - ALL CIRCUITS ON THIS SHEET ARE NOT REDUNDANT BECAUSE BOTH TRAINS ARE SHOWN.
  - OPEN/CLOSED INDICATION FOR EACH TRIP BREAKER AND EACH BY-PASS BREAKER IN CONTROL ROOM.

TRAIN A REACTOR SHUNT TRIP SIGNALS

- MANUAL REACTOR TRIP SIGNAL (SHEET 3)
- MANUAL SAFETY INJECTION DSIGNAL (SHEET 8)

LOGIC TRAIN A REACTOR TRIP SIGNALS

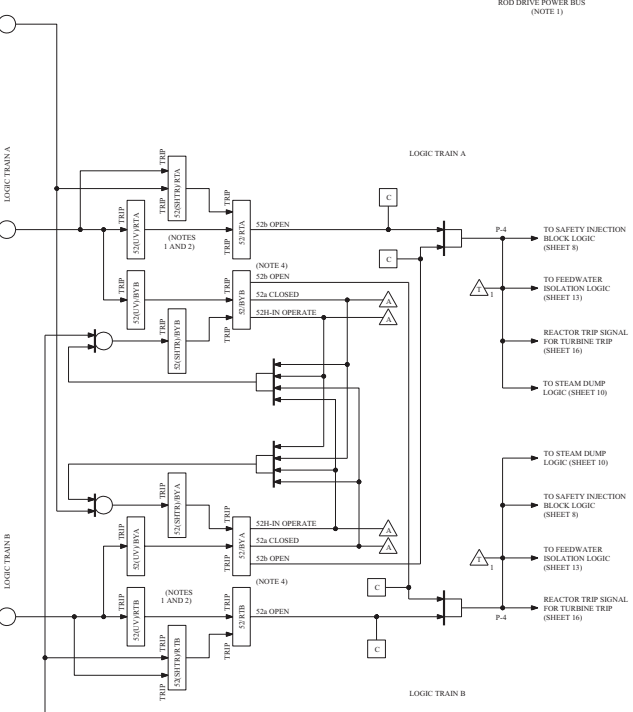
- MANUAL TRIP SIGNAL (SHEET 3)
- NEUTRON FLUX TRIP SIGNALS (SHEET 3)
  - SOURCE RANGE, HIGH FLUX (INTERLOCKED BY P-6 & P-10)
  - INTERMEDIATE RANGE, HIGH FLUX (INTERLOCKED BY P-10)
  - POWER RANGE
    - HIGH FLUX, LOW SETPOINT (INTERLOCKED BY P-10)
    - HIGH FLUX, HIGH SETPOINT
    - HIGH FLUX RATE
- PRIMARY COOLANT SYSTEM TRIP SIGNALS (SHEET 5)
  - OVERTEMPERATURE N16
  - OVERPOWER N16
  - LOW PRIMARY COOLANT FLOW
    - LOW FLOW IN ANY 1 OF 4 LOOPS (INTERLOCKED BY P-5)
    - LOW FLOW IN ANY 2 OF 4 LOOPS (INTERLOCKED BY P-7)
  - UNDERVOLTAGE (INTERLOCKED BY P-7)
  - UNDERFREQUENCY (INTERLOCKED BY P-7)
- PRESSURIZER TRIP SIGNALS (SHEET 6)
  - HIGH PRESSURE
  - LOW PRESSURE (INTERLOCKED BY P-7)
- STEAM GENERATOR TRIP SIGNALS (SHEET 7)
  - HIGH LEVEL (INTERLOCKED BY P-7)
  - LOW-LOW STEAM GENERATOR WATER LEVEL
- SAFETY INJECTION SIGNAL (SHEET 8)
  - MANUAL SIGNAL
- TURBINE TRIP SIGNAL (SHEET 16)
  - LOW TRIP FLUID PRESSURE OR ALL STOP VALVES CLOSED (INTERLOCKED BY P-9)

LOGIC TRAIN B REACTOR TRIP SIGNALS

- MANUAL TRIP SIGNAL (SHEET 3)
- NEUTRON FLUX TRIP SIGNALS (SHEET 3)
  - SOURCE RANGE, HIGH FLUX (INTERLOCKED BY P-6 & P-10)
  - INTERMEDIATE RANGE, HIGH FLUX (INTERLOCKED BY P-10)
  - POWER RANGE
    - HIGH FLUX, LOW SETPOINT (INTERLOCKED BY P-10)
    - HIGH FLUX, HIGH SETPOINT
    - HIGH FLUX RATE
- PRIMARY COOLANT SYSTEM TRIP SIGNALS (SHEET 5)
  - OVERTEMPERATURE N16
  - OVERPOWER N16
  - LOW PRIMARY COOLANT FLOW
    - LOW FLOW IN ANY 1 OF 4 LOOPS (INTERLOCKED BY P-5)
    - LOW FLOW IN ANY 2 OF 4 LOOPS (INTERLOCKED BY P-7)
  - UNDERVOLTAGE (INTERLOCKED BY P-7)
  - UNDERFREQUENCY (INTERLOCKED BY P-7)
- PRESSURIZER TRIP SIGNALS (SHEET 6)
  - HIGH PRESSURE
  - LOW PRESSURE (INTERLOCKED BY P-7)
- STEAM GENERATOR TRIP SIGNALS (SHEET 7)
  - HIGH LEVEL (INTERLOCKED BY P-7)
  - LOW-LOW STEAM GENERATOR WATER LEVEL
- SAFETY INJECTION SIGNAL (SHEET 8)
  - MANUAL SIGNAL
- TURBINE TRIP SIGNAL (SHEET 16)
  - LOW TRIP FLUID PRESSURE OR ALL STOP VALVES CLOSED (INTERLOCKED BY P-9)

TRAIN B REACTOR SHUNT TRIP SIGNALS

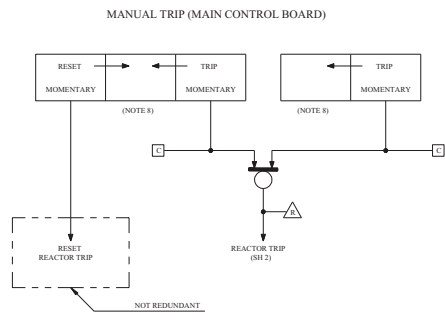
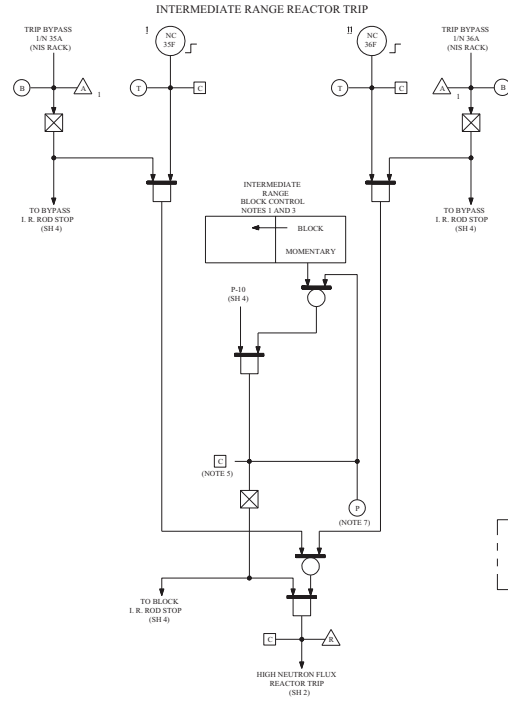
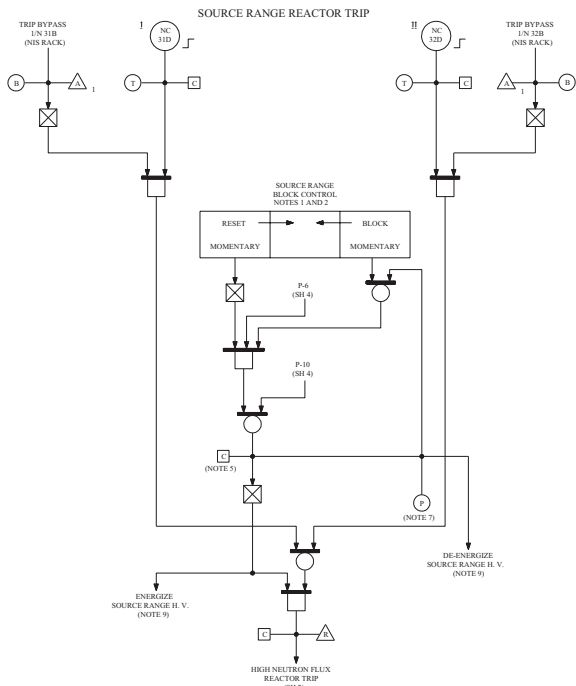
- MANUAL REACTOR TRIP SIGNAL (SHEET 3)
- MANUAL SAFETY INJECTION SIGNAL (SHEET 8)



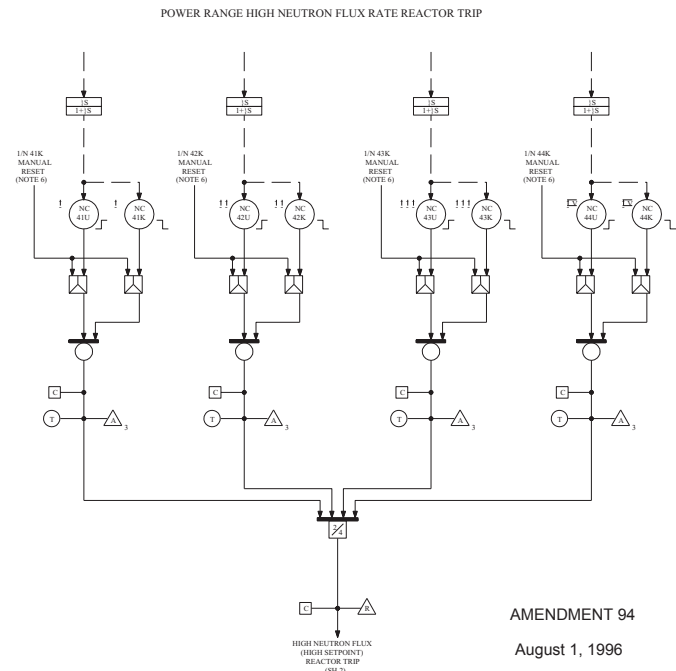
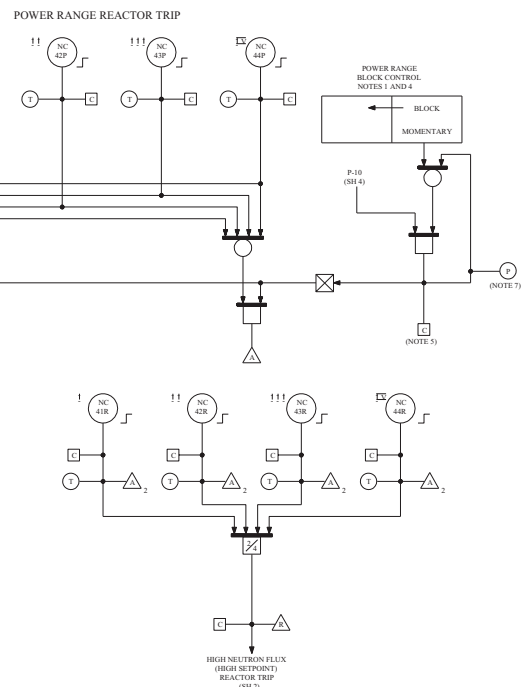
AMENDMENT 100

September 8, 1989

FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING 7247D05 SH 2
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUNCTIONAL DIAGRAM
FIGURE 72-1 SH 2



- NOTES:
1. THE REDUNDANT MANUAL BLOCK CONTROLS CONSIST OF TWO CONTROLS ON THE CONTROL BOARD FOR EACH RANGE, ONE FOR EACH TRAIN, SUPPLIED BY OTHERS.
  2. 1N 31A IS IN LOGIC TRAIN A.  
1N 31B IS IN LOGIC TRAIN B.
  3. 1N 35A IS IN LOGIC TRAIN A.  
1N 35B IS IN LOGIC TRAIN B.
  4. 1N 47A IS IN LOGIC TRAIN A.  
1N 47B IS IN LOGIC TRAIN B.
  5. TWO COMPUTER INPUTS ARE CONNECTED TO THIS CIRCUIT, INDIVIDUAL FOR EACH TRAIN.
  6. MANUAL RESET CONTROLS CONSIST OF FOUR MOMENTARY CONTROLS IN THE CONTROL ROOM, ONE CONTROL FOR EACH INSTRUMENT CHANNEL.
  7. TWO PERMISSIVE STATUS LIGHTS ARE CONNECTED TO THIS CIRCUIT, INDIVIDUAL FOR EACH TRAIN.
  8. SUPPLIED BY OTHERS.
  9. EACH SOURCE RANGE FLUX DETECTOR IS ENERGIZED AND DE-ENERGIZED BY LOGIC OUTPUT FROM A SINGLE TRAIN. THE TWO SOURCE RANGE FLUX DETECTORS (N-31 AND N-32) ARE ON SEPARATE TRAINS.

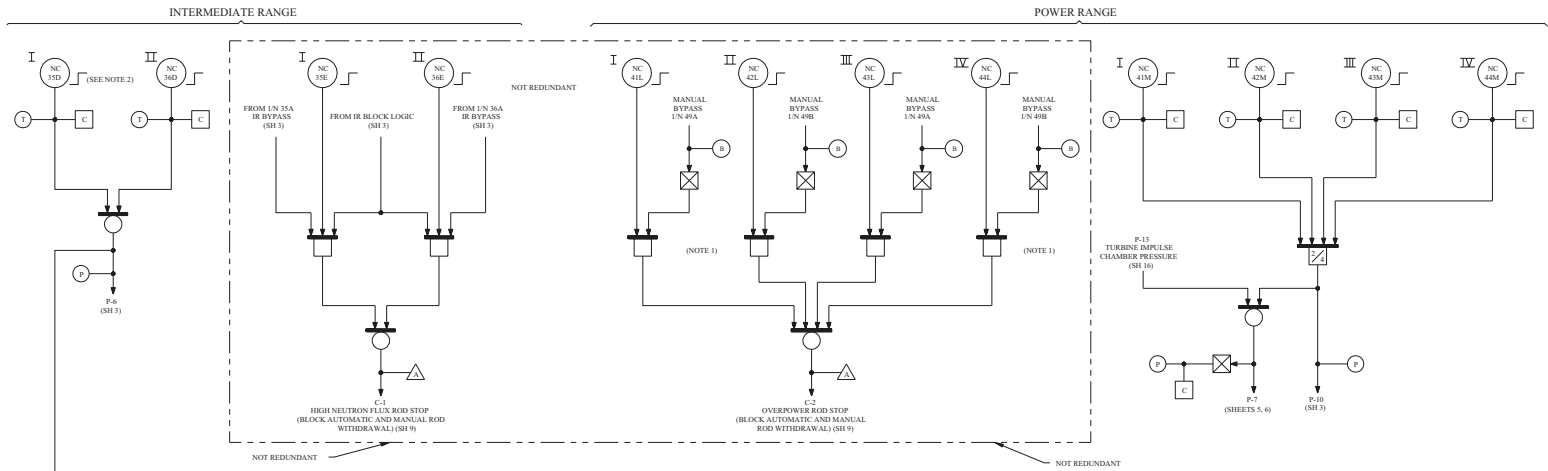


AMENDMENT 94  
August 1, 1996

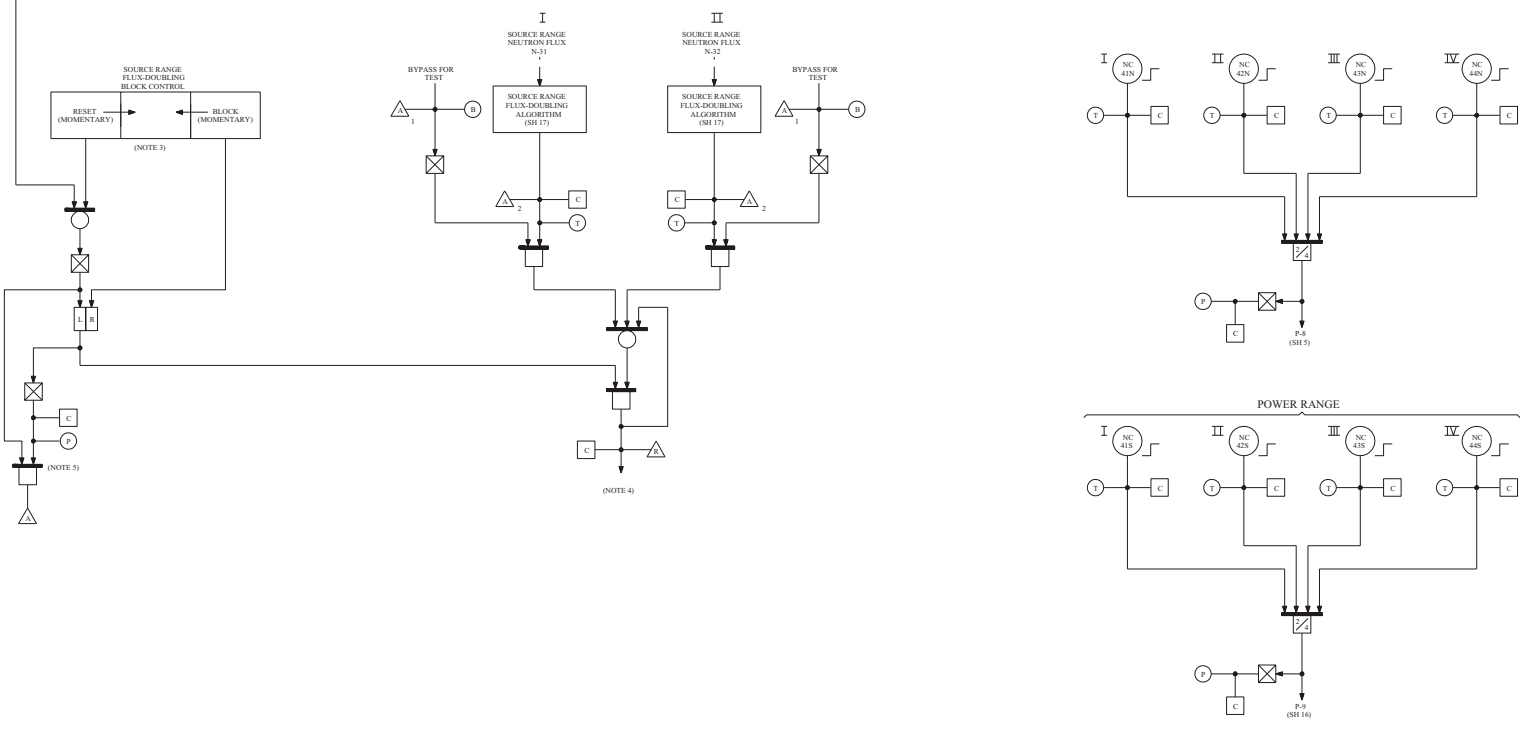
FIGURE GENERATED FOR FSAR ONLY  
BASED ON DRAWING  
© 7247D05 SH 3  
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

FUNCTIONAL DIAGRAM

FIGURE 7.2-1 SH 3

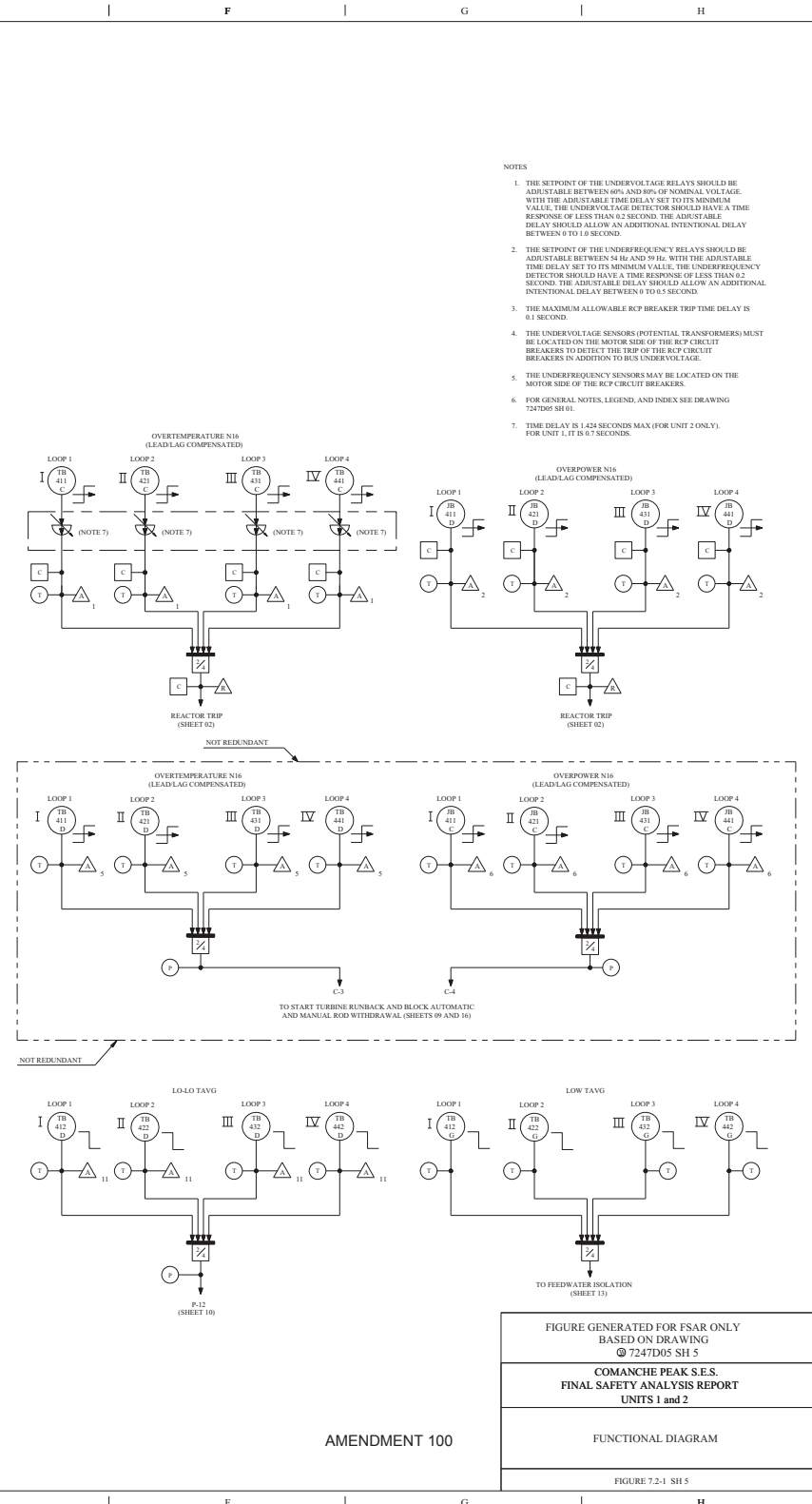
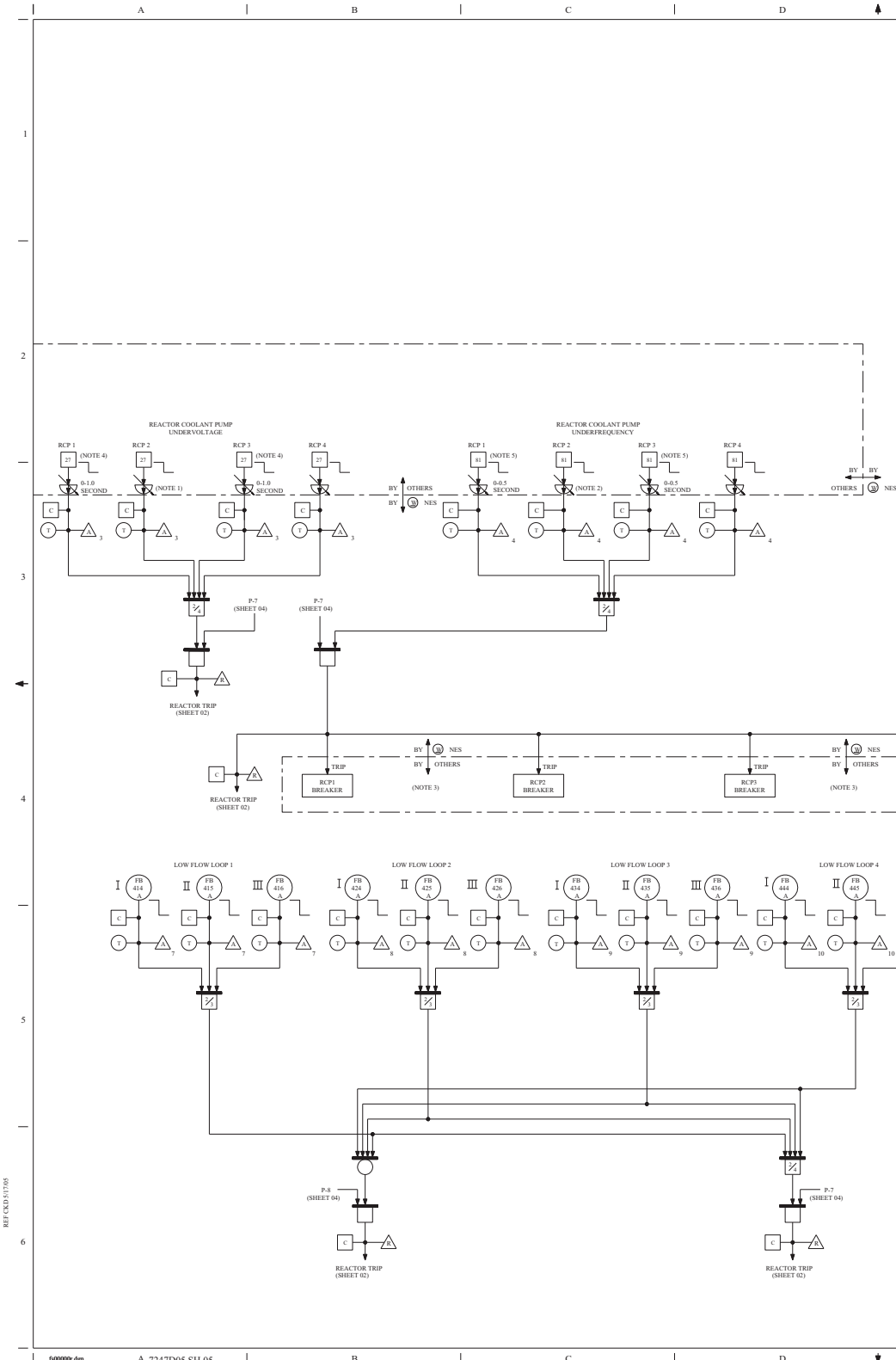


- NOTES:
1. THE BYPASS SIGNALS ARE MADE UP BY MEANS OF TWO THREE-POSITION SWITCHES ON A NIS RACK. SWITCH I/N 40A BYPASSES EITHER NC-41L OR NC-42L. SWITCH I/N 40B BYPASSES EITHER NC-43L OR NC-44L.
  2. THE TWO P-6 BISTABLE NUMBERS NC-35D AND NC-36D ARE "SENSORIZED TO ACTUATE" SUCH THAT A LOGIC 1 SIGNAL IS DEFINED TO BE PRESENT WHEN THE BISTABLE OUTPUT VOLTAGE IS ON.
  3. THE REDUNDANT MANUAL BLOCK CONTROL CONSISTS OF TWO CONTROLS ON THE CONTROL BOARD, ONE FOR EACH TRAIN. SUPPLIED BY OTHERS.
  4. FLUX DOUBLING LOGIC IS DISCONNECTED FROM VALVES LCV-12BC.
  5. TWO PERMISSIVE STATUS LIGHTS ARE CONNECTED TO THIS CIRCUIT, INDIVIDUAL FOR EACH TRAIN.



AMENDMENT 100

FIGURE GENERATED FOR FSAR ONLY  
 BASED ON DRAWING  
 7247D05 SH 4  
 COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 AND 2  
 FUNCTIONAL DIAGRAMS  
 FIGURE 7.2-1 SH 4

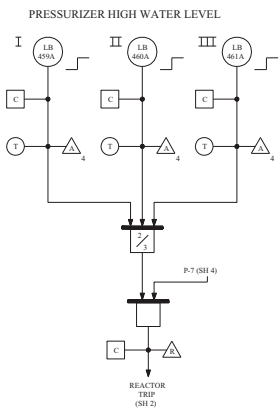
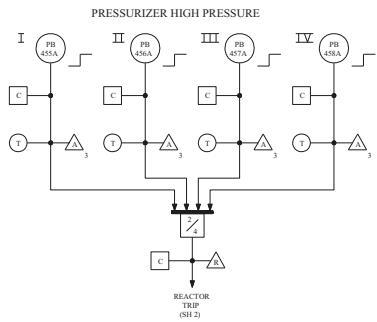
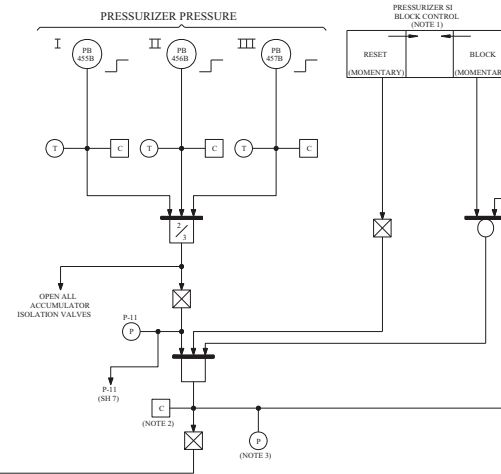
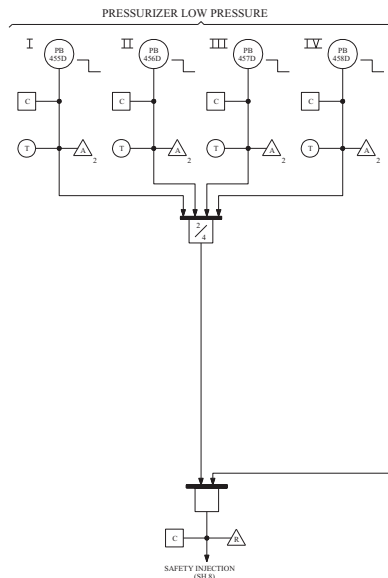
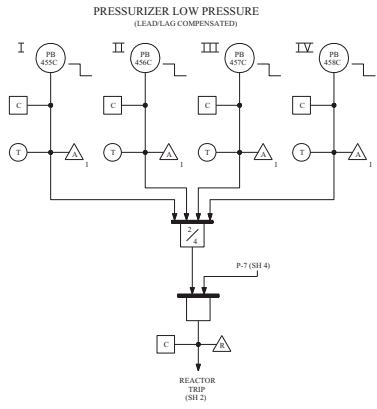


- NOTES
1. THE SETPOINT OF THE UNDERVOLTAGE RELAYS SHOULD BE ADJUSTABLE BETWEEN 60% AND 80% OF NOMINAL VOLTAGE. WITH THE ADJUSTABLE TIME DELAY SET TO ITS MINIMUM VALUE, THE UNDERVOLTAGE DETECTOR SHOULD HAVE A TIME RESPONSE OF LESS THAN 0.2 SECOND. THE ADJUSTABLE DELAY SHOULD ALLOW AN ADDITIONAL INTENTIONAL DELAY BETWEEN 0 TO 1.0 SECOND.
  2. THE SETPOINT OF THE UNDERFREQUENCY RELAYS SHOULD BE ADJUSTABLE BETWEEN 54 Hz AND 59 Hz. WITH THE ADJUSTABLE TIME DELAY SET TO ITS MINIMUM VALUE, THE UNDERFREQUENCY DETECTOR SHOULD HAVE A TIME RESPONSE OF LESS THAN 0.2 SECOND. THE ADJUSTABLE DELAY SHOULD ALLOW AN ADDITIONAL INTENTIONAL DELAY BETWEEN 0 TO 0.5 SECOND.
  3. THE MAXIMUM ALLOWABLE RCP BREAKER TRIP TIME DELAY IS 0.1 SECOND.
  4. THE UNDERVOLTAGE SENSORS (POTENTIAL TRANSFORMERS) MUST BE LOCATED ON THE MOTOR SIDE OF THE RCP CIRCUIT BREAKERS TO DETECT THE TRIP OF THE RCP CIRCUIT BREAKERS IN ADDITION TO BUS UNDERVOLTAGE.
  5. THE UNDERFREQUENCY SENSORS MAY BE LOCATED ON THE MOTOR SIDE OF THE RCP CIRCUIT BREAKERS.
  6. FOR GENERAL NOTES, LEGEND, AND INDEX SEE DRAWING 7247D05 SH 01.
  7. TIME DELAY IS 1.424 SECONDS MAX (FOR UNIT 2 ONLY). FOR UNIT 1, IT IS 0.7 SECONDS.

FIGURE GENERATED FOR FSAR ONLY  
 BASED ON DRAWING  
 7247D05 SH 5  
 COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 FUNCTIONAL DIAGRAM  
 FIGURE 7.2-1 SH 5

AMENDMENT 100

REFCAD:UTWS

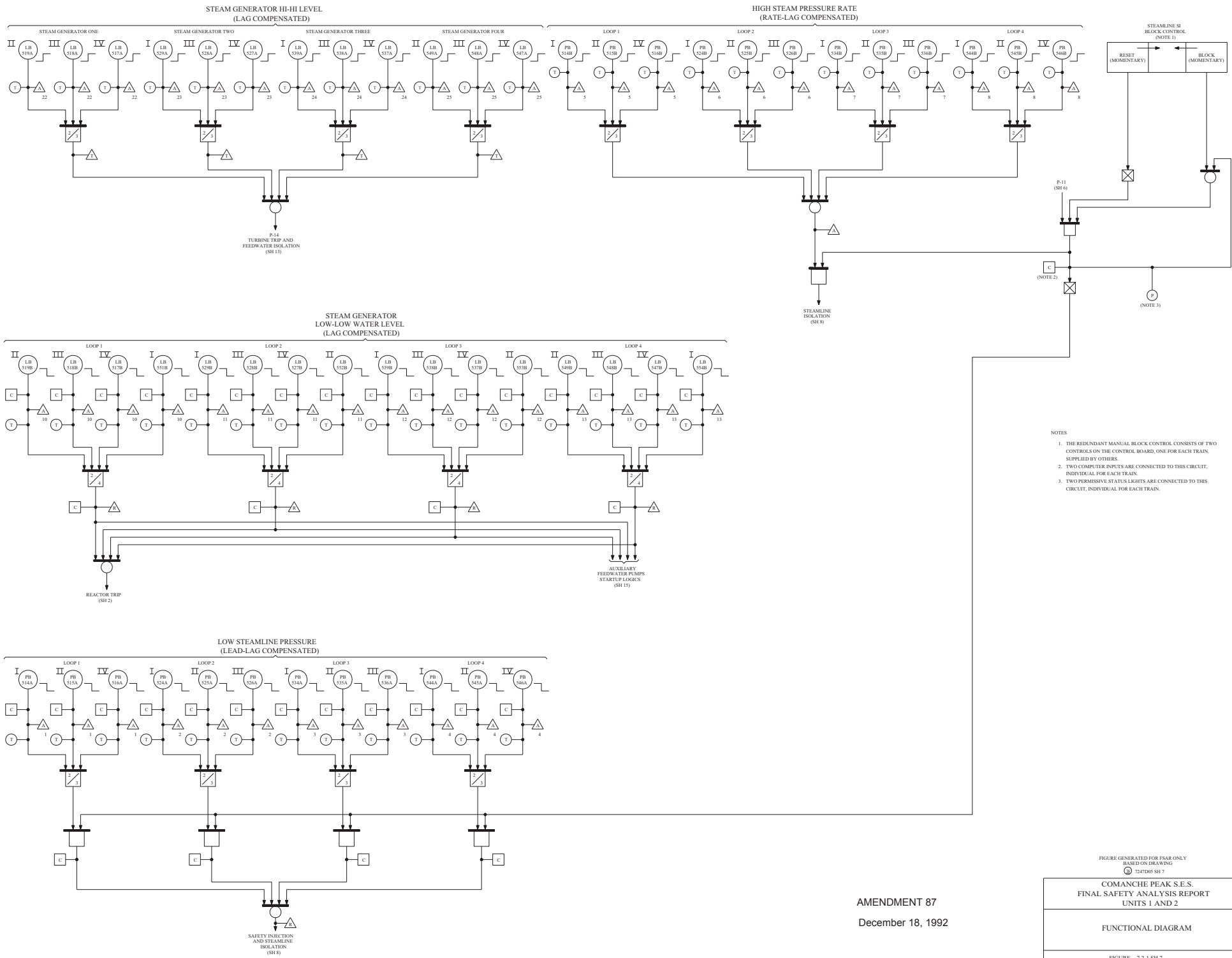


- NOTES
1. THE REDUNDANT MANUAL BLOCK CONTROL CONSISTS OF TWO CONTROLS ON THE CONTROL BOARD, ONE FOR EACH TRAIN, INDIVIDUAL FOR EACH TRAIN.
  2. TWO COMPUTER INPUTS ARE CONNECTED TO THIS CIRCUIT, INDIVIDUAL FOR EACH TRAIN.
  3. TWO PERMISSIVE STATUS LIGHTS ARE CONNECTED TO THIS CIRCUIT, INDIVIDUAL FOR EACH TRAIN.

AMENDMENT 76  
May 1, 1989

FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING 7247D05 SH 6
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUNCTIONAL DIAGRAM
FIGURE 7.2-1 SH 6





- NOTES
1. THE REDUNDANT MANUAL BLOCK CONTROL CONSISTS OF TWO CONTROLS ON THE CONTROL BOARD, ONE FOR EACH TRAIN, SUPPLIED BY OTHERS.
  2. TWO COMPUTER INPUTS ARE CONNECTED TO THIS CIRCUIT, INDIVIDUAL FOR EACH TRAIN.
  3. TWO PERMISSIVE STATUS LIGHTS ARE CONNECTED TO THIS CIRCUIT, INDIVIDUAL FOR EACH TRAIN.

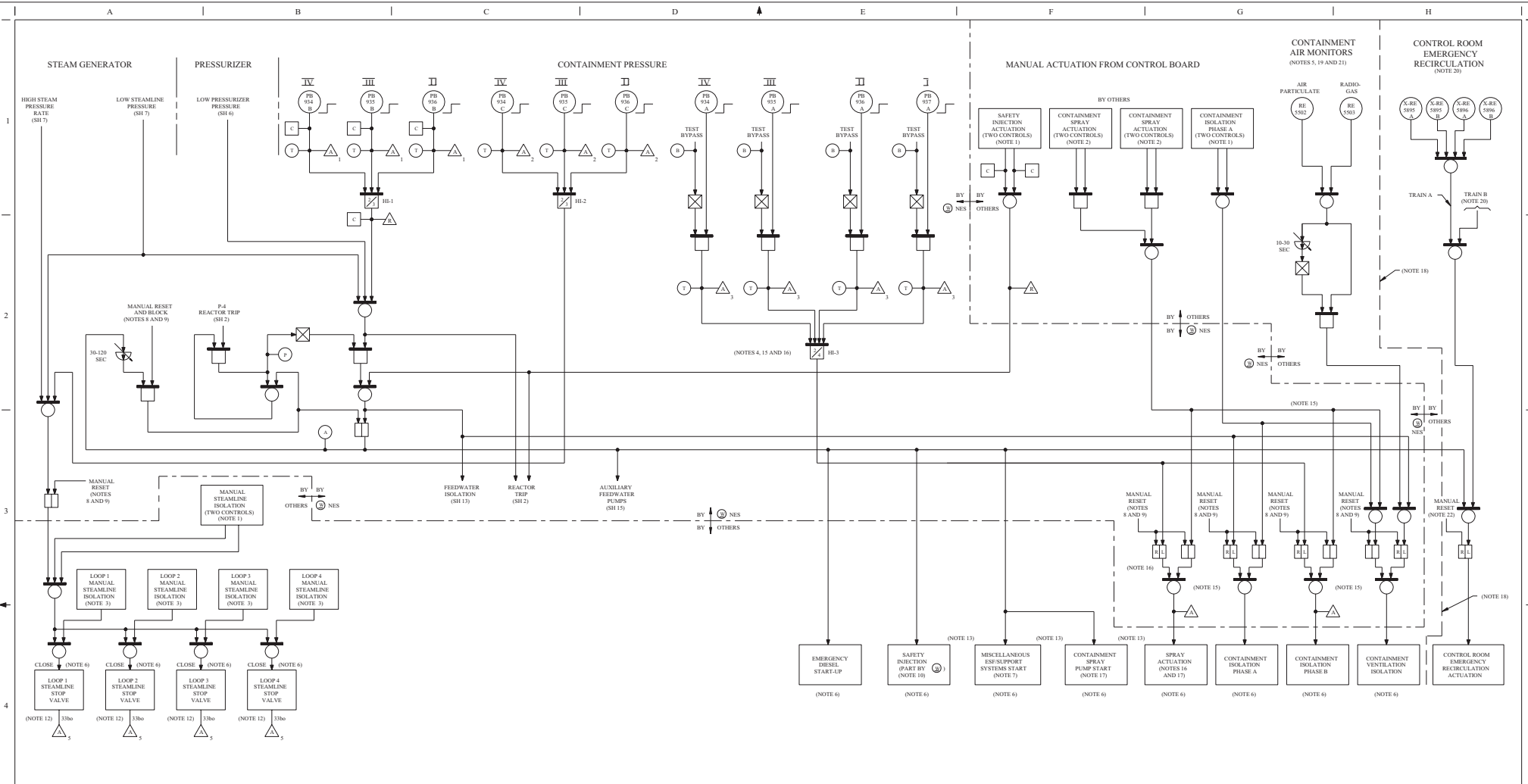
FIGURE GENERATED FOR PSAR ONLY  
 BASED ON DRAWING  
 7247D05 SH 7

COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 AND 2

FUNCTIONAL DIAGRAM

FIGURE 7.2-1 SH 7

AMENDMENT 87  
 December 18, 1992

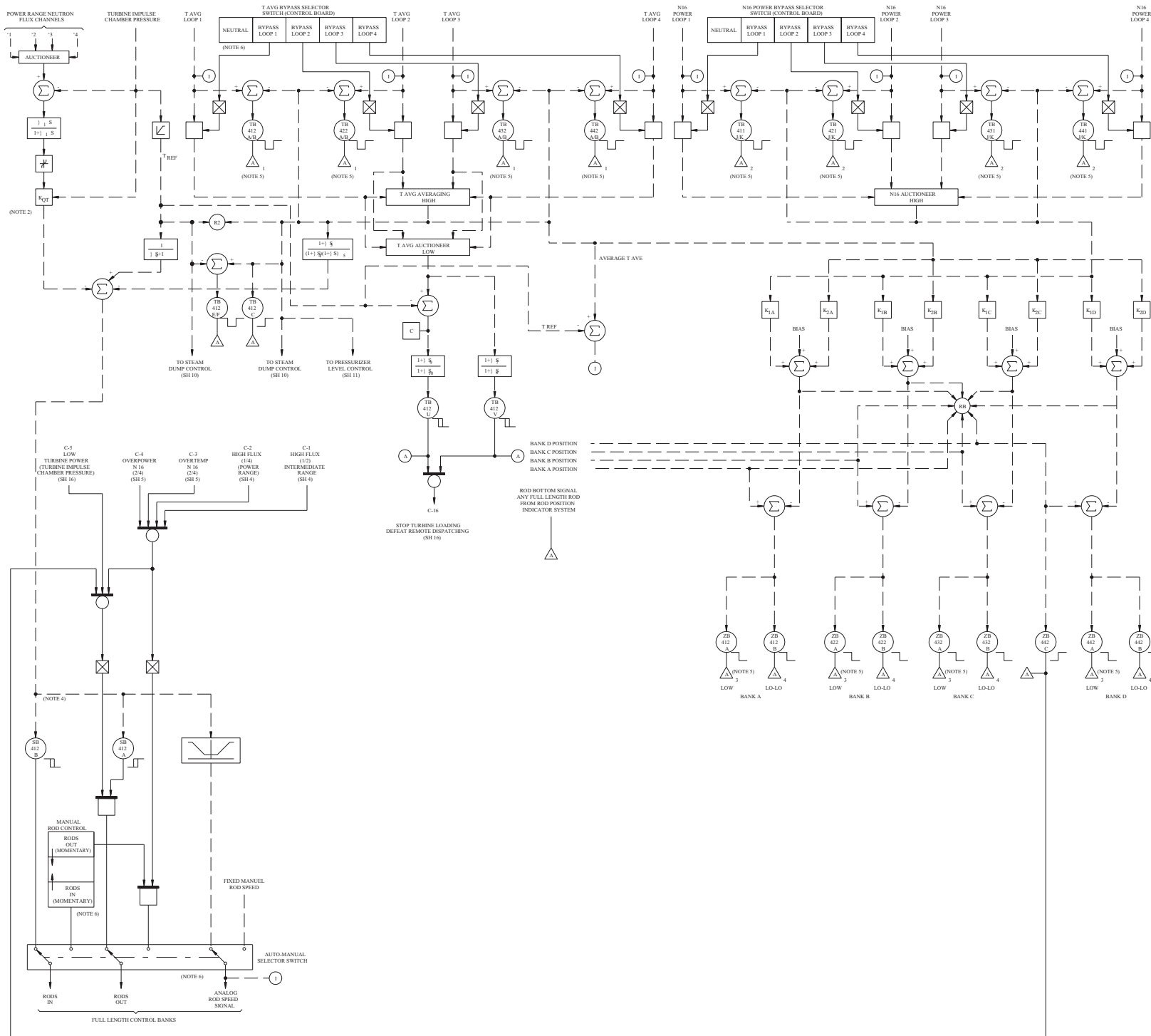


NOTES

1. TWO MOMENTARY CONTROLS ON THE CONTROL BOARD, OPERATING EITHER CONTROL, WILL ACTUATE.
2. THE MANUAL SPRAY ACTUATION CONSIST OF FOUR MOMENTARY CONTROLS. ACTUATION WILL OCCUR ONLY IF TWO ASSOCIATED CONTROLS ARE OPERATED SIMULTANEOUSLY.
3. ONE MOMENTARY CONTROL PER LOOP ON THE CONTROL BOARD.
4. CONTAINMENT PRESSURE RESTABLES FOR SPRAY ACTUATION ARE ENERGIZED TO ACTUATE (OTHER BISTABLES ARE DE-ENERGIZED TO ACTUATE).
5. CONTAINMENT AIR MONITORS CONTROL CIRCUITRY IS NOT PART OF ESF SYSTEM AND IS TRAIN C.
6. COMPONENTS ARE ALL INDIVIDUALLY SEALED IN (LATCHED), SO THAT LOSS OF THE ACTUATION SIGNAL WILL NOT CAUSE THESE COMPONENTS TO RETURN TO THE CONDITION PRIOR TO THE ADVENT OF THE ACTUATION SIGNAL.
7. MISCELLANEOUS ESF SUPPORT SYSTEMS INCLUDE STATION SERVICE WATER, COMPONENT COOLING WATER AND ESSENTIAL VENTILATION (SAFETY CHILLED WATER, ELECTRICAL AREA FANS, PRIMARY PLANT ESF EXHAUST FANS AND UPS VENTILATION).
8. THE REDUNDANT MANUAL RESET CONSIST OF TWO MOMENTARY CONTROLS ON THE CONTROL BOARD, ONE FOR EACH TRAIN, SUPPLIED BY OTHERS.
9. SAFETY INJECTION SEQUENCE REQUIREMENTS (IF SEQUENCING IS NECESSARY) ARE SPECIFIED BY OTHERS.
10. LIGHTS SHOULD BE PROVIDED IN THE CONTROL ROOM FOR EACH STEAMLINE STOP VALVE TO INDICATE WHEN THE VALVE IS FULLY CLOSED OR FULLY OPEN.
11. THE ACTUATION MAY BE DELAYED AND SEQUENCED IF THE EMERGENCY DIESEL POWER CAPABILITY IS LESS THAN THE TOTAL LOAD WITH ALL SYSTEMS STARTING. THE TIME DELAY, IF USED MAY NOT EXCEED THE MAXIMUM STARTING TIME REQUIREMENTS FOR EACH SYSTEM.
12. TWO CONTROLS ON THE CONTROL BOARD, OPERATING EITHER CONTROL, WILL ACTUATE.
13. SOME ENGINEERED SAFEGUARDS FUNCTIONS ARE NOT WITHIN THE FUNCTIONAL DESIGN SCOPE OF THIS AIR ENERGY SYSTEMS BUT ONLY SHOWS ON THIS SHEET AS THE FUNCTIONS ARE BUILT IN THE SUPPLY EQUIPMENT.
14. THE 2 OUT OF 4 COINCIDENCE MEMORY, AND "OR" LOGIC ARE DUPLICATED WITHIN EACH TRAIN. SEPARATE OUTPUT RELAYS ARE ALSO PROVIDED IN EACH TRAIN. TO MINIMIZE FALSE CONTAINMENT SPRAY, ONE OUTPUT RELAY SHOULD START THE PUMPS WHILE ANOTHER SHOULD OPEN THE SYSTEM VALVES.
15. CONTAINMENT SPRAY PUMP START IS INCLUDED IN THE SAFETY INJECTION SEQUENCE. SPRAY ACTUATION SIGNAL CONFIRMS SPRAY PUMP START AND OPENS SYSTEM VALVES. IF CONDITIONS OF NOTE 11 APPLY, THE SEQUENCE INTERLOCK SHOULD BE SUCH THAT SPRAY WILL START WITHIN THE REQUIRED TIME INDEPENDANT OF THE SAFETY INJECTION SIGNAL STATUS.
16. THE ENCLOSED CIRCUITRY IS COMMON TO BOTH UNITS 1 AND 2. ALL OTHER CIRCUITS ARE APPLICABLE TO EITHER UNIT 1 OR 2.
17. CONTAINMENT AIR MONITOR HDNNE CHANNEL RE-5866 IS NOT REQUIRED FOR CONTAINMENT VENTILATION ISOLATION.
18. EACH OF THE FOUR MONITORS WILL, UPON DETECTION OF HIGH RADIATION, PROVIDE SIGNALS TO BOTH TRAINS OF THE CONTROL ROOM EMERGENCY RECIRCULATION ACTUATION. CROSS TRAIN TRIPPING IS ACCOMPLISHED VIA QUALIFIED ISOLATION DRIVES.
19. CONTAINMENT AIR MONITORS SHOWN PROVIDE SIGNALS TO BOTH TRAINS.
20. THE CONTROL ROOM EMERGENCY RECIRCULATION ACTUATION RESET SWITCHES ARE MOUNTED ON THE HVAC PANEL BEHIND THE NIS RACKS.

7247D05 SH 8  
 COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 FUNCTIONAL DIAGRAM  
 7.2-1 SH 8

AMENDMENT 76  
 May 1, 1989



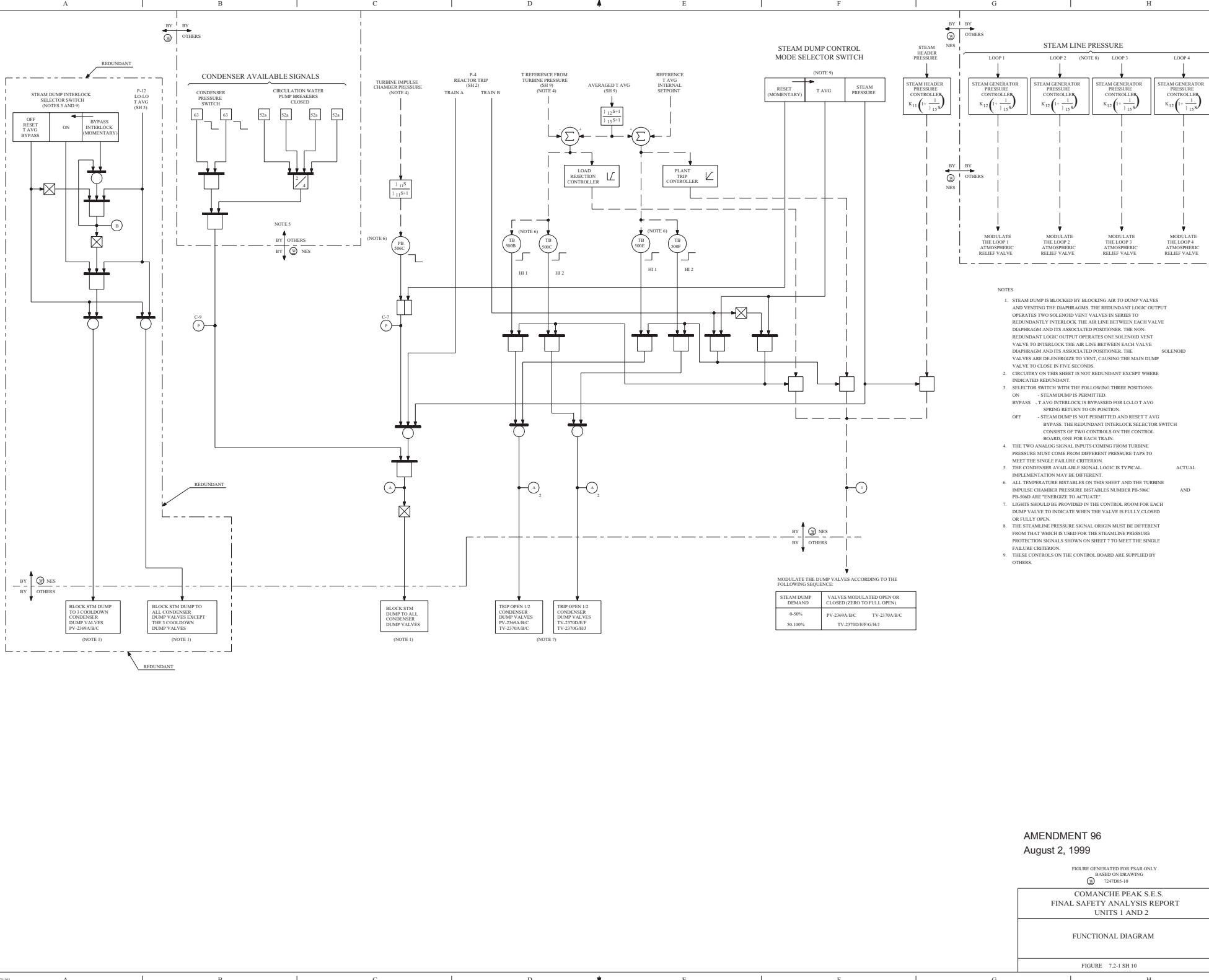
- NOTES
1. ALL CIRCUITS ON THIS SHEET ARE NOT REDUNDANT.
  2. KQT MAY VARY INVERSELY PROPORTIONAL TO LOAD WITH A FIXED LIMIT OR MAY VARY IN TWO DISCRETE STEPS WITH BREAK POINTS AT 30-50% AND 60-80% TURBINE LOAD.
  3. THE SUMMER OUTPUTS HAVE FIXED MANUALLY ADJUSTABLE UPPER LIMITS.
  4. THE ROD DIRECTION HISTABLES SB-412A AND SB-412B ARE ENERGIZED TO ACTUATE.
  5. ALARM 1, ALARM 2, ALARM 3 AND ALARM 4 MUST HAVE REFRESH CAPABILITY.
  6. THESE CONTROLS ON THE CONTROL BOARD ARE SUPPLIED BY OTHERS.

AMENDMENT 96  
August 2, 1999

© 7247D05 SH 9  
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

FUNCTIONAL DIAGRAM

7.2-1 SH 9



AMENDMENT 96  
August 2, 1999

FIGURE GENERATED FOR FSAR ONLY  
BASED ON DRAWING  
7247D05-10

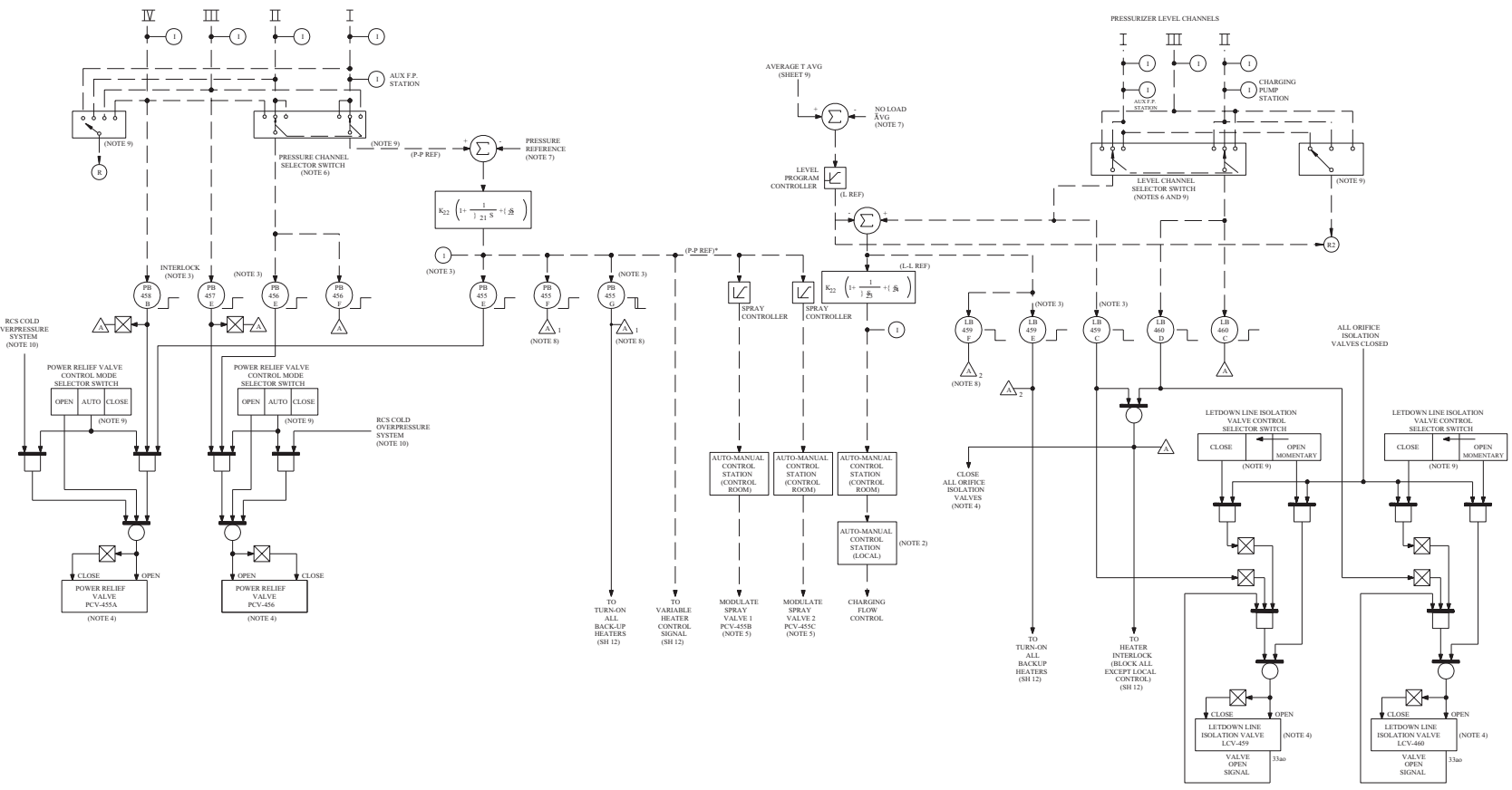
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

FUNCTIONAL DIAGRAM

FIGURE 72-1 SH 10

PRESSURIZER PRESSURE CHANNELS

PRESSURIZER LEVEL CHANNELS

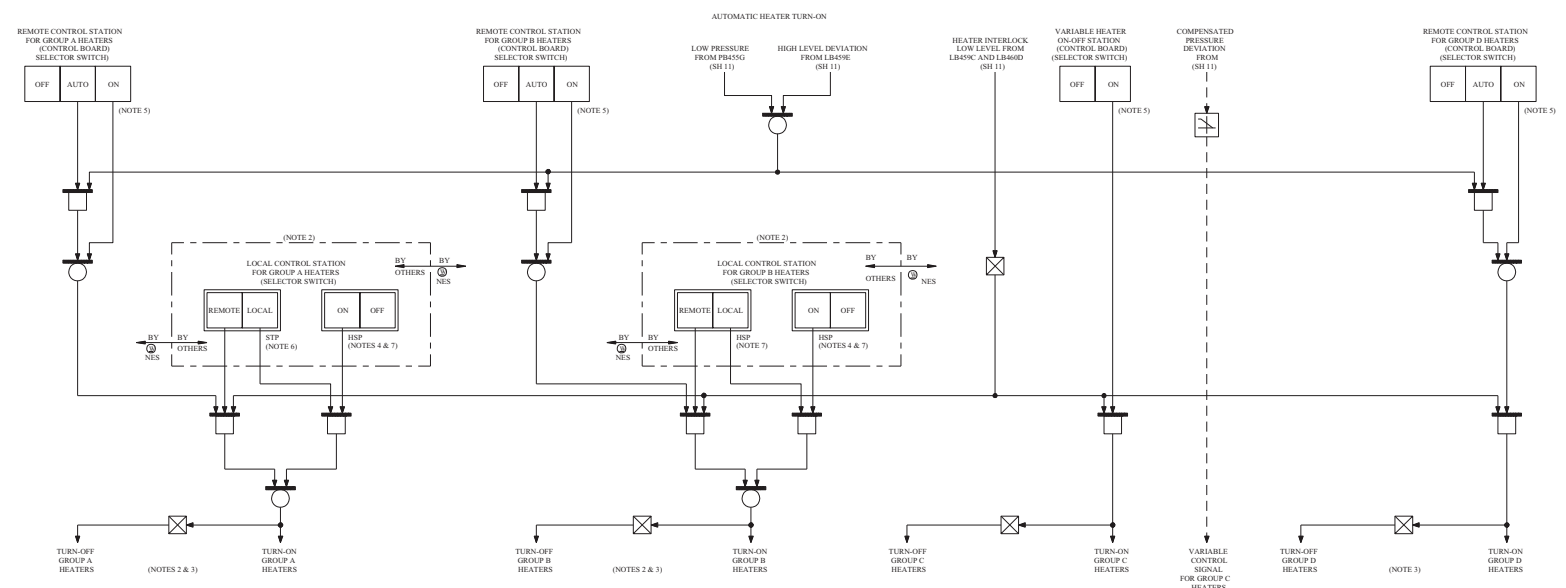


- NOTES
1. ALL CIRCUITS ON THIS SHEET ARE NOT REDUNDANT.
  2. LOCAL CONTROL OVERRIDES ALL OTHER SIGNALS. LOCAL OVERRIDE ACTUATES ALARM IN CONTROL ROOM.
  3. PRESSURE BISTABLES NO. PB-455E, PB-455G, PB-456E, PB-457E, AND PB-458E AND LEVEL BISTABLES NO. LB-459C, LB-459E AND LB-460D ARE ENERGIZABLE TO ACTIVATE.
  4. OPEN/SHUT INDICATION IN CONTROL ROOM.
  5. A LIGHT SHIELD BE PROVIDED IN THE CONTROL ROOM FOR EACH SPRAY VALVE TO INDICATE WHEN IT IS NOT FULLY CLOSED.
  6. CENTER POSITION NORMALLY SELECTED.
  7. ADJUSTABLE SETPOINT WITHIN CONTROLLER.
  8. ALARM 1 AND ALARM 2 MUST HAVE FLASH CAPABILITY.
  9. THESE CONTROLS ON THE CONTROL BOARD ARE SUPPLIED BY OTHERS.
  10. LOGIC FOR THIS SYSTEM IS SHOWN ON INTERLOCK RC-5.

AMENDMENT 96  
August 2, 1999

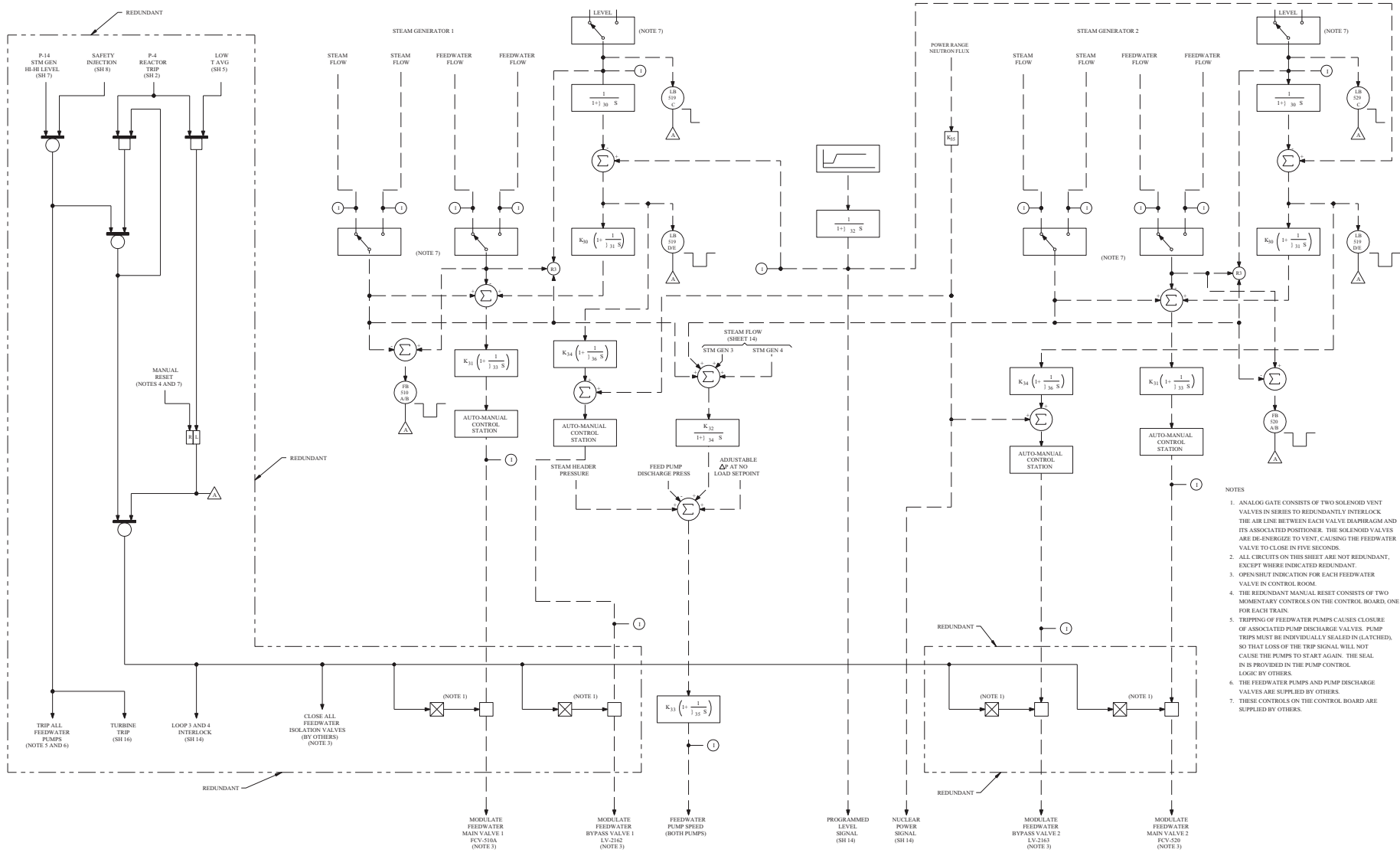
© 7247D05 SH 11 COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
FUNCTIONAL DIAGRAM
7.2-1 SH 11

- NOTES
1. ALL CIRCUITS ON THIS SHEET ARE NOT REDUNDANT.
  2. GROUP A AND GROUP B HEATERS MUST BE ON SEPARATE VITAL POWER SUPPLIES WITH THE LOCAL CONTROL SEPARATED SO THAT ANY SINGLE FAILURE DOES NOT DEFEAT BOTH.
  3. BACK-UP HEATER STATUS INDICATION IN CONTROL ROOM.
  4. PRECAUTIONS SHOULD BE TAKEN TO AVOID MANUAL HEATER OPERATION, WHICH WOULD CAUSE HEATER DAMAGE, IF THE WATER LEVEL UNCOVERS THE HEATERS.
  5. SUPPLIED BY OTHERS.
  6. STP - SHUTDOWN TRANSFER PANEL.
  7. HSP - HOT SHUTDOWN PANEL.



AMENDMENT 76  
May 1, 1989

FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING 7247D05 SH 12
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUNCTIONAL DIAGRAM
FIGURE 72-1 SH 12



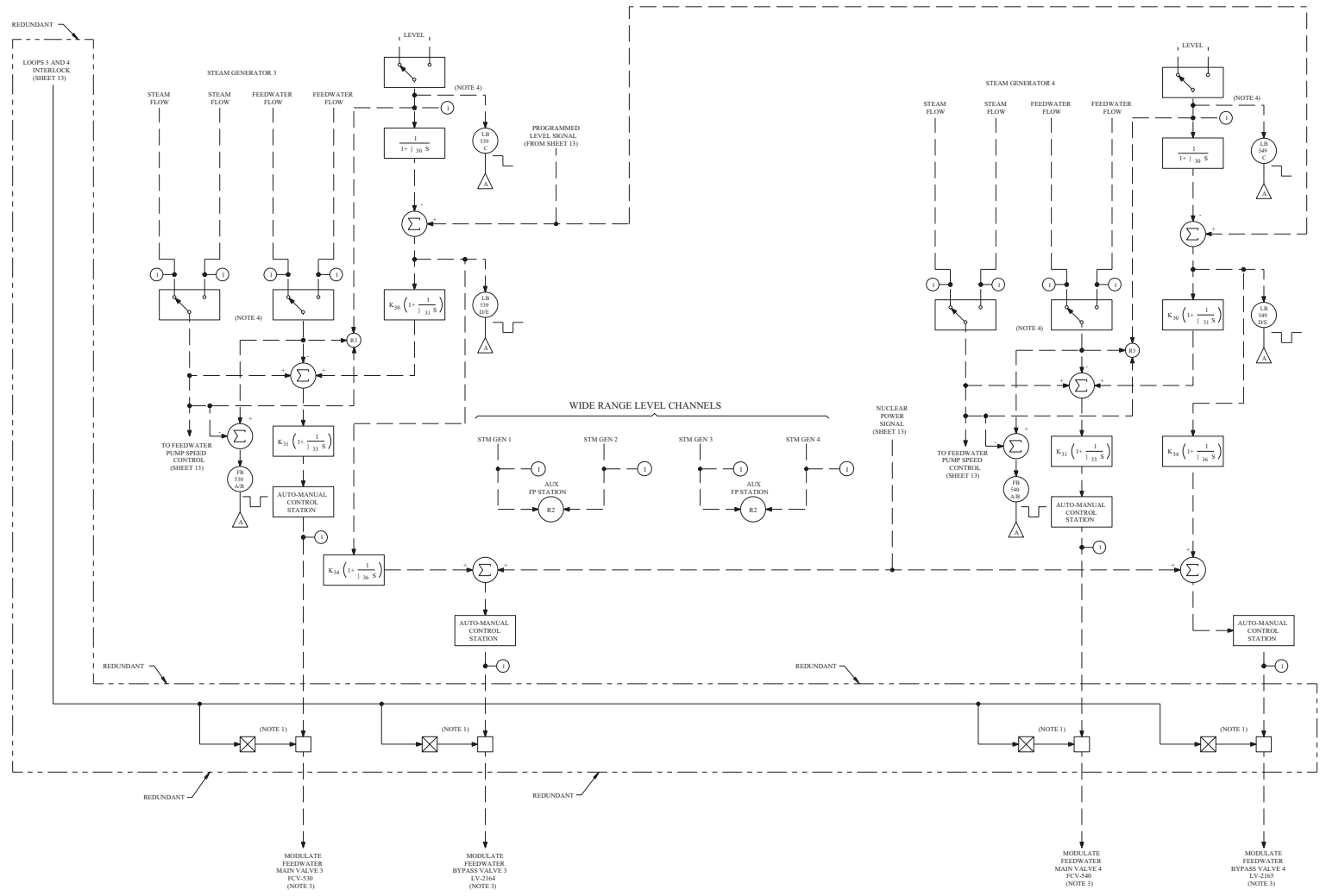
- NOTES
1. ANALOG GATE CONSISTS OF TWO SOLENOID VENT VALVES IN SERIES TO REDUNDANTLY INTERLOCK THE AIR LINE BETWEEN EACH VALVE DIAPHRAGM AND ITS ASSOCIATED POSITIONER. THE SOLENOID VALVES ARE DE-ENERGIZE TO VENT, CAUSING THE FEEDWATER VALVE TO CLOSE IN FIVE SECONDS.
  2. ALL CIRCUITS ON THIS SHEET ARE NOT REDUNDANT, EXCEPT WHERE INDICATED REDUNDANT.
  3. OPENSIGHT INDICATION FOR EACH FEEDWATER VALVE IN CONTROL ROOM.
  4. THE REDUNDANT MANUAL RESET CONSISTS OF TWO MOMENTARY CONTROLS ON THE CONTROL BOARD, ONE FOR EACH TRAIN.
  5. TRIPPING OF FEEDWATER PUMPS CAUSES CLOSURE OF ASSOCIATED PUMP DISCHARGE VALVES. PUMP TRIPS MUST BE INDIVIDUALLY SEALED IN (LATCHED), SO THAT LOSS OF THE TRIP SIGNAL WILL NOT CAUSE THE PUMPS TO START AGAIN. THE SEAL IN IS PROVIDED IN THE PUMP CONTROL LOGIC BY OTHERS.
  6. THE FEEDWATER PUMPS AND PUMP DISCHARGE VALVES ARE SUPPLIED BY OTHERS.
  7. THESE CONTROLS ON THE CONTROL BOARD ARE SUPPLIED BY OTHERS.

AMENDMENT 96  
 August 2, 1999

© 7247D05 SH 13  
 COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2

FUNCTIONAL DIAGRAM

7.2-1 SH 13

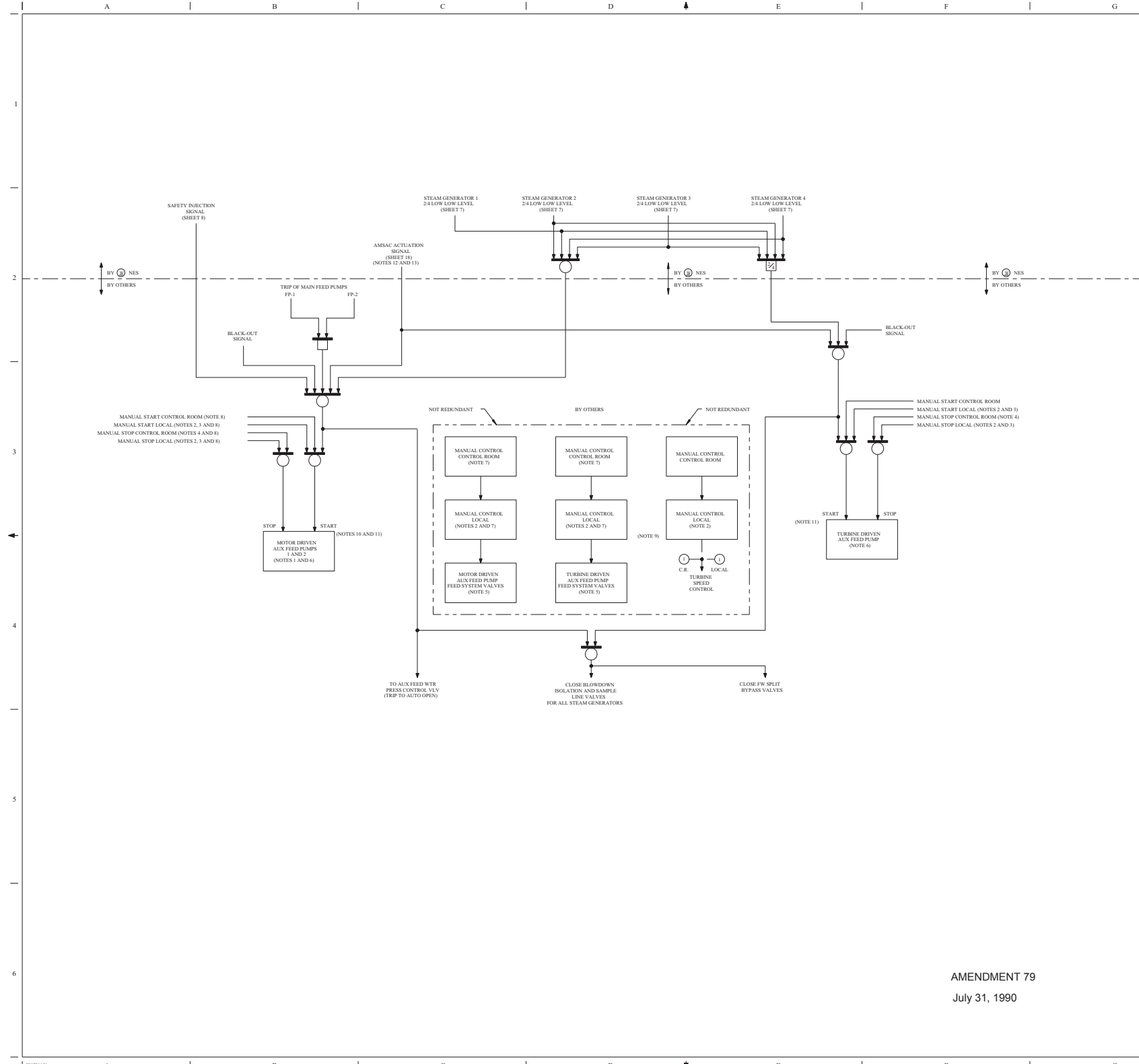


- NOTES:
1. ANALOG GATE CONSISTS OF TWO SOLENOID VENT VALVES IN SERIES TO REDUNDANTLY INTERLOCK THE AIR LINE BETWEEN EACH VALVE DIAGRAM AND ITS ASSOCIATED POSITIONER. THE SOLENOID VALVES ARE DE-ENERGIZED TO VENT, CAUSING THE FEEDWATER VALVE TO CLOSE IN FIVE SECONDS.
  2. ALL CIRCUITS ON THIS SHEET ARE NOT REDUNDANT, EXCEPT WHERE INDICATED REDUNDANT.
  3. OPEN SHUT INDICATION FOR EACH FEEDWATER MAIN VALVE IN CONTROL ROOM.
  4. THESE CONTROLS ON THE CONTROL BOARD ARE SUPPLIED BY OTHERS.

AMENDMENT 76  
May 1, 1989

FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING 7247D05 SH 14 COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUNCTIONAL DIAGRAM
FIGURE 7.2-1 SH 14





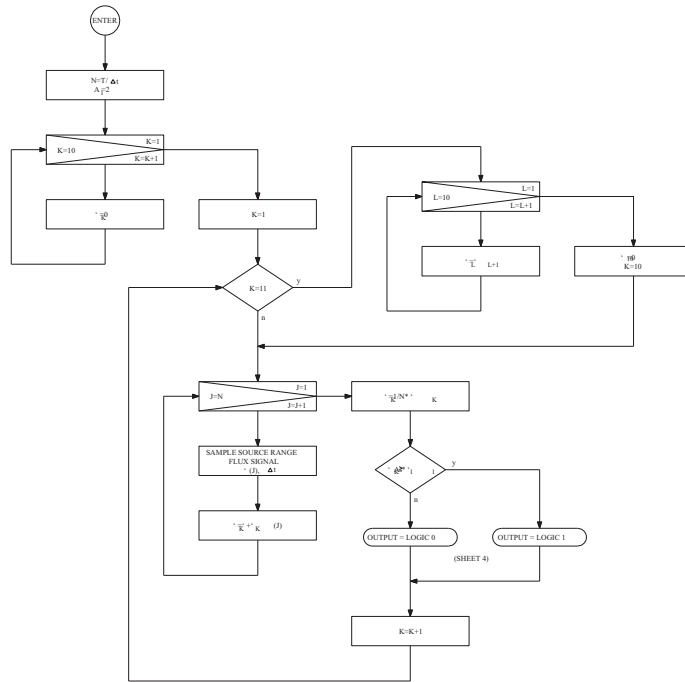
- NOTES
1. TRAIN A CONTROLS MAFP 1: BREAKER NUMBER. TRAIN B CONTROLS MAFP 2: BREAKER NUMBER.
  2. LOCAL CONTROL OVERRIDES ALL OTHER SIGNALS.
  3. LOCAL OVERRIDE ACTUATES ALARM IN CONTROL ROOM.
  4. MANUAL STOP AND PULL OVERRIDES THE AUTOMATIC START. MANUAL STOP OVERRIDE ACTUATES ALARM IN CONTROL ROOM.
  5. OPEN SHUT INDICATION IN CONTROL ROOM.
  6. PUMP OPERATING LIGHTS IN CONTROL ROOM.
  7. INDIVIDUAL FOR EACH VALVE.
  8. INDIVIDUAL FOR EACH PUMP.
  9. THE TURBINE SPEED CONTROL IS TYPICAL. ACTUAL IMPLEMENTATION MAY NOT INCLUDE SPEED CONTROL.
  10. THE PUMP START MAY BE DELAYED AND SEQUENCED IF THE EMERGENCY DIESEL POWER CAPABILITY IS LESS THAN THE TOTAL LOAD WITH ALL SYSTEMS STARTING. THE TIME DELAY, IF USED, MAY NOT EXCEED THE MAXIMUM STARTING TIME REQUIREMENTS FOR THIS SYSTEM.
  11. THE PUMP START MUST BE SEALED IN (LATCHED), SO THAT LOSS OF THE ACTUATION SIGNAL WILL NOT CAUSE THE PUMP TO STOP.
  12. THE AMSAC SIGNAL IS NOT REDUNDANT. ITS SIGNAL IS DUPLICATED FOR INPUT TO EACH AUXILIARY FEEDWATER ACTUATION CIRCUIT. ISOLATION DEVICES ARE PROVIDED BETWEEN THE NON-IE AMSAC CIRCUITS AND THE IE AUXILIARY FEEDWATER START CIRCUITS.
  13. INPUT TO THE AUXILIARY FEEDWATER ACTUATION CIRCUIT IS AT THE FINAL ACTUATION DEVICE FOR EACH AUXILIARY FEEDWATER TRAIN.

AMENDMENT 79  
July 31, 1990

FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING ② 7247D05 SH 15
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUNCTIONAL DIAGRAM
FIGURE 72-1 SH 15



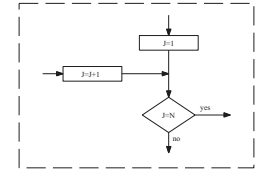
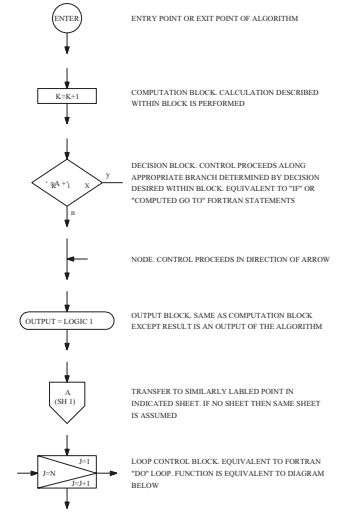
SOURCE RANGE FLUX - DOUBLING ALGORITHM



DEFINITIONS OF VARIABLES

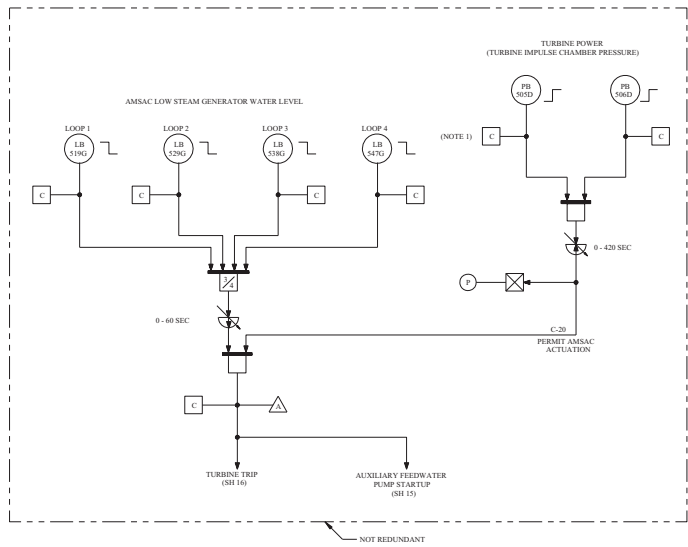
SYMBOL	DEFINITION	TYPE
$\bar{K}$	FLUX AVERAGE	REAL VARIABLE
T	TIME INTERVAL OVER WHICH AVERAGE IS TAKEN	REAL ADDRESSABLE CONSTANT
$\Delta t$	SAMPLING PERIOD	REAL ADDRESSABLE CONSTANT
N	# SAMPLES IN AVERAGING INTERVAL	INTEGER
$A_j$	COEFFICIENT IN FLUX AVERAGE COMPARISON	INTEGER

FLOW CHART SYMBOLS



AMENDMENT 76  
May 1, 1989

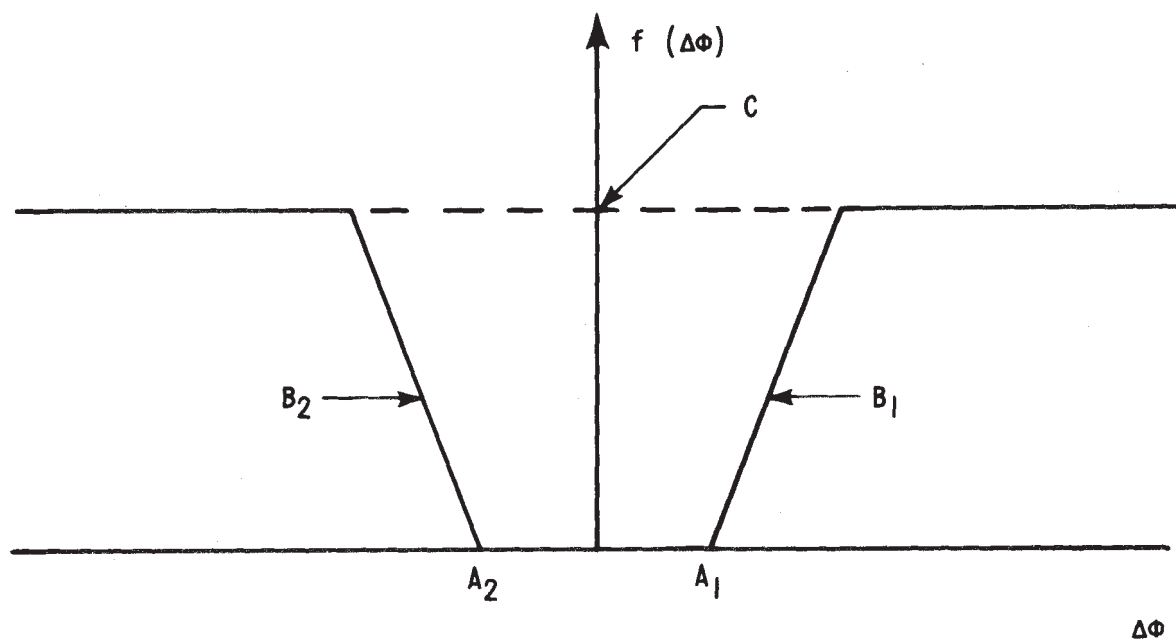
FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING Q 7247D05 SH 17
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUNCTIONAL DIAGRAM
FIGURE 7.2-1 SH 17



NOTES  
 1. AMSAC MAY BE REMOVED FROM SERVICE FOR TEST PURPOSES.

AMENDMENT 76  
 May 1, 1989

FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING 7247D05 SH 18 COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUNCTIONAL DIAGRAM
FIGURE 7.2-1 SH 18



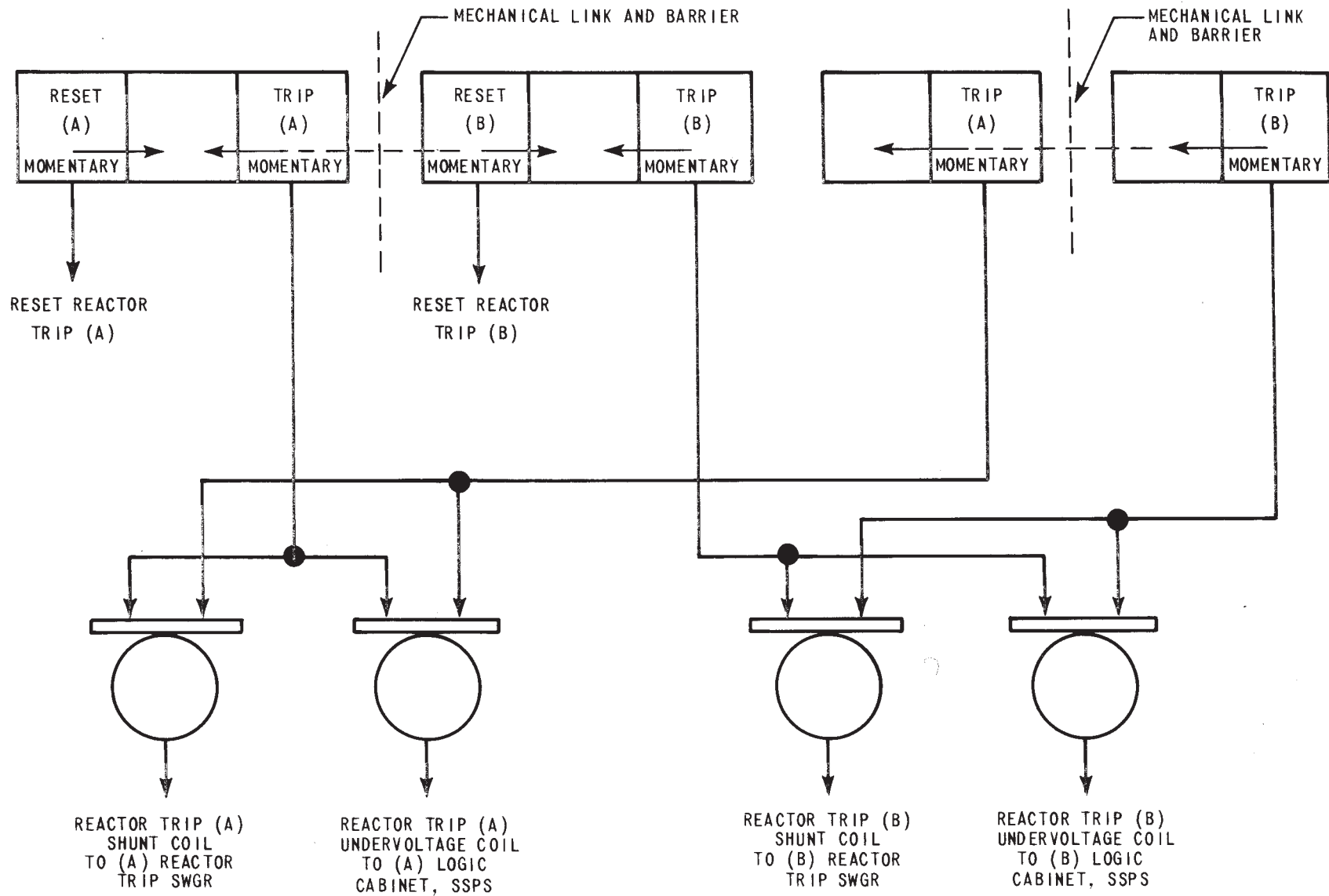
- $\Delta\phi$  - NEUTRON FLUX DIFFERENCE BETWEEN UPPER AND LOWER LONG ION CHAMBERS
- $A_1, A_2$  - LIMIT OF  $F(\Delta\phi)$  DEADBAND
- $B_1, B_2$  - SLOPE OF RAMP: DETERMINES RATE AT WHICH FUNCTION REACHES IT'S MAXIMUM VALUE ONCE DEADBAND IS EXCEEDED
- $C$  - MAGNITUDE OF MAXIMUM VALUE THE FUNCTION MAY ATTAIN

Amendment 76  
May 1, 1989

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Setpoint Reduction Function  
For Overtemperatures N16 Trips

FIGURE 7.2-2

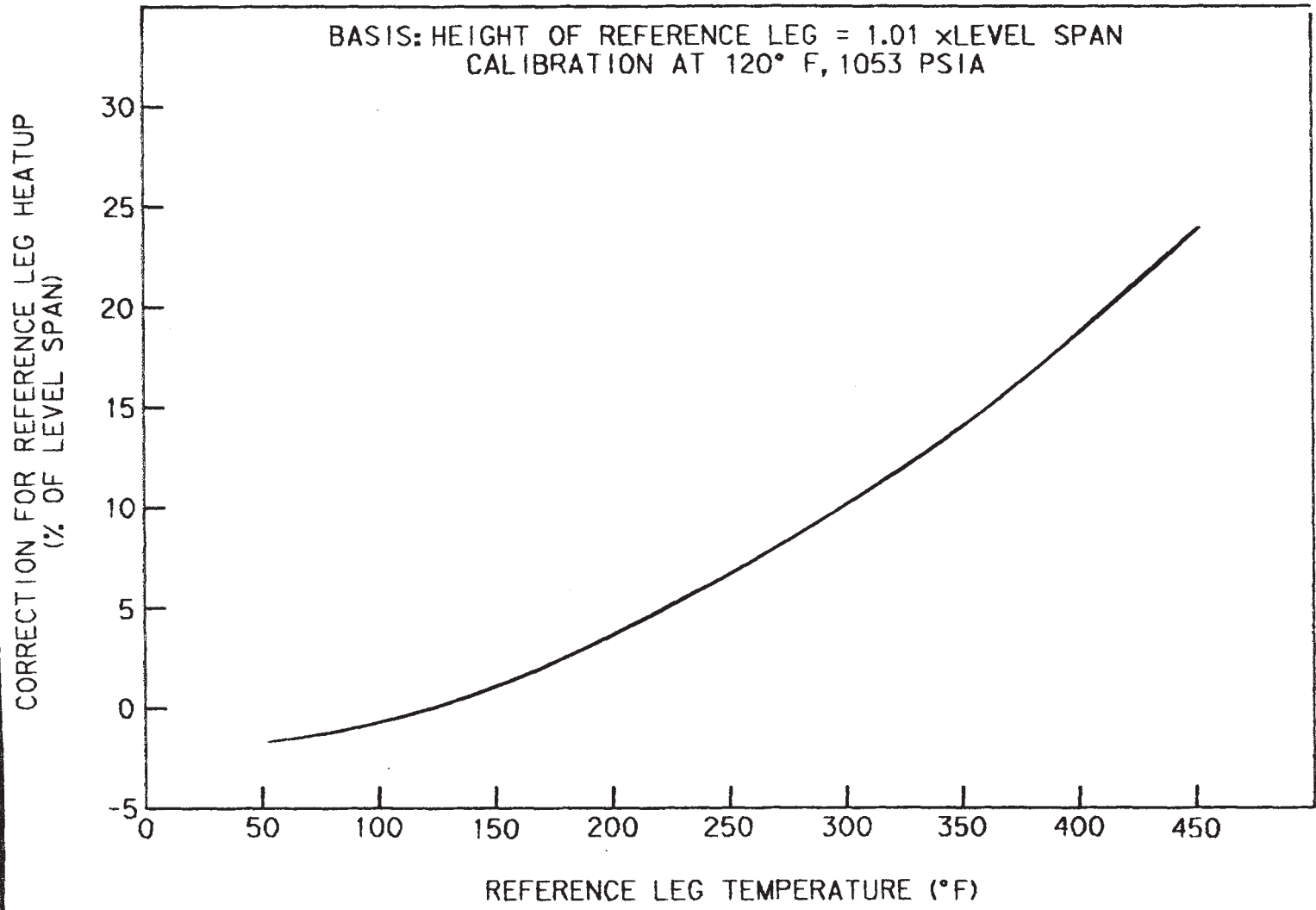


COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2

Reactor Trip/ESF  
 Actuation Mechanical Linkage

FIGURE 7.2-3

BASIS: HEIGHT OF REFERENCE LEG = 1.01 x LEVEL SPAN  
CALIBRATION AT 120° F, 1053 PSIA



CORRECTION FOR REFERENCE LEG HEATUP  
(% OF LEVEL SPAN)

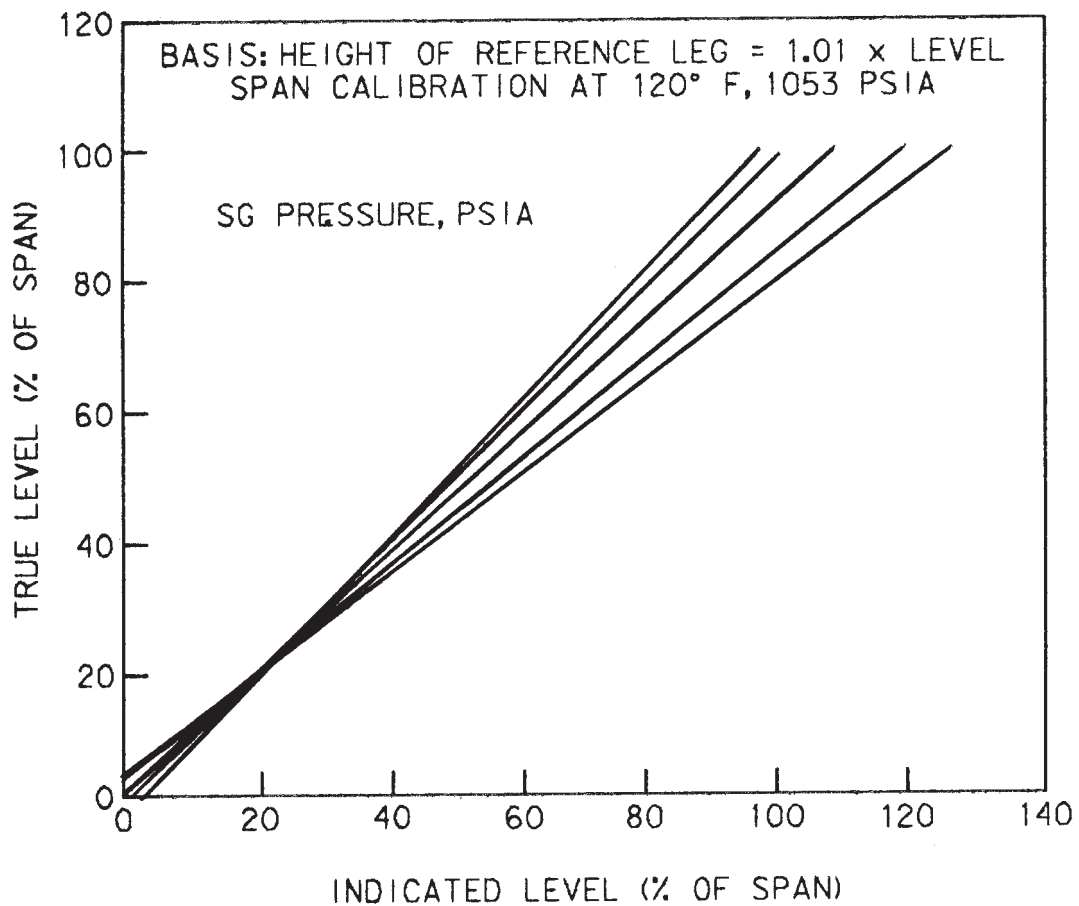
REFERENCE LEG TEMPERATURE (°F)

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

BIAS DUE TO STEAM GENERATOR  
REFERENCE LEG HEATUP

FIGURE 7.2.4

Amendment 91  
April 15, 1994



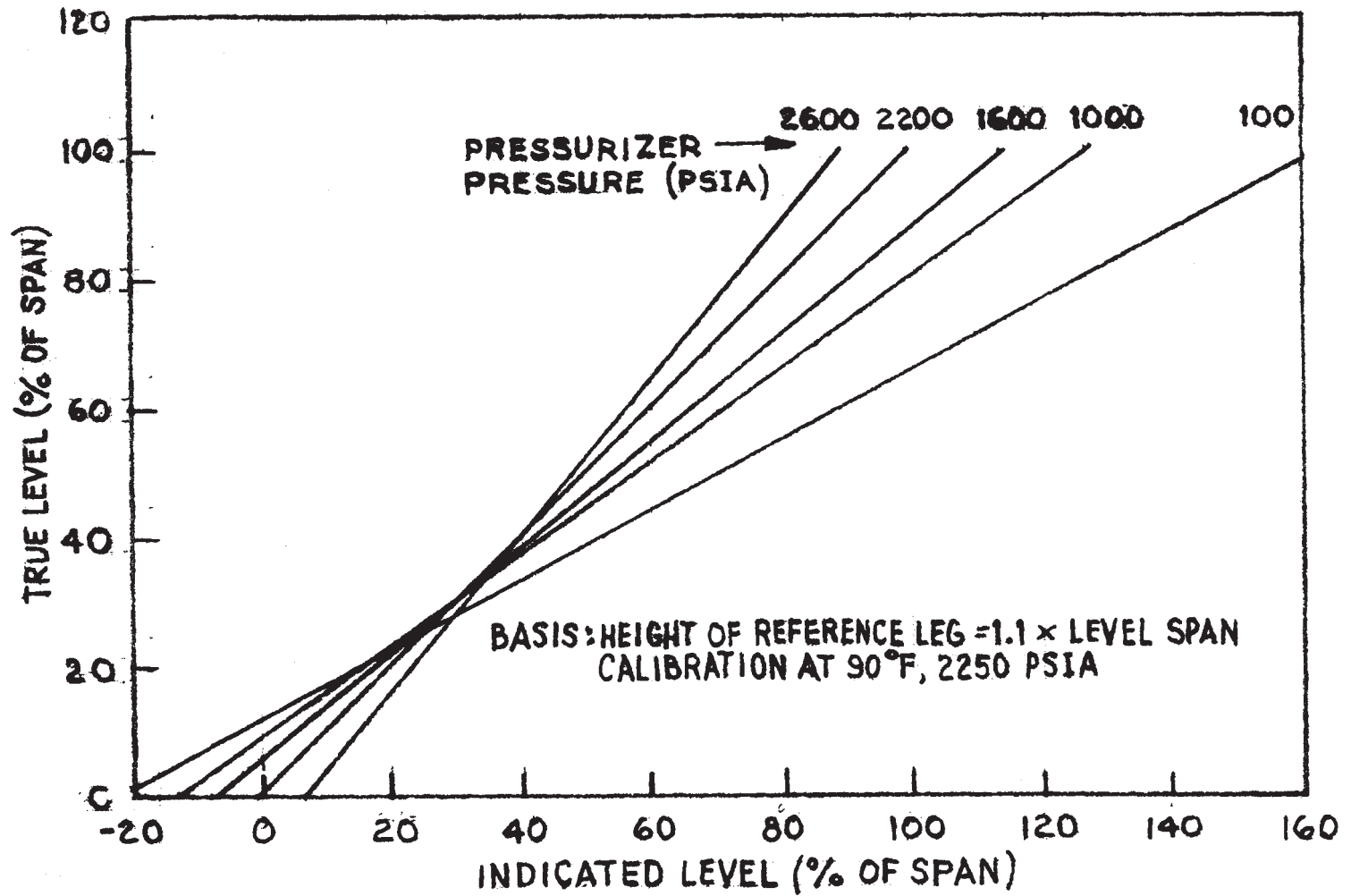
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

BIAS DUE TO STEAM GENERATOR  
PRESSURE CHANGE

FIGURE 7.2-5

Amendment 91  
April 15, 1994





COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

BIAS DUE TO PRESSURIZER  
PRESSURE CHANGE

FIGURE 7.2-6

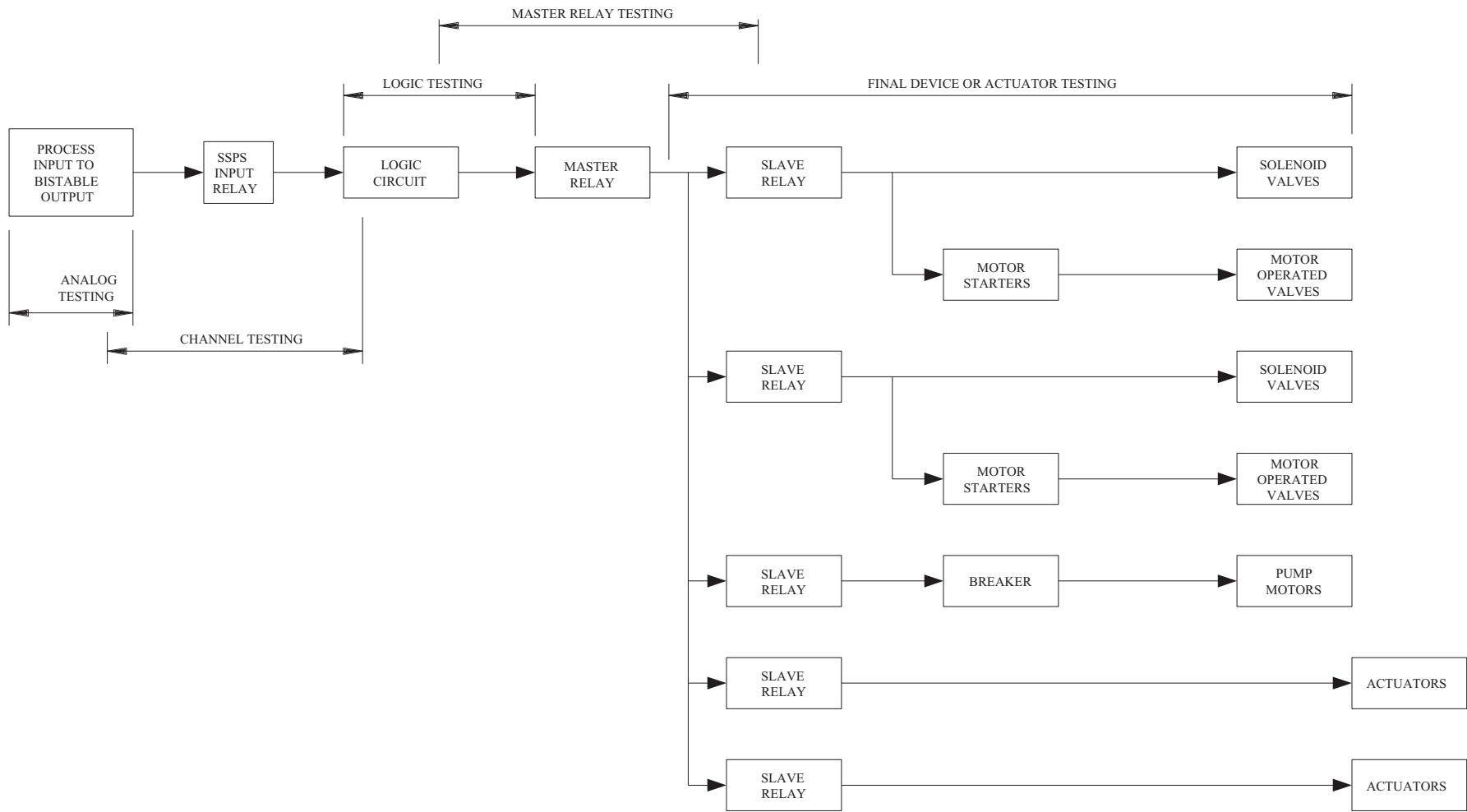
Amendment 91  
April 15, 1994

OCTOBER 8, 1980

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Deleted

FIGURE 7.3-1



COMANCHE PEAK S E S  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 AND 2

TYPICAL ESF TEST  
 CIRCUITS

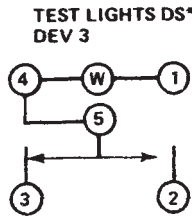
FIGURE 7.3-2

GENERAL NOTES:

1. CIRCUITRY AND HARDWARE FOR REDUNDANT PROTECTION TRAINS "A" AND "B" TEST CABINETS ARE DUPLICATE EXCEPT AS NOTED  
 A - TRAIN "A" ONLY  
 B - TRAIN "B" ONLY
2. IN DETAILS A & B THE SYMBOL \* REPRESENTS THE SUFFIX NUMBERS OF THE DEVICE REFERENCED.  
 K\* - SPS RELAY, K601, K602, ETC.  
 K(O) - OPERATING COIL  
 K(R) - RESET COIL  
 S\* - STC TEST SWITCH, S802, S834, ETC.  
 K8\* - STC RELAY, K811, K817, ETC.  
 DS\* - STC LIGHT, DS8009, DS8077, ETC.
3. "DETAIL "A" & "B" TYPE CIRCUITS ARE DETAILED ON THE SCHEMATICS. "DETAIL B" CIRCUITS WILL BE SUBSTITUTED FOR "DETAIL A" CIRCUITS WHERE REQUIRED.

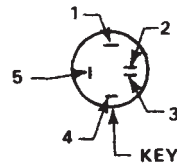
LOCATION LEGEND

- SPS - SOLID STATE PROTECTION SYSTEM
- STC - SAFEGUARDS TEST CABINET
- X - SWGR, MCC, AUXILIARY RELAY RACK, ETC.



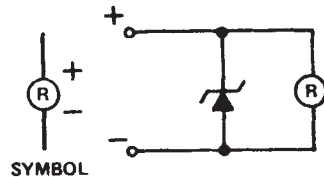
ILLUMINATED PUSHBUTTON SWITCH WITH 28V LAMP NO. 3327 (EXCEPT AS NOTED)

REAR OF PANEL



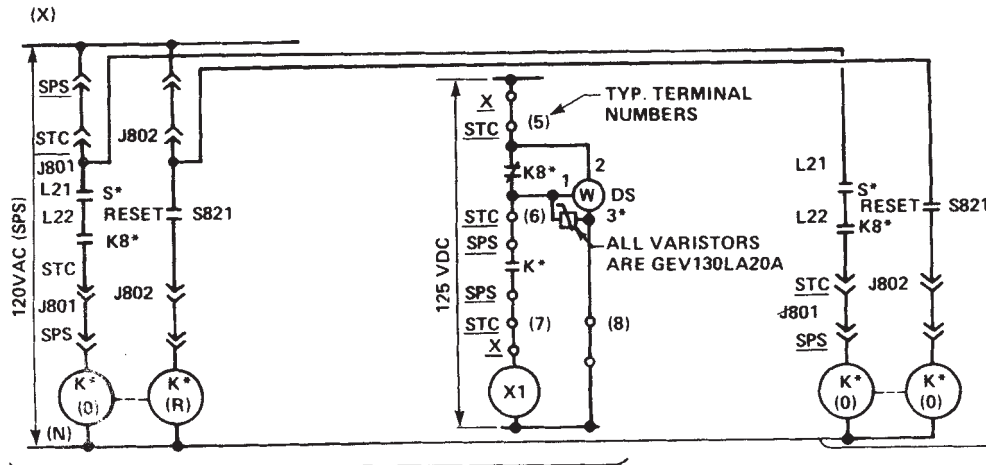
CONTACT LOCATION SCHEME

\*THE BASIS FOR THIS DRAWING IS WESTINGHOUSE 9555D15 SUB 1 SHEET 1 OF 20

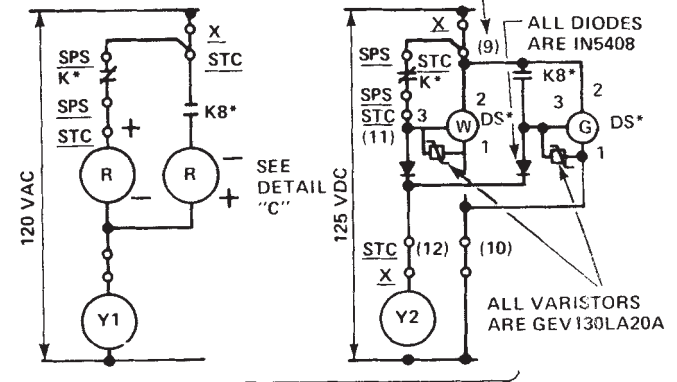


SYMBOL

DETAIL C CURRENT MONITOR DS\* LED WITH INTERNAL RESISTOR



DETAIL A TYPICAL PROTECTION ACTUATION CIRCUIT BLOCKING SCHEMES (CONTACT CLOSURE FOR ACTUATION)



DETAIL B TYPICAL PROTECTION ACTUATION CIRCUIT BLOCKING SCHEMES (CONTACT OPENING FOR ACTUATION)

COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 Engineered Safeguards Test  
 Cabinet, Index, Notes  
 and Legend\*  
 FIGURE 7.3-3.

AMENDMENT 11  
 JULY 31, 1980



- DELETED -

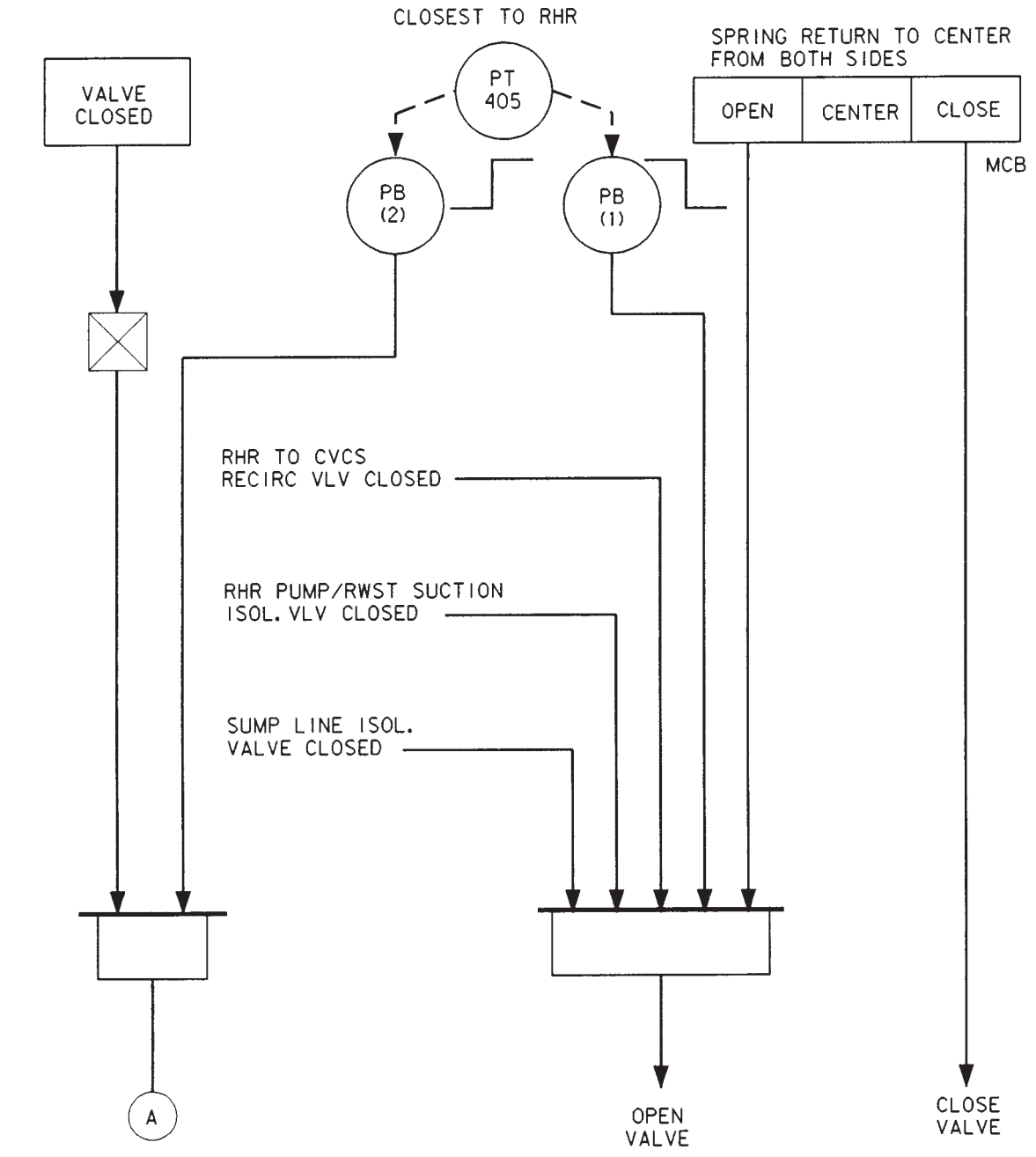
See FSAR Figure 8.3-15

AMENDMENT 12  
OCTOBER 8, 1980

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Instrumentation and Control  
Power Supply System

FIGURE 7.6-1



THIS DRAWING CREATED ELECTRONICALLY

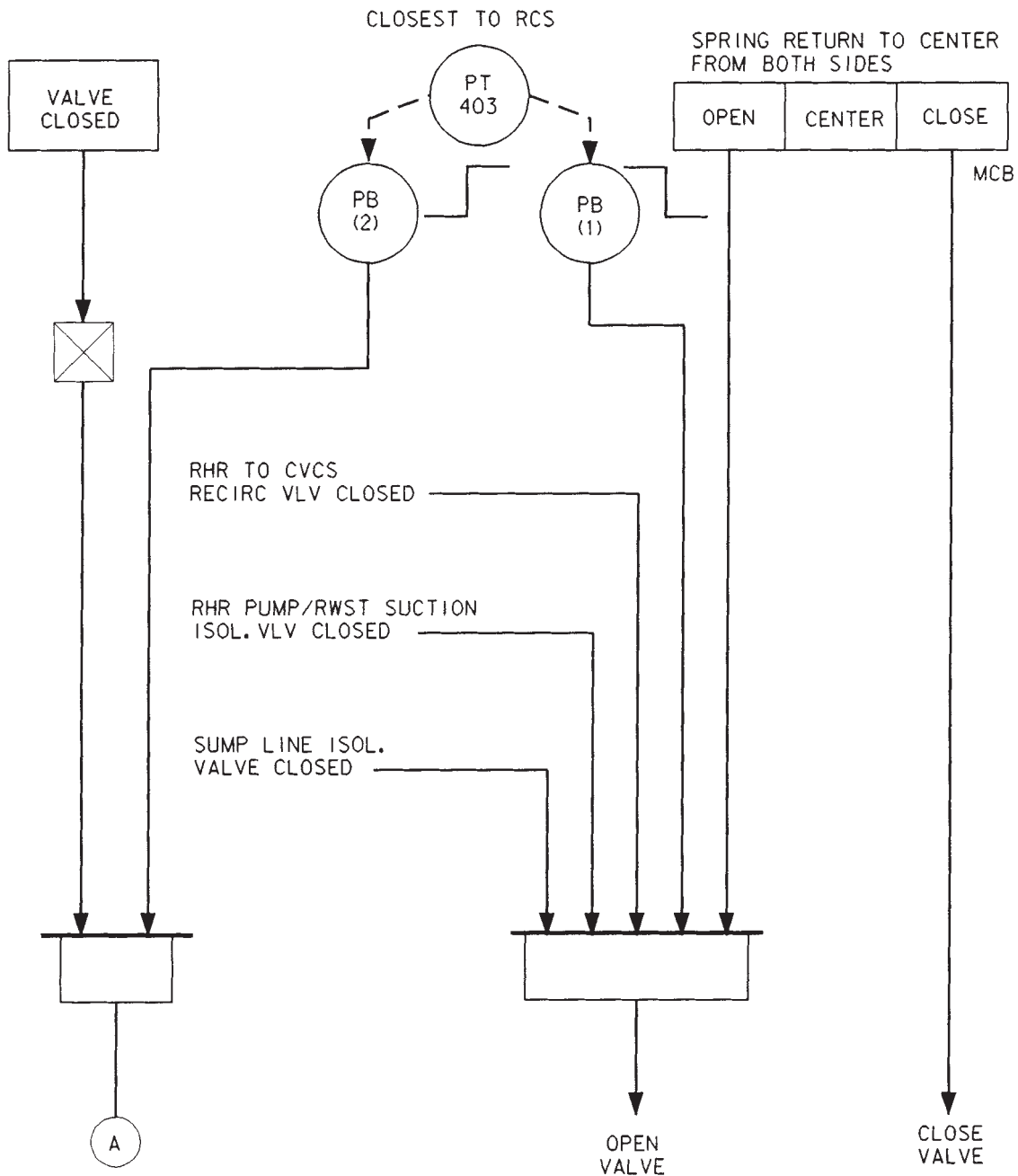
(1) DE-ENERGIZED AT LOW SETPOINT  
 (2) ENERGIZED AT HIGH PRESSURE SETPOINT

NOTE: LOGIC FOR VALVES IN EACH FLUID SYSTEM TRAIN IDENTICAL

— BISTABLE OUTPUT IS LOGIC "1" WHEN MEASURED PARAMETER IS GREATER THAN THE SETPOINT VALUE.  
 — BISTABLE OUTPUT IS LOGIC "1" WHEN MEASURED PARAMETER IS LESS THAN THE SETPOINT VALUE.

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
LOGIC DIAGRAM FOR (OUTER) RHR ISOLATION VALVE
FIGURE 7.6-2, SHEET 1


AMENDMENT 83  
 DECEMBER 13, 1991



THIS DRAWING CREATED ELECTRONICALLY

(1) DE-ENERGIZED AT LOW SETPOINT  
 (2) ENERGIZED AT HIGH PRESSURE SETPOINT

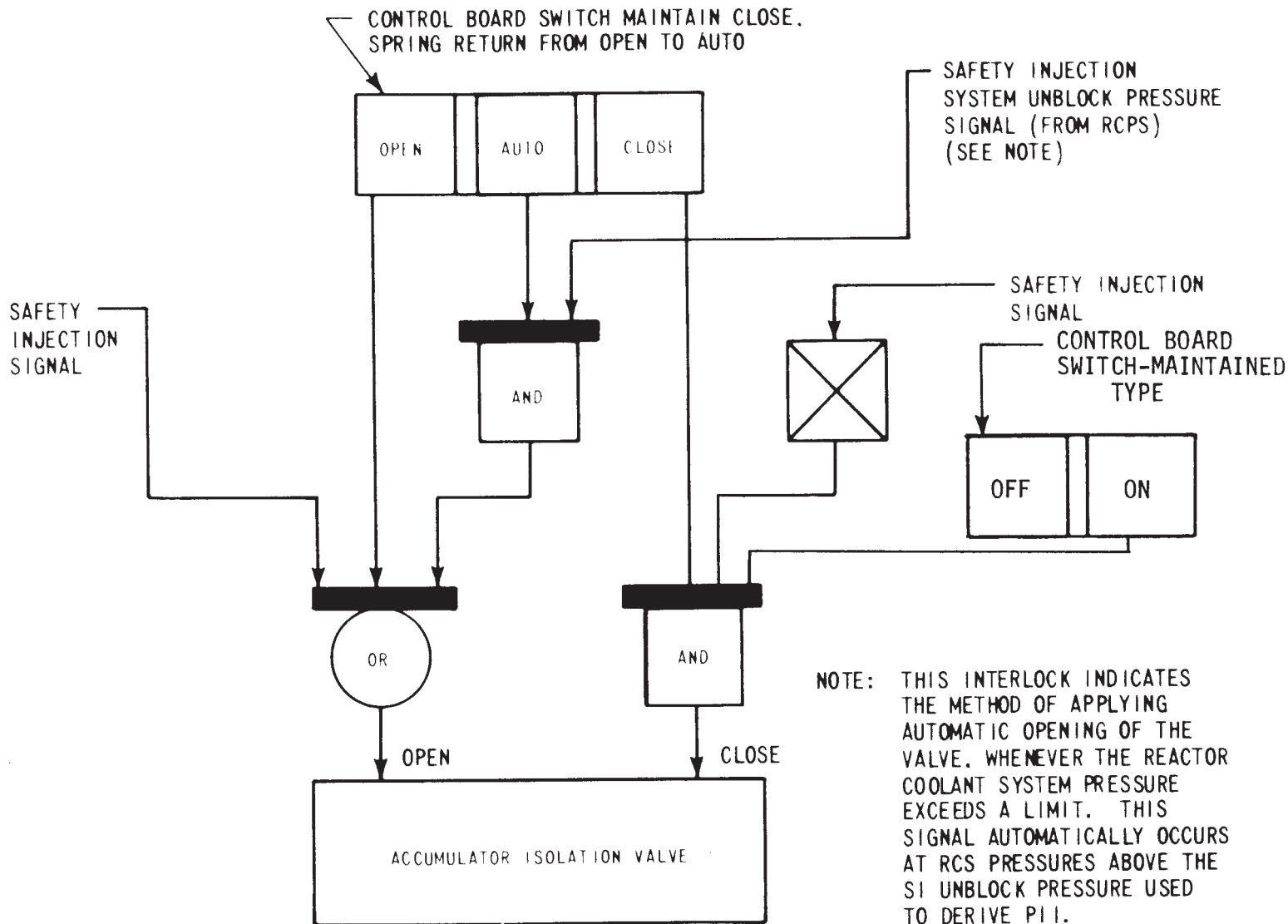
NOTE: LOGIC FOR VALVES IN EACH FLUID SYSTEM TRAIN IDENTICAL


 BISTABLE OUTPUT IS LOGIC "1" WHEN MEASURED  
 PARAMETER IS GREATER THAN THE SETPOINT  
 VALUE.  
 BISTABLE OUTPUT IS LOGIC "1" WHEN MEASURED  
 PARAMETER IS LESS THAN THE SETPOINT VALUE.

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
LOGIC DIAGRAM FOR (INNER) RHR ISOLATION VALVE
FIGURE 7.6-2, SHEET 2

AMENDMENT 83  
 DECEMBER 13, 1991





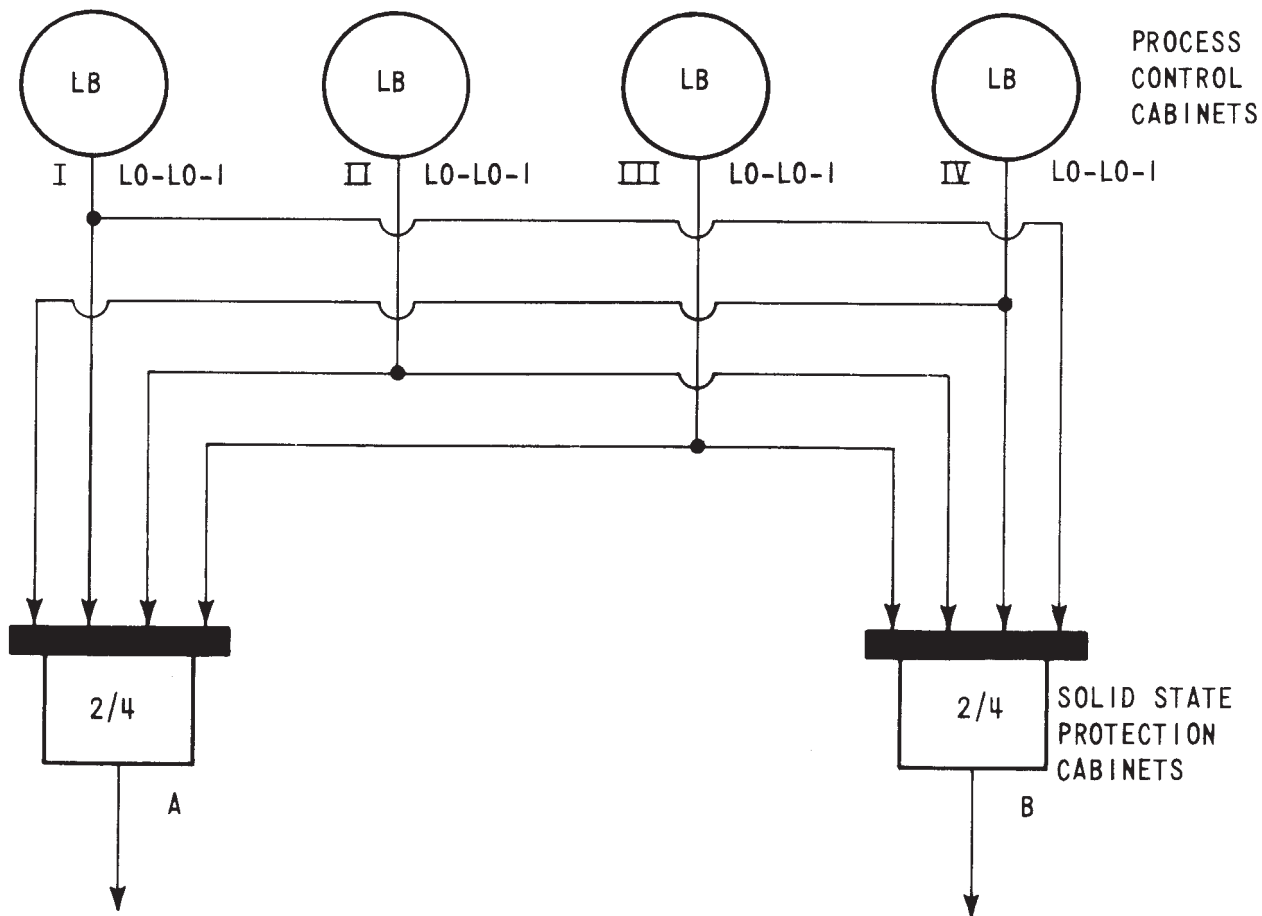
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Functional Block Diagram  
of Accumulator Isolation Valve

FIGURE 7.6-3

RWST LEVEL CHANNEL BISTABLES

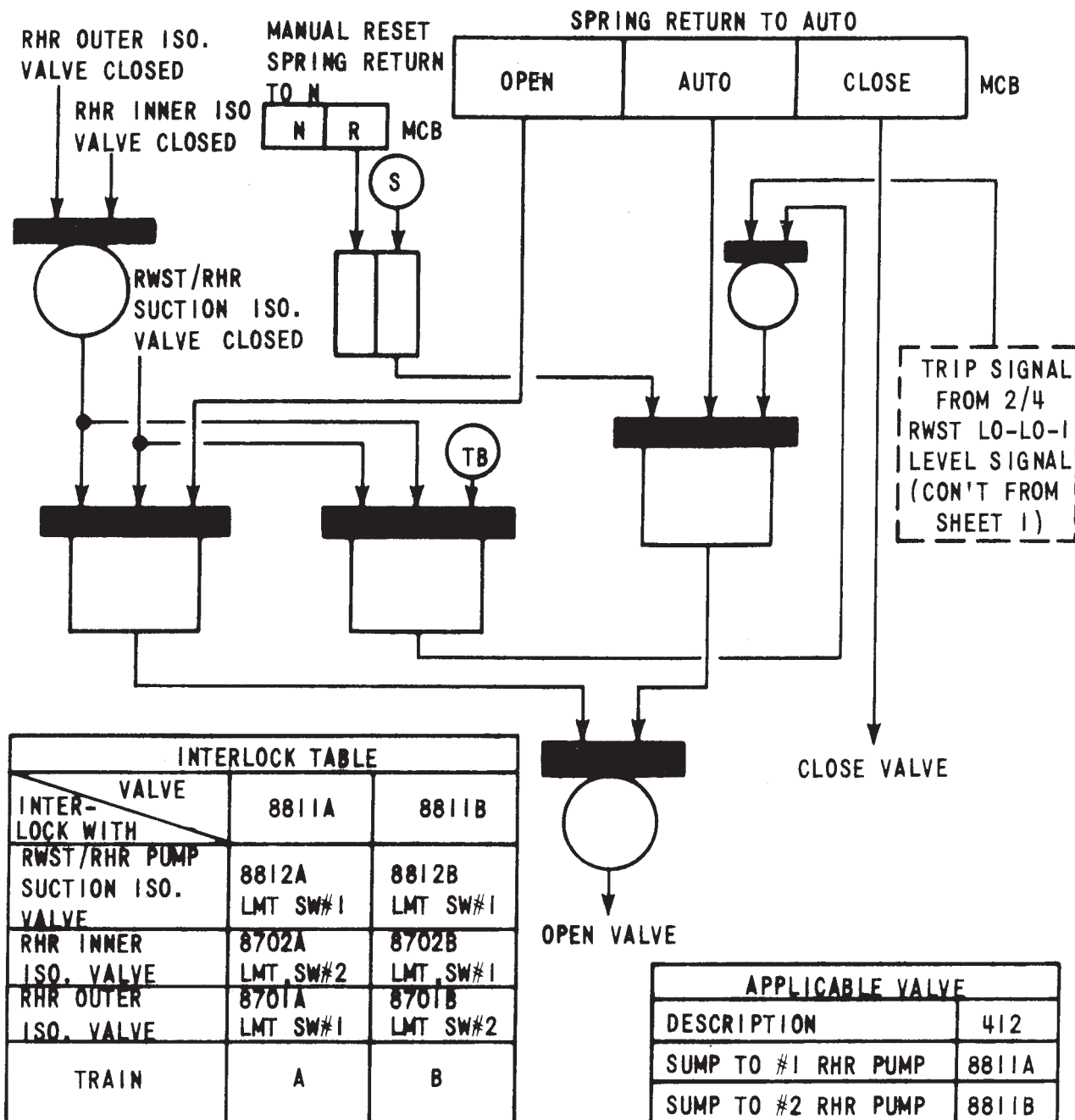
- 1) NORMALLY DE-ENERGIZED
- 2) DE-ENERGIZED ON LOSS OF POWER
- 3) TRIP SIGNAL PROVIDED WHEN ENERGIZED
- 4) ENERGIZED ON LO-LO-1 SETPOINT



TRIP SIGNAL TO  
AUTOMATICALLY OPEN  
SUMP ISOLATION VALVE  
8811A  
(CON'T ON SHEET 2)

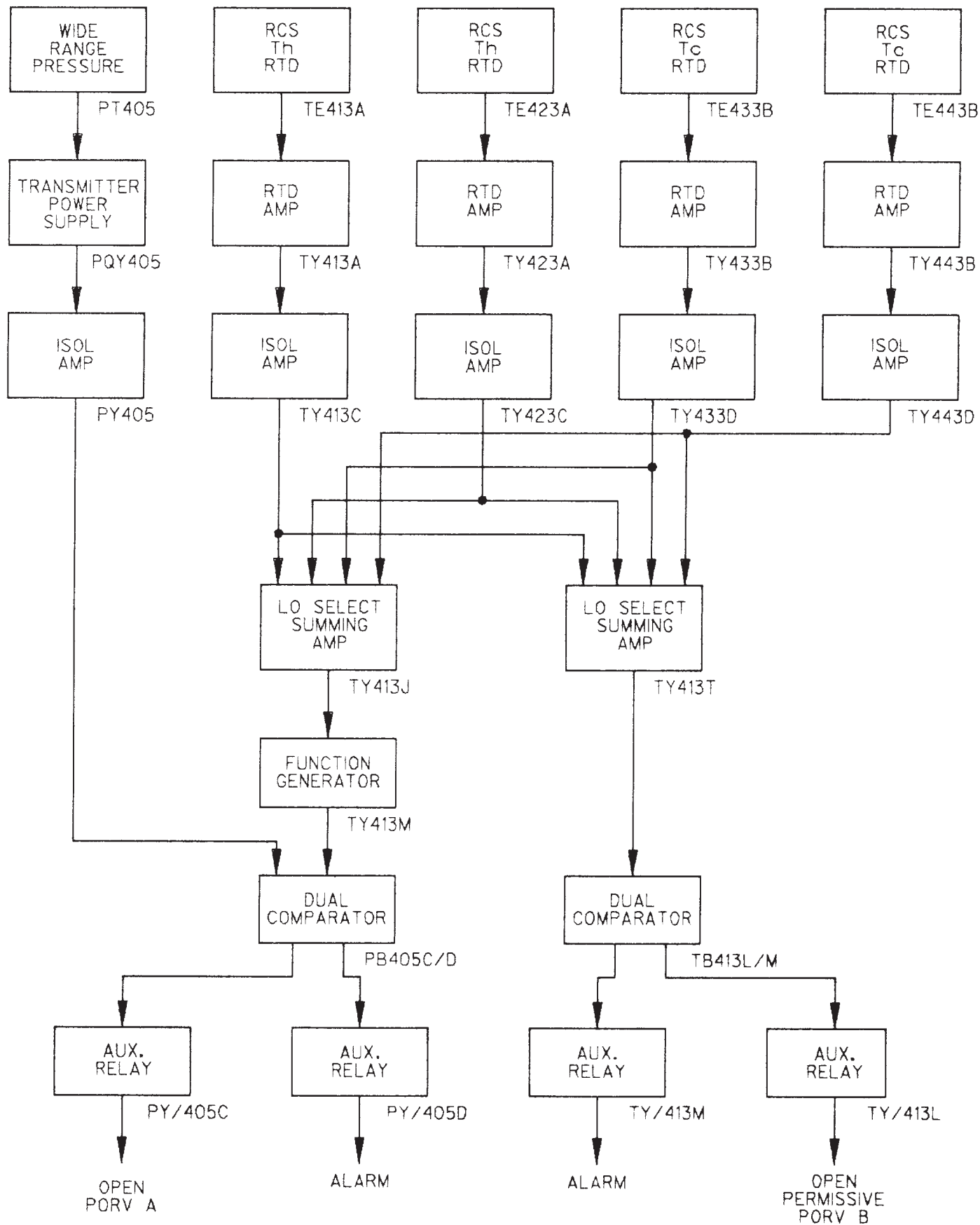
TRIP SIGNAL TO  
AUTOMATICALLY OPEN  
SUMP ISOLATION VALVE  
8811B  
(CON'T ON SHEET 2)

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
Safety Injection System Recirculation Sump Isolation Valves
FIGURE 7.6-4, Sheet 1



LIMIT SWITCH #1 IS THE NORMAL POSITION SIGNAL AND IS USED FOR POSITION SIGNALS BETWEEN VALVES ASSIGNED TO THE SAME TRAIN.  
 LIMIT SWITCH #2 IS THE STEM MOUNTED POSITION SWITCH AND IT IS USED FOR POSITION SIGNALS BETWEEN VALVES ASSIGNED TO OPPOSITE TRAINS.

COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2  
 Safety Injection System  
 Recirculation Sump Isolation  
 Valves  
 FIGURE 7.6-4, Sheet 2



NOTES: 1. LOGIC FOR PORV A (AND PERMISSIVE FOR PORV B) IS SHOWN. REDUNDANT LOGIC FOR PORV B (AND PERMISSIVE FOR PORV A) IS SIMILAR.

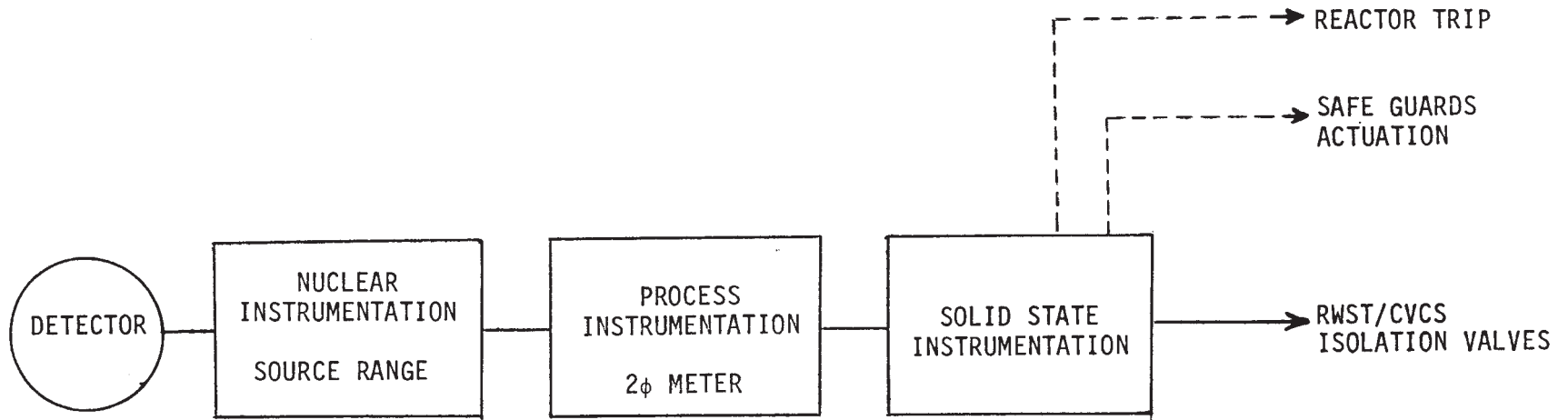
Amendment 67  
February 5, 1988

COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

PRESSURIZER PORV  
LOW TEMPERATURE OVERPRESSURE  
CONTROL LOGIC

FIGURE T.6-5

CPSSES/FSAR

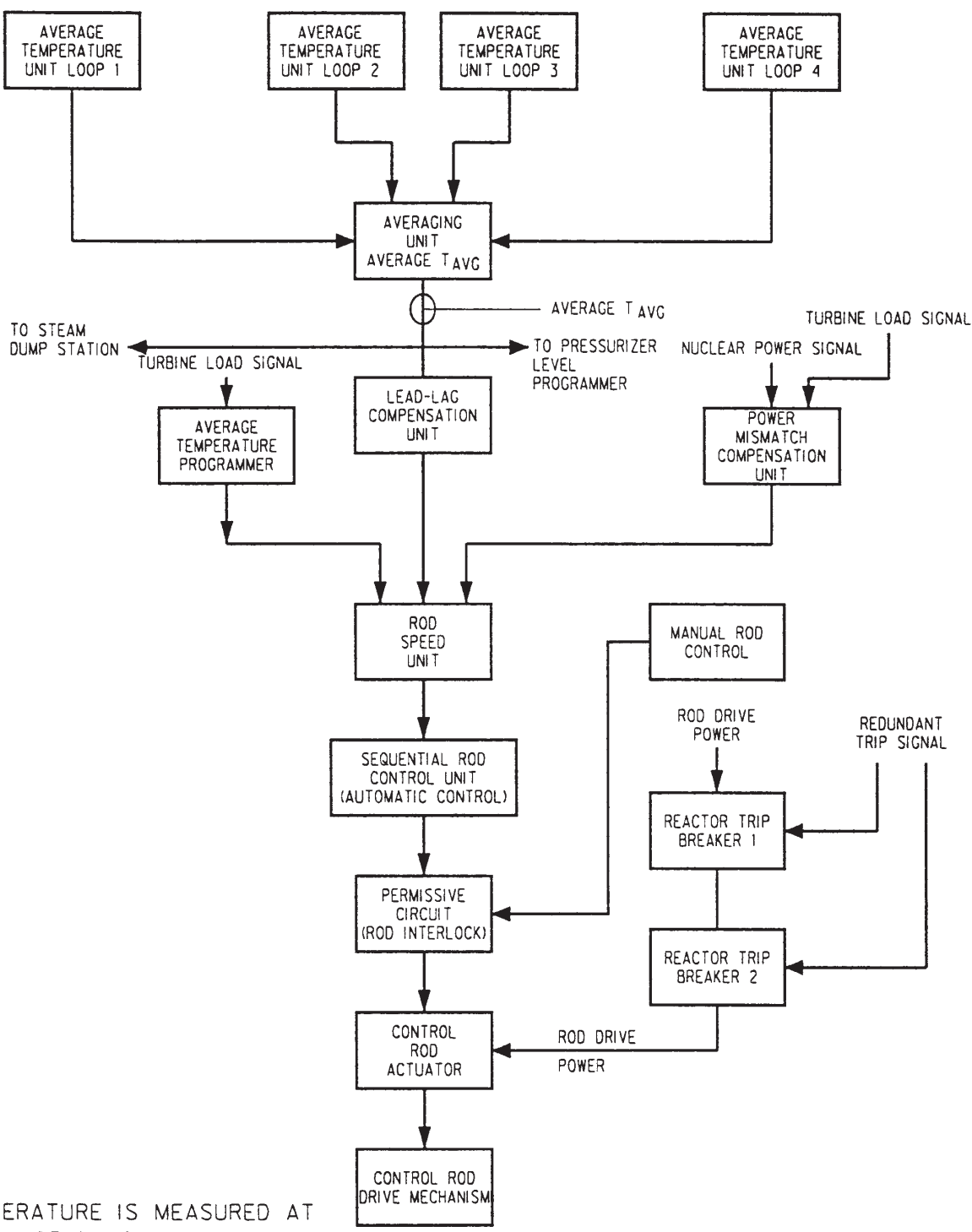


AMENDMENT 15  
FEBRUARY 20, 1981

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

INSTRUMENTATION FOR PROTECTION  
AGAINST INADVERTENT BORON  
DILUTION

FIGURE 7.6-6

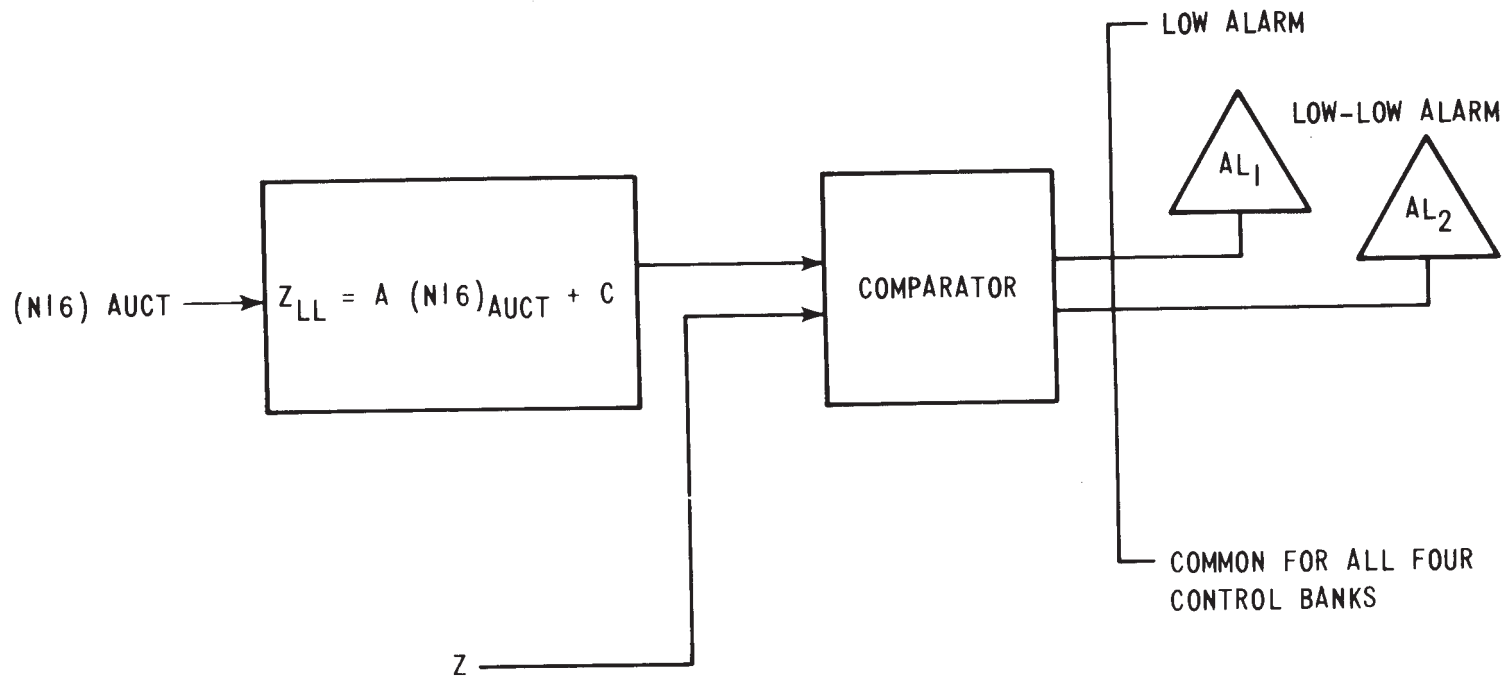


NOTES:

1. TEMPERATURE IS MEASURED AT STEAM GENERATOR'S OUTLET.
2. PRESSURE IS MEASURED AT THE PRESSURIZER.
3. T<sub>AVG</sub> DETERMINED AS SHOWN IN FIG 7.7-18.

Amendment 96  
August 2, 1999

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
<b>SIMPLIFIED BLOCK DIAGRAM OF REACTOR CONTROL SYSTEM</b>
FIGURE 7.7-1



DEMAND BANK  
SIGNAL

TYPICAL OF ONE CONTROL BANK

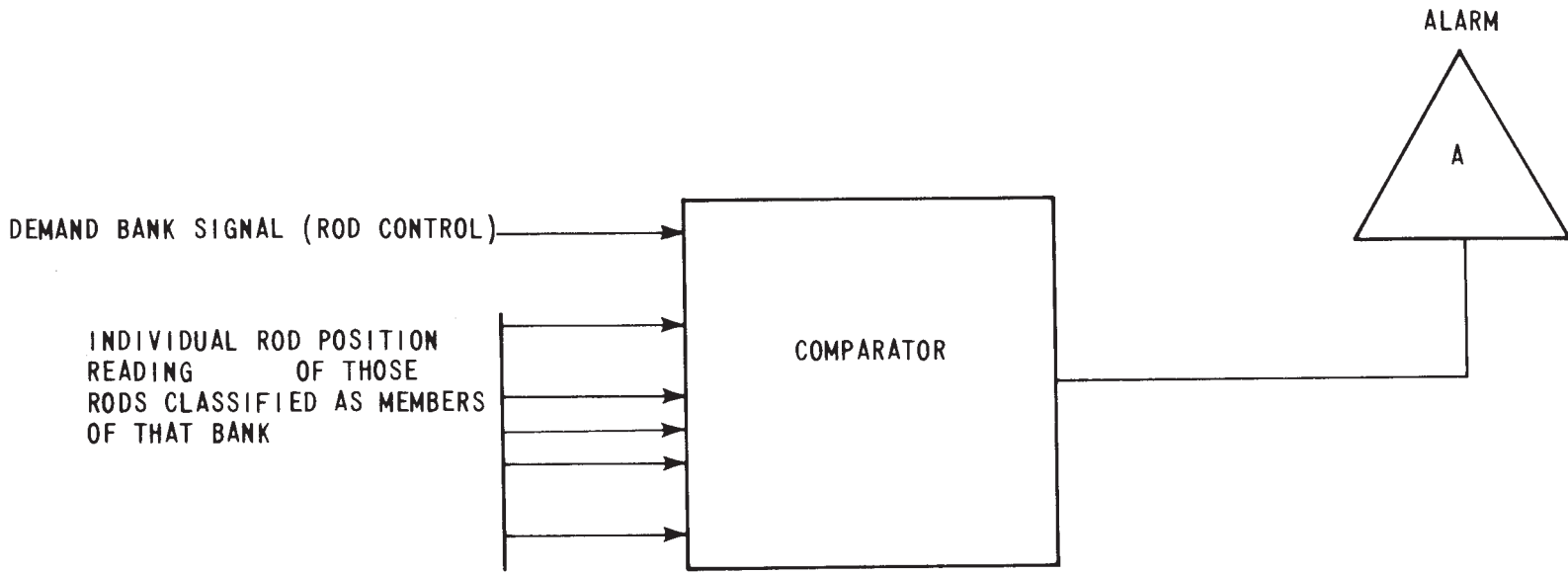
NOVEMBER 30, 1979

- NOTE: 1. ANALOG CIRCUITRY IS USED FOR THE COMPARATOR NETWORK  
2. COMPARISON IS DONE FOR ALL CONTROL BANKS

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Control Bank Rod  
Insertion Monitor

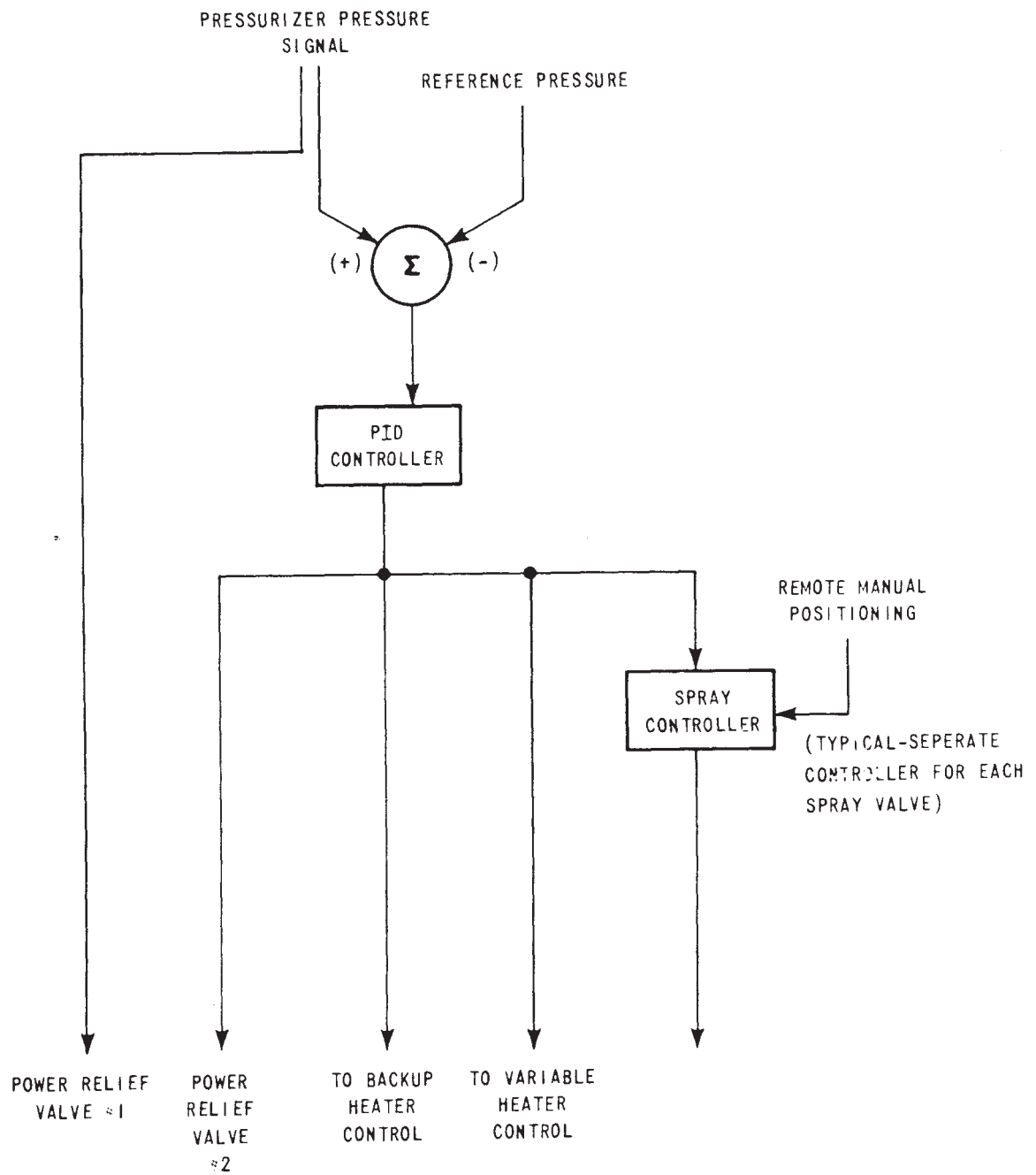
FIGURE 7.7-2



- NOTE:
1. DIGITAL OR ANALOG SIGNALS MAY BE USED FOR THE COMPARATOR COMPUTER INPUTS.
  2. THE COMPARATOR WILL ENERGIZE THE ALARM IF THERE EXISTS A POSITION DIFFERENCE GREATER THAN A PRESET LIMIT BETWEEN ANY INDIVIDUAL ROD POSITION SIGNAL DEVIATES FROM THE OTHER RODS IN THE BANK SIGNAL.
  3. COMPARISON IS INDIVIDUALLY DONE FOR ALL CONTROL BANKS.

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
Rod Deviation Comparator
FIGURE 7.7-3





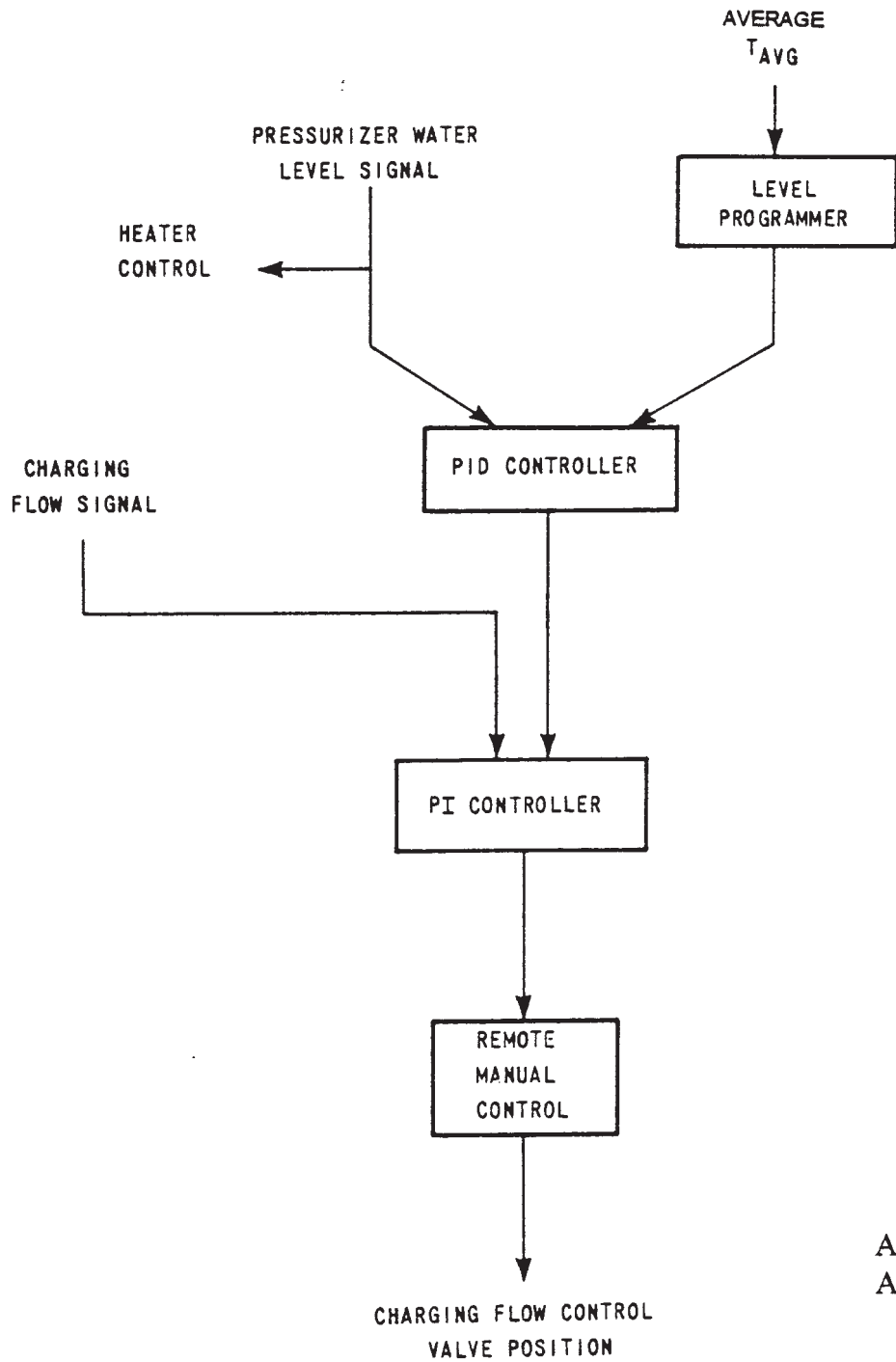
COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2

---

Block Diagram of Pressurizer  
 Pressure Control System

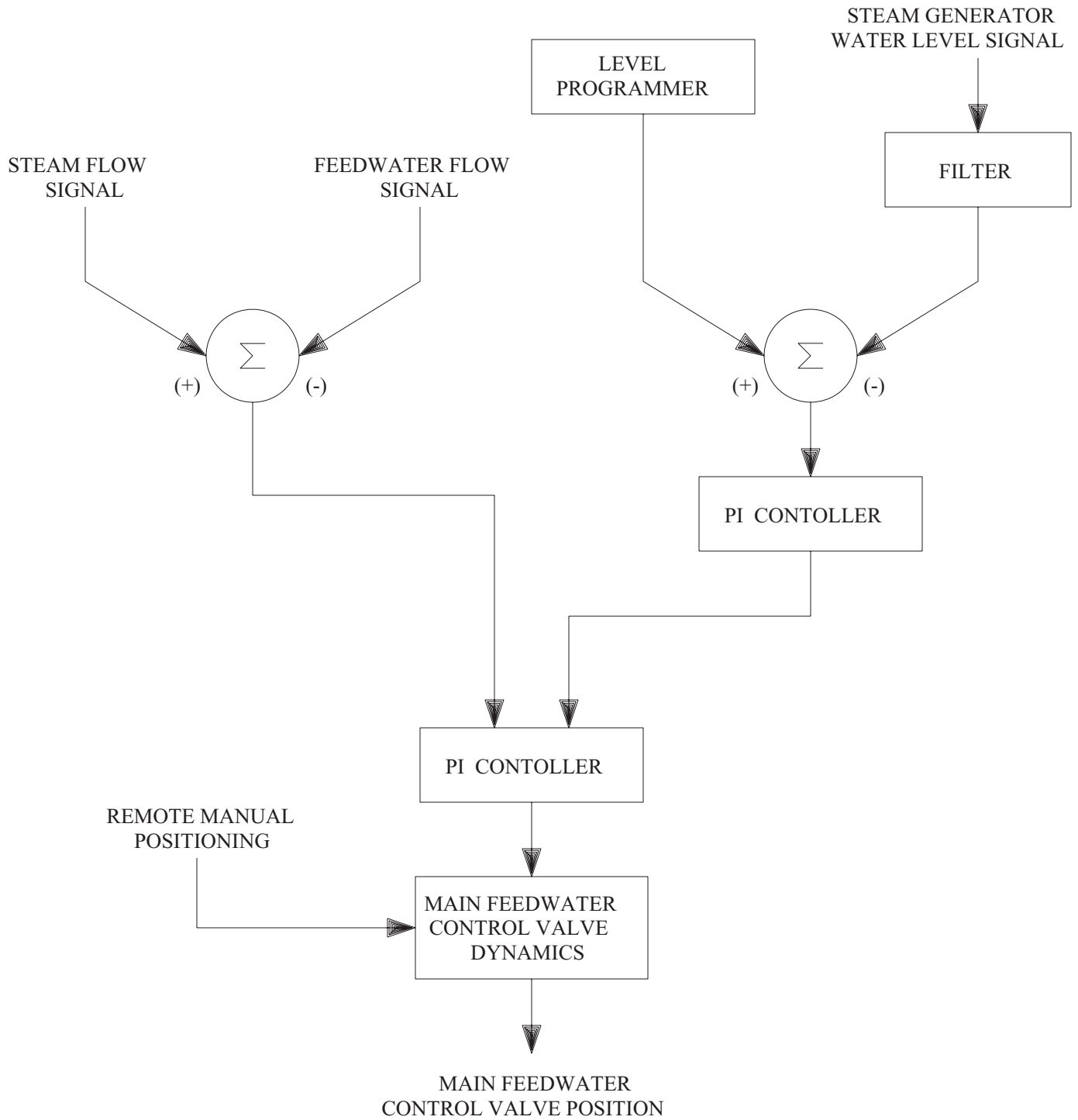
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FIGURE 7.7-4

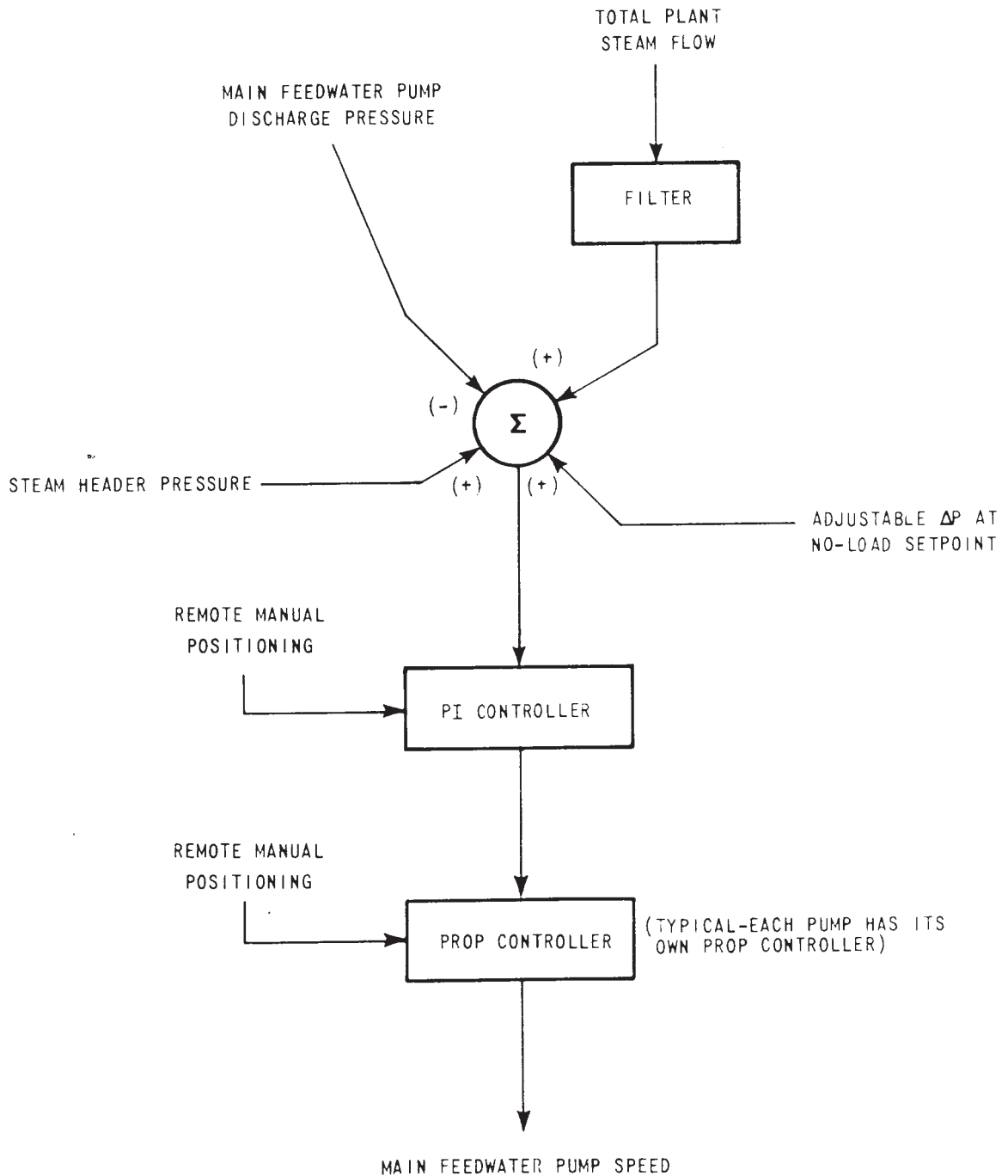


Amendment 96  
August 2, 1999

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
Block Diagram of Pressurizer Water Level Control System
FIGURE 7.7-5



COMANCHE PEAK S E S  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2  
BLOCK DIAGRAM OF STEAM  
GENERATOR WATER LEVEL  
CONTROL SYSTEM  
FIGURE 7.7-6



<p>COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2</p>
<p>Block Diagram of Main Feedwater Pump Speed Control System</p>
<p>FIGURE 7.7-7</p>

STEAM DUMP CONTROL IN MANUAL  
(STEAM PRESSURE CONTROL)

TURBINE IMPULSE  
STAGE PRESSURE

RATE/LAG  
COMPENSATION

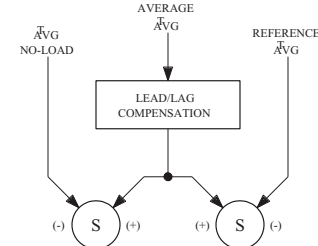
LOAD REJECTION  
BISTABLE

REACTOR  
TRIP  
P-4

DEFEAT LOAD REJECTION  
STEAM DUMP CONTROL:  
ALLOW PLANT TRIP STEAM  
DUMP CONTROL

PLANT TRIP  
CONTROLLER

LOAD REJECTION  
CONTROLLER



STEAM  
HEADER  
PRESSURE

SET  
PRESSURE

S (-)

PI CONTROLLER

LOAD REJECTION  
CONTROL OR PLANT  
TRIP CONTROL

MANUAL  
(STEAM  
PRESSURE  
CONTROL)

AUTO  
( $\bar{A}^2$  AVG  
CONTROL)

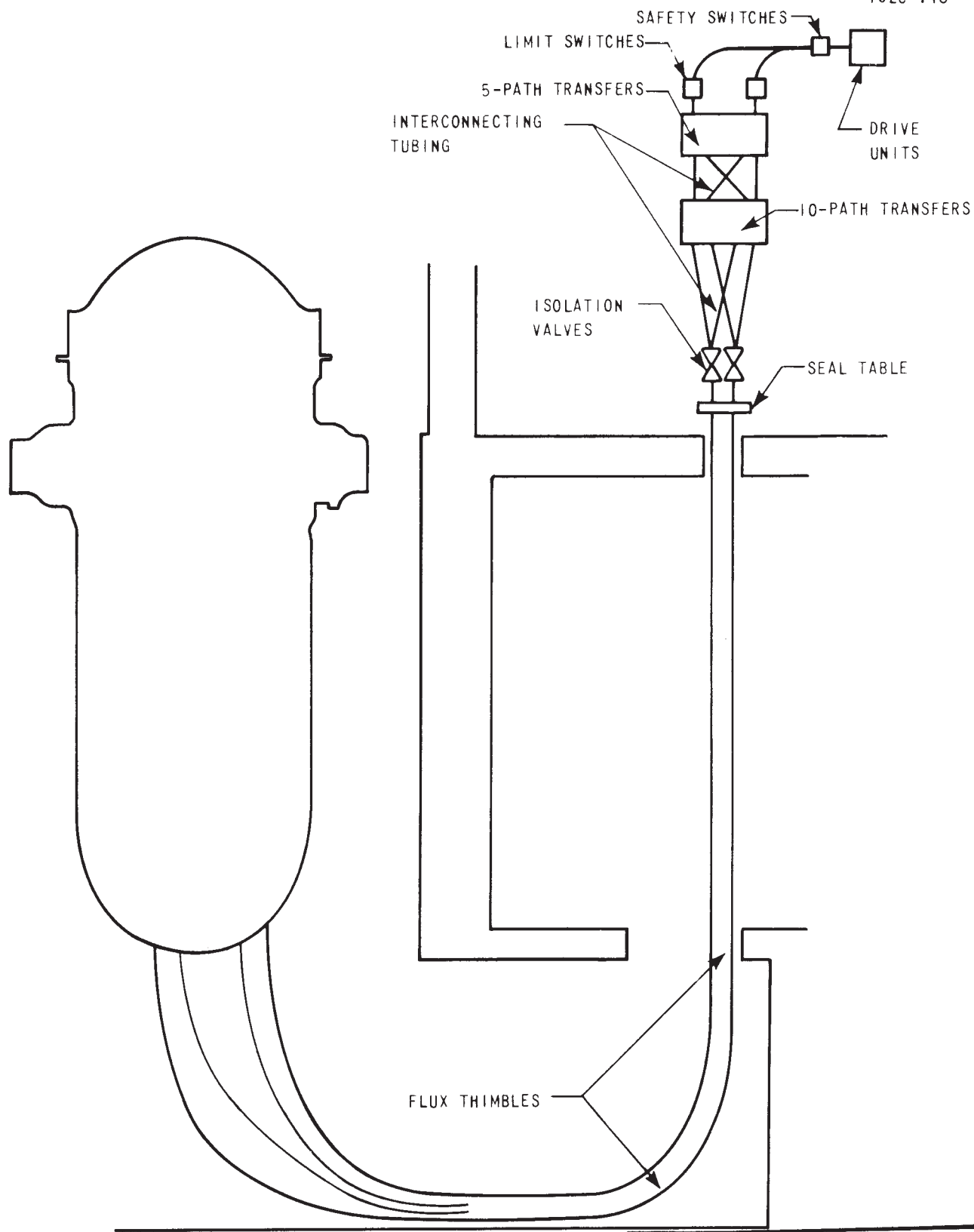
MODULATE CONDENSER  
DUMP VALVES

TRIP OPEN STEAM DUMP VALVES

AIR SUPPLY TO  
DUMP VALVES

- NOTES:
- FOR BLOCKING.  
UNBLOCKING SIGNAL TO  
CONDENSER STEAM  
DUMP VALVES  
SEE FIGURE 7.2-1 SH 10

FIGURE GENERATED FOR FSAR ONLY  
BASED ON DRAWING  
47D05 SH 01  
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2  
BLOCK DIAGRAM OF STEAM  
DUMP CONTROL SYSTEM  
FIGURE 7.7-8 SH 01



COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Basic Flux-Mapping System

FIGURE 7.7-9

CPSES/FSAR

FIGURE 7.7-10

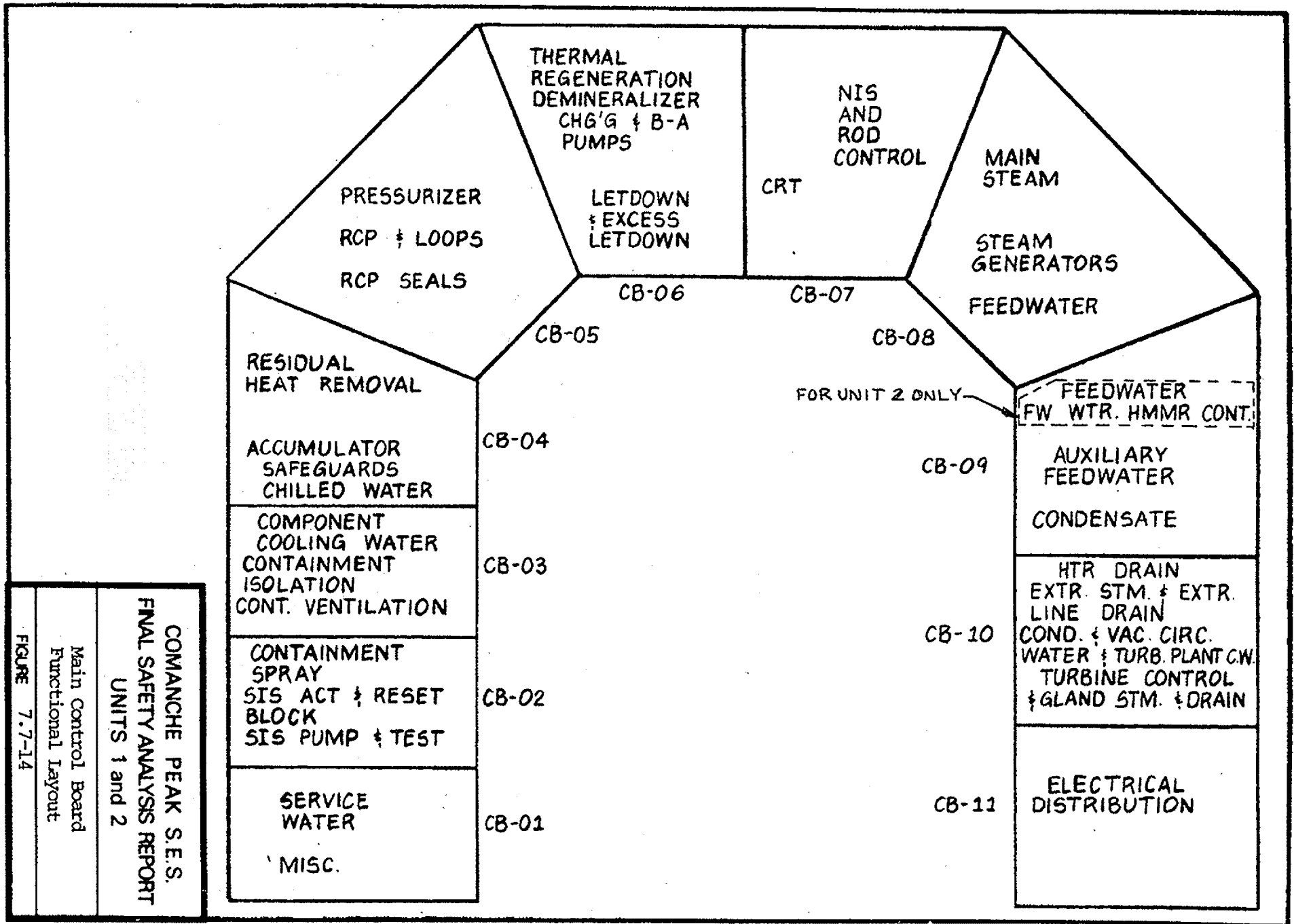
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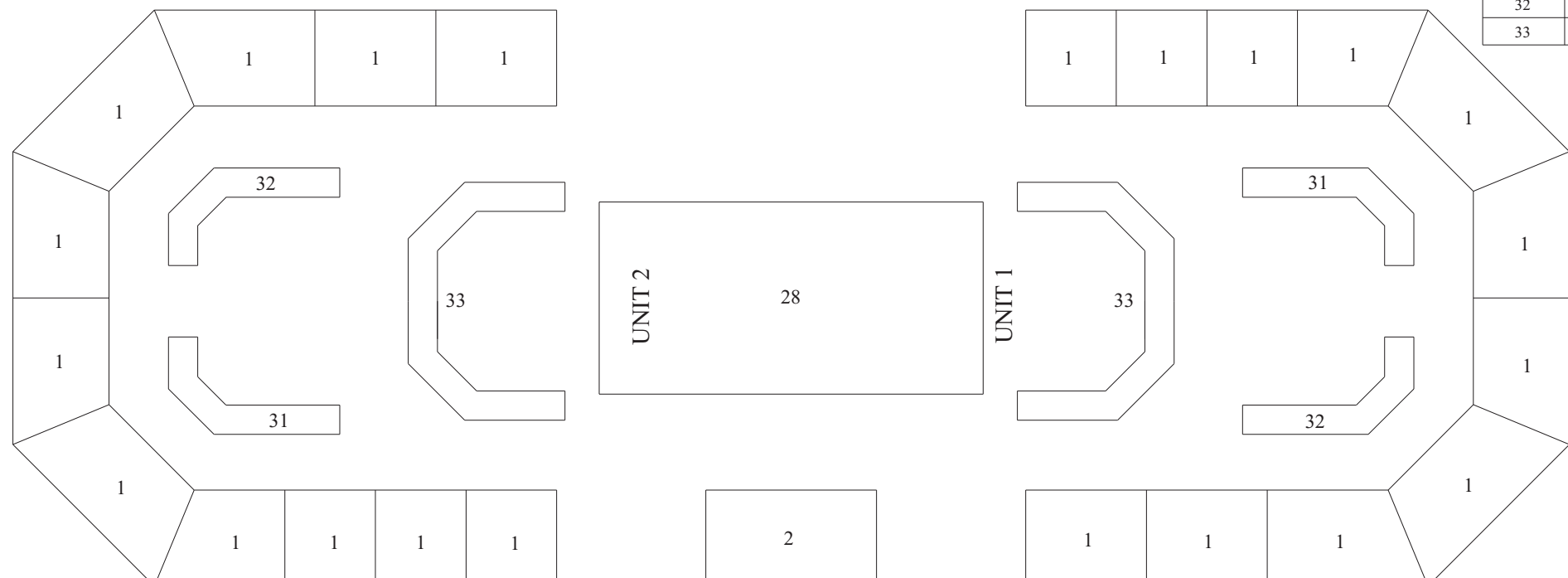
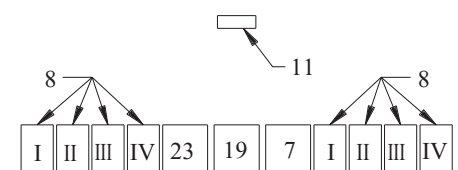
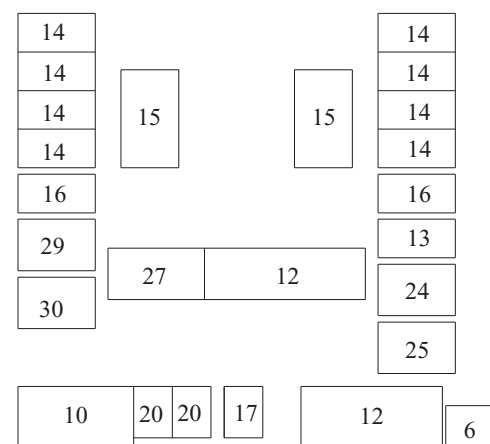
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PANEL	SERVICE	SAFETY RELATED		NOTES
		IEEE 344	IEEE 323	
1	MAIN CONTROL BOARDS	YES	YES	SEE FIGURE 7.7-14
2	SWITCHYARD CONSOLE	NO	NO	
4	INTENTIONALLY LEFT BLANK	N/A	N/A	
6	METEOROLOGICAL PANEL	NO	NO	COMMON FOR UNITS 1 & 2
7	RMS EQUIPMENT RACK (SEISMIC)	YES	NO	COMMON FOR UNITS 1 & 2
8	NUCLEAR INSTR SYS (NIS) RACKS	YES	YES	
10	FIRE DETECTION SYSTEM PANEL	YES	NO	COMMON FOR UNITS 1 & 2
11	MCC STATUS LIGHT PNL	YES	YES	COMMON FOR UNITS 1 & 2
12	HVAC VERT PANEL	YES	YES	COMMON FOR UNITS 1 & 2
13	SEISMIC INSTR SYSTEM PANEL	YES	NO	COMMON FOR UNITS 1 & 2
14	MOVABLE INCORE FLUX MONITORING PANEL	NO	NO	
15	RECORDER PANEL	NO	NO	
16	LOOSE PARTS MONITORING SYS PANEL	NO	NO	
17	RAD MONITORING SYSTEM (RMS) PRINTERS	NO	NO	
19	RMS EQUIPMENT RACK (1E)	YES	YES	COMMON FOR UNITS 1 & 2
20	RMS EQUIPMENT	NO	NO	COMMON FOR UNITS 1 & 2
23	LEADING EDGE FLOW METER	NO	NO	COMMON FOR UNITS 1 & 2
24	H2 ANALYZER & CORE EXIT T/C (TRAIN A)	YES	YES	NOTE 1
25	H2 ANALYZER & CORE EXIT T/C (TRAIN B)	YES	YES	NOTE 1
27	HVAC VERT PANEL	YES	YES	UNIT 2 ONLY
28	CENTRAL WORK STATION	NO	NO	
29	CORE EXIT T/C (TRAIN A)	YES	YES	UNIT 2 ONLY
30	CORE EXIT T/C (TRAIN B)	YES	YES	UNIT 2 ONLY
31	OPERATOR CONSOLE A	NO	NO	INCLUDES RMS REMOTE VIEW NODE AND PROCESS COMPUTER
32	OPERATOR CONSOLE B	NO	NO	
33	SUPERVISOR CONSOLE C	NO	NO	

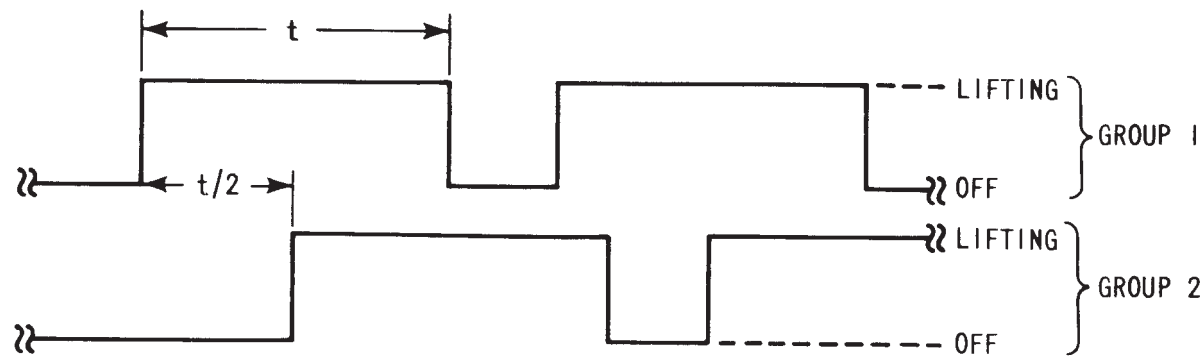
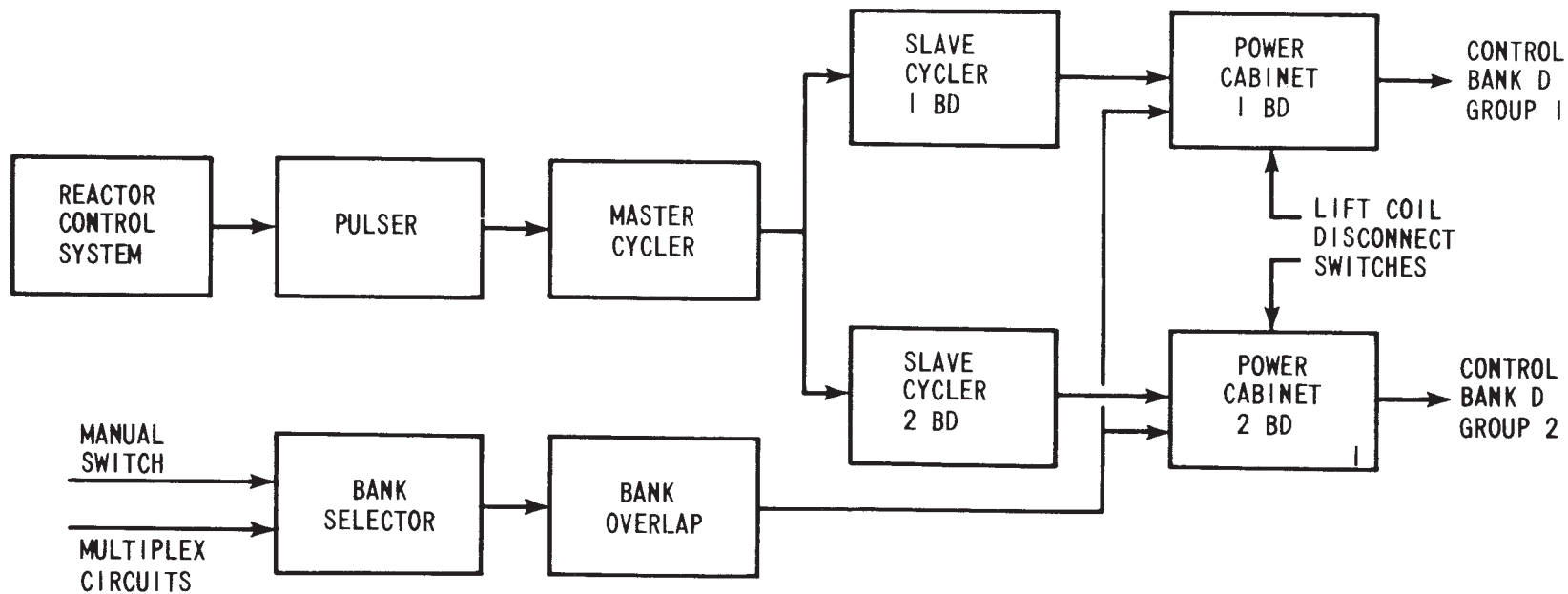
NOTES:  
 1. PANELS 24 AND 25 CONTAIN UNIT 1 CORE EXIT T/C'S AND AN H2 ANALYZER COMMON FOR BOTH UNIT 1 AND UNIT 2.

**AMENDMENT 76**

COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2

**CONTROL ROOM  
 PANEL ARRANGEMENT**

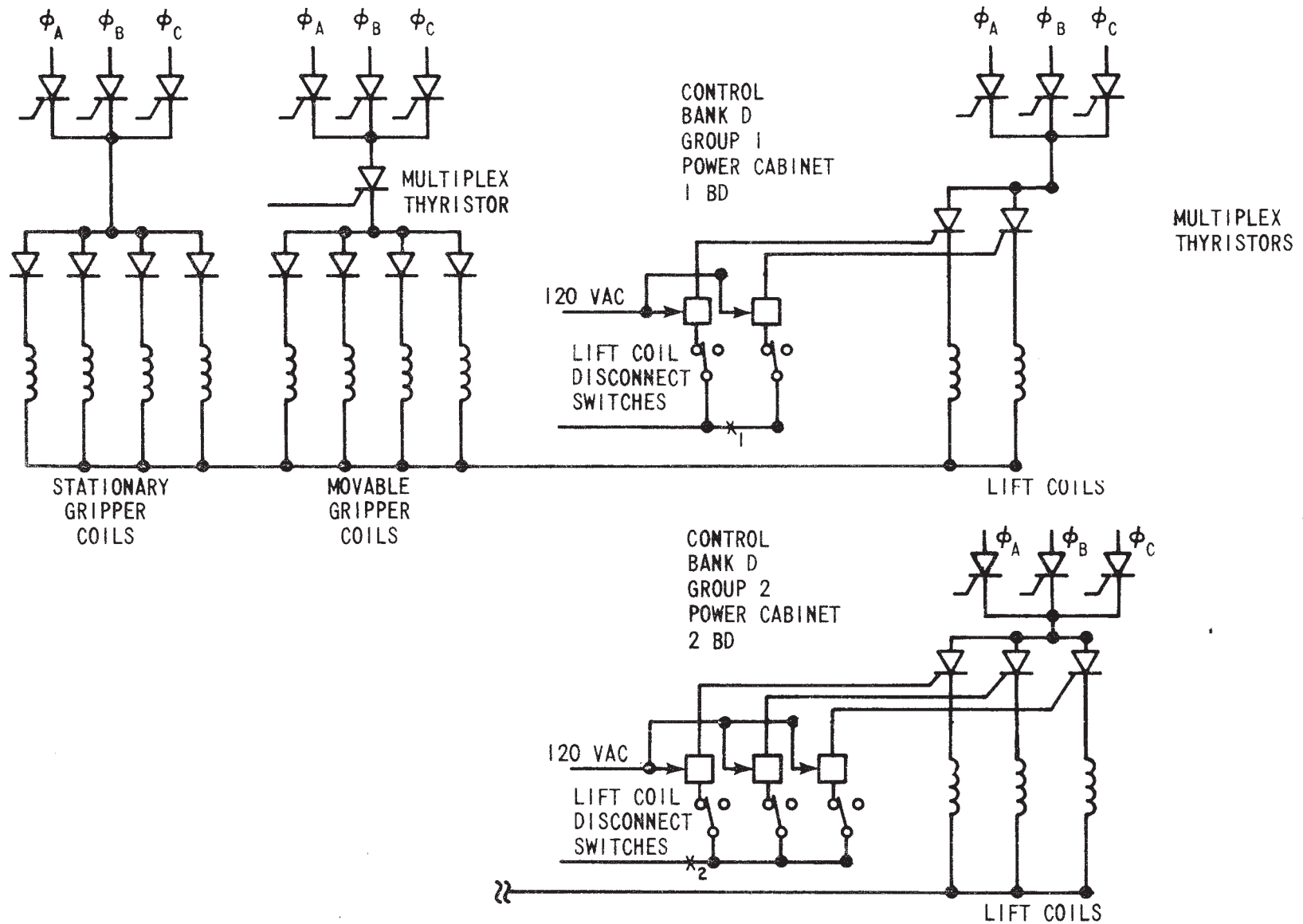
FIGURE 7.7-14A



NORMAL SEQUENCING OF GROUPS WITHIN BANK

1 NOTE: ONLY CABINETS 1BD AND 2BD SHOWN. FOR MORE COMPLETE DIAGRAM INCLUDING POWER CABINETS 1AC, 2AC, AND SCD. SEE REF.1

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
Simplified Block Diagram Rod Control System
FIGURE 7.7-15



AMENDMENT 2  
JULY 27, 1978

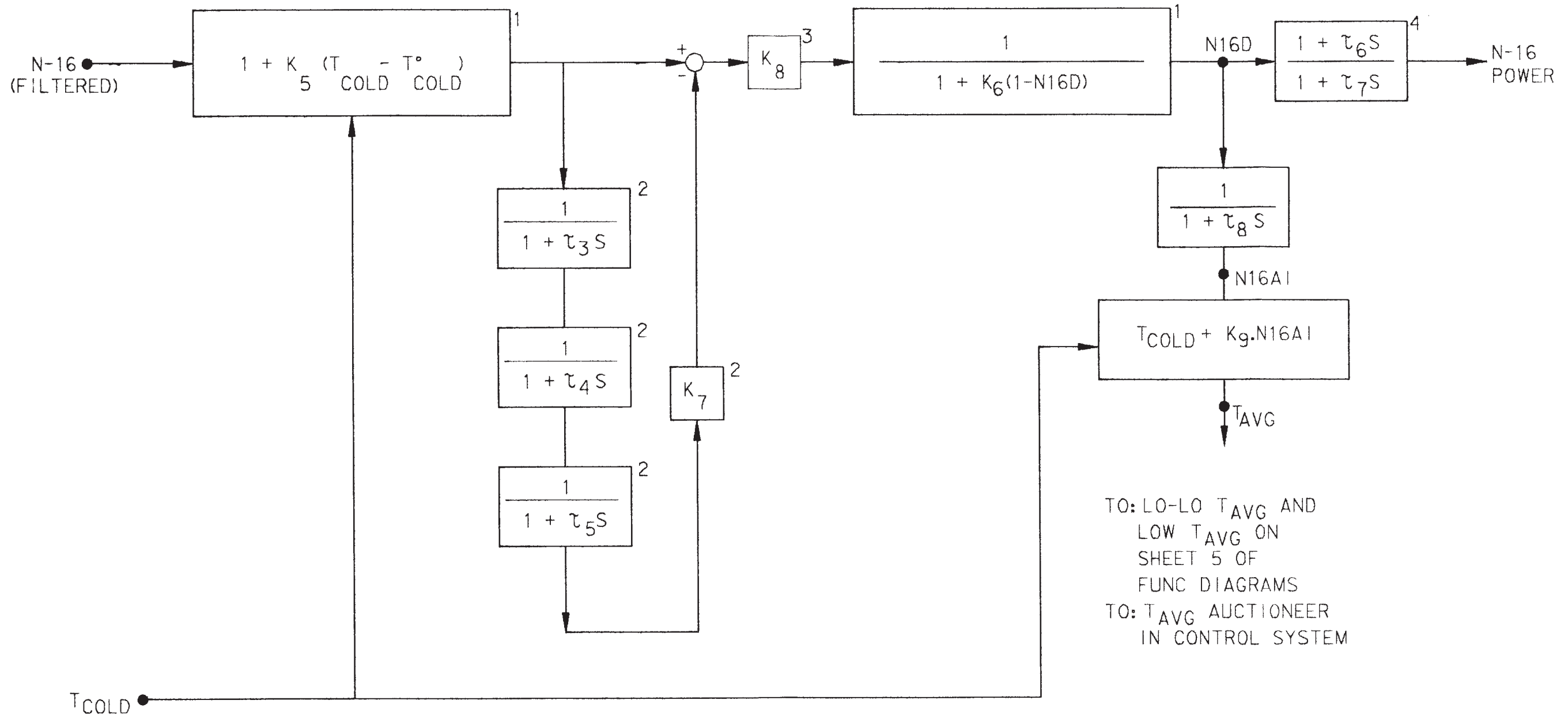
COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

Control Bank D Partial  
Simplified Schematic Diagram  
Power Cabinets 1BD & 2BD

FIGURE 7.7-16

FIGURE 7.7-17

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TO: LO-LO T<sub>AVG</sub> AND  
 LOW T<sub>AVG</sub> ON  
 SHEET 5 OF  
 FUNC DIAGRAMS  
 TO: T<sub>AVG</sub> AUCTIONEER  
 IN CONTROL SYSTEM

- 1. TEMPERATURE COMPENSATION TERM
- 2. BUILD-UP EFFECT COMPENSATION TERM
- 3. CALIBRATION CONSTANT
- 4. LEAD/LAG TERM ACCOUNTS FOR TRANSIT TIME DELAY

COMANCHE PEAK S.E.S.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 AND 2

---

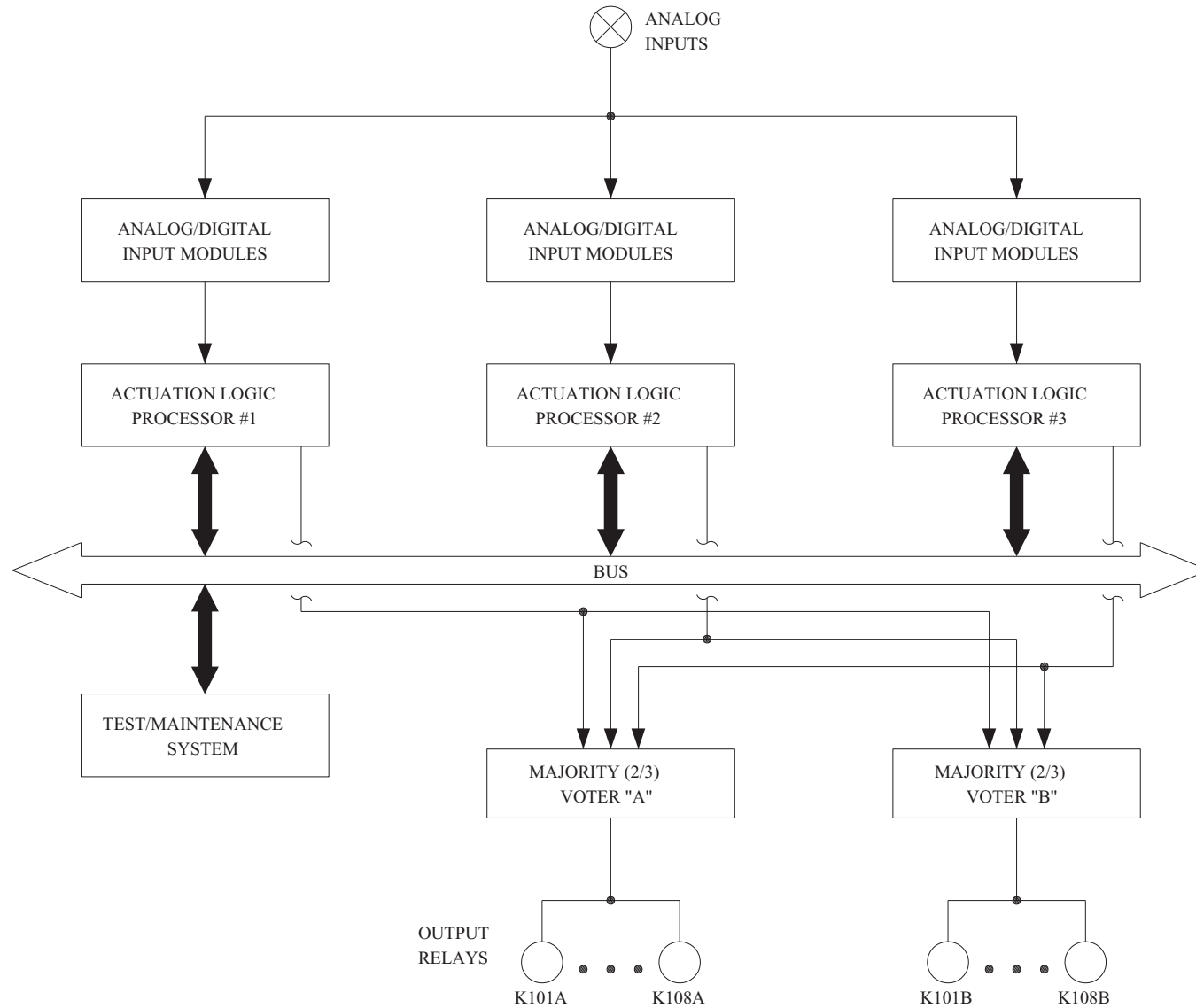
COMPUTATION OF T<sub>AVG</sub> VIA N<sub>16</sub>  
 POWER SYSTEM

---

FIGURE 7.7-18

AMENDMENT 78  
 JANUARY 15, 1990





COMANCHE PEAK S E S  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 AND 2

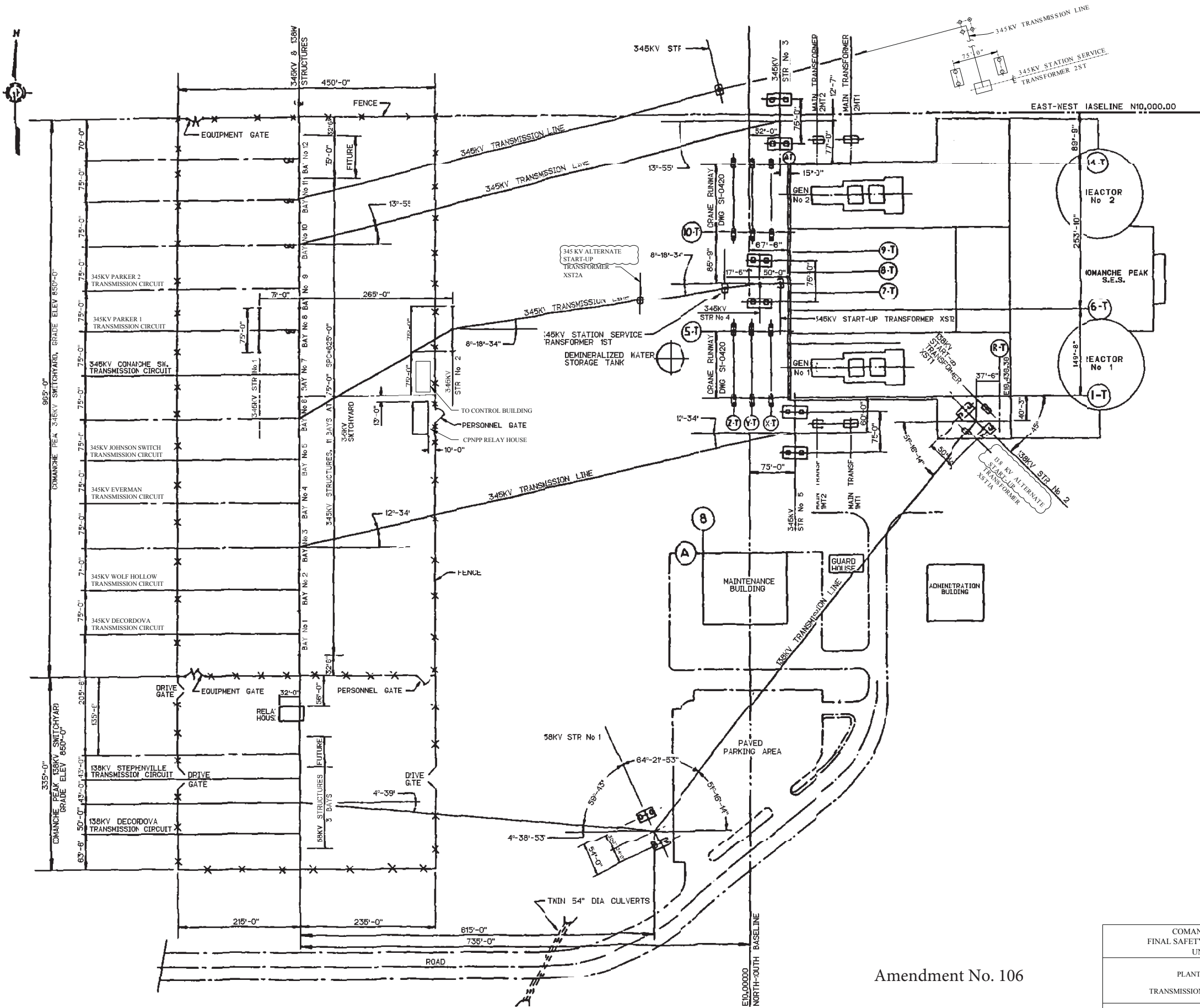
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ACTUATION LOGIC  
 SYSTEM ARCHITECTURE

---

FIGURE 7.8-1

THIS FIGURE GENERATED FOR FSR ONLY. THE ASSOCIATED PROJECT DWG IS 2333-S-0200 REV 6, AND TES DWG E-40782 SH 1

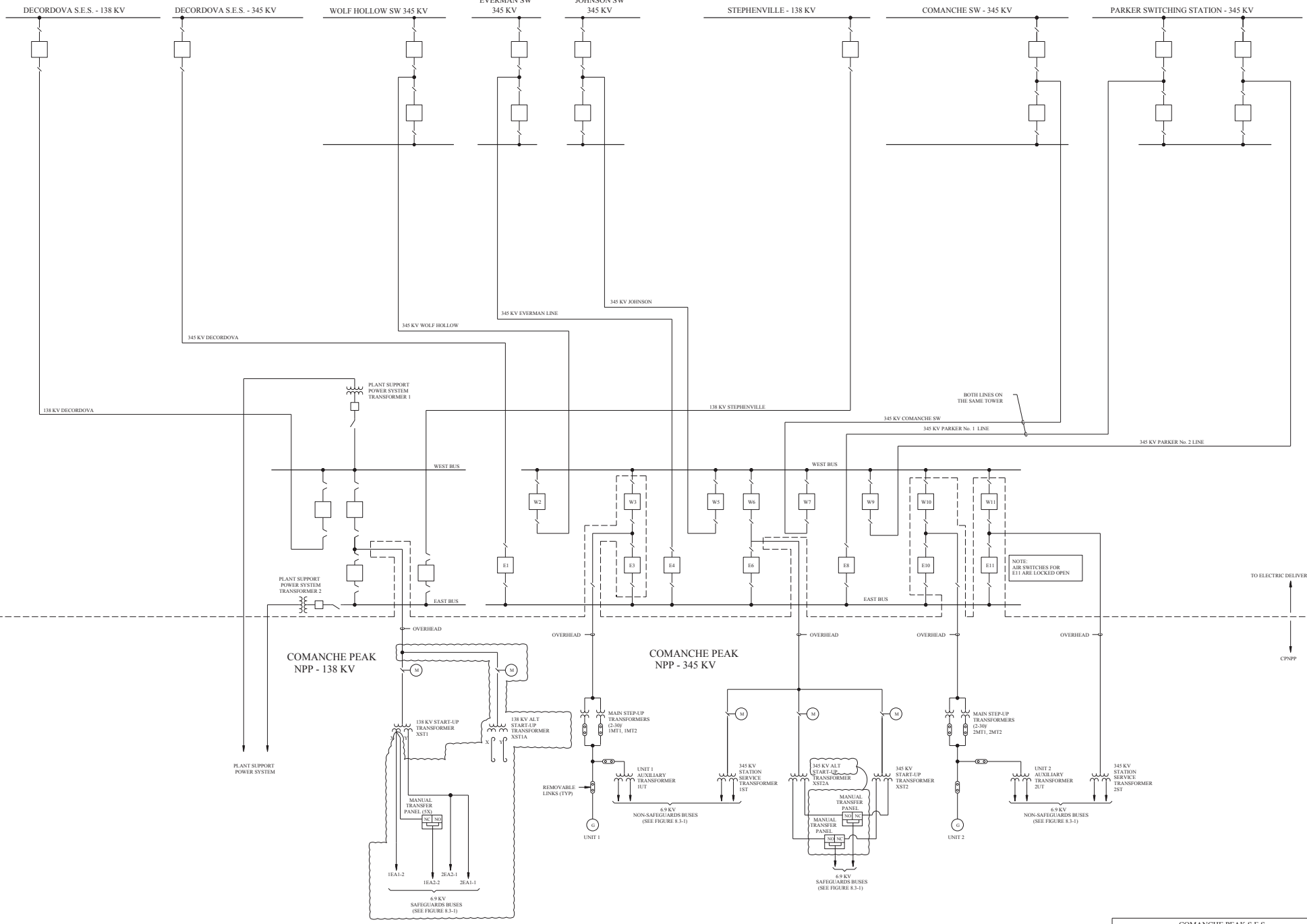


Amendment No. 106

COMANCHE PEAK N.P.P. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
PLANT SWITCHYARDS AND TRANSMISSION LINE CONNECTIONS
FIGURE 8.2-1

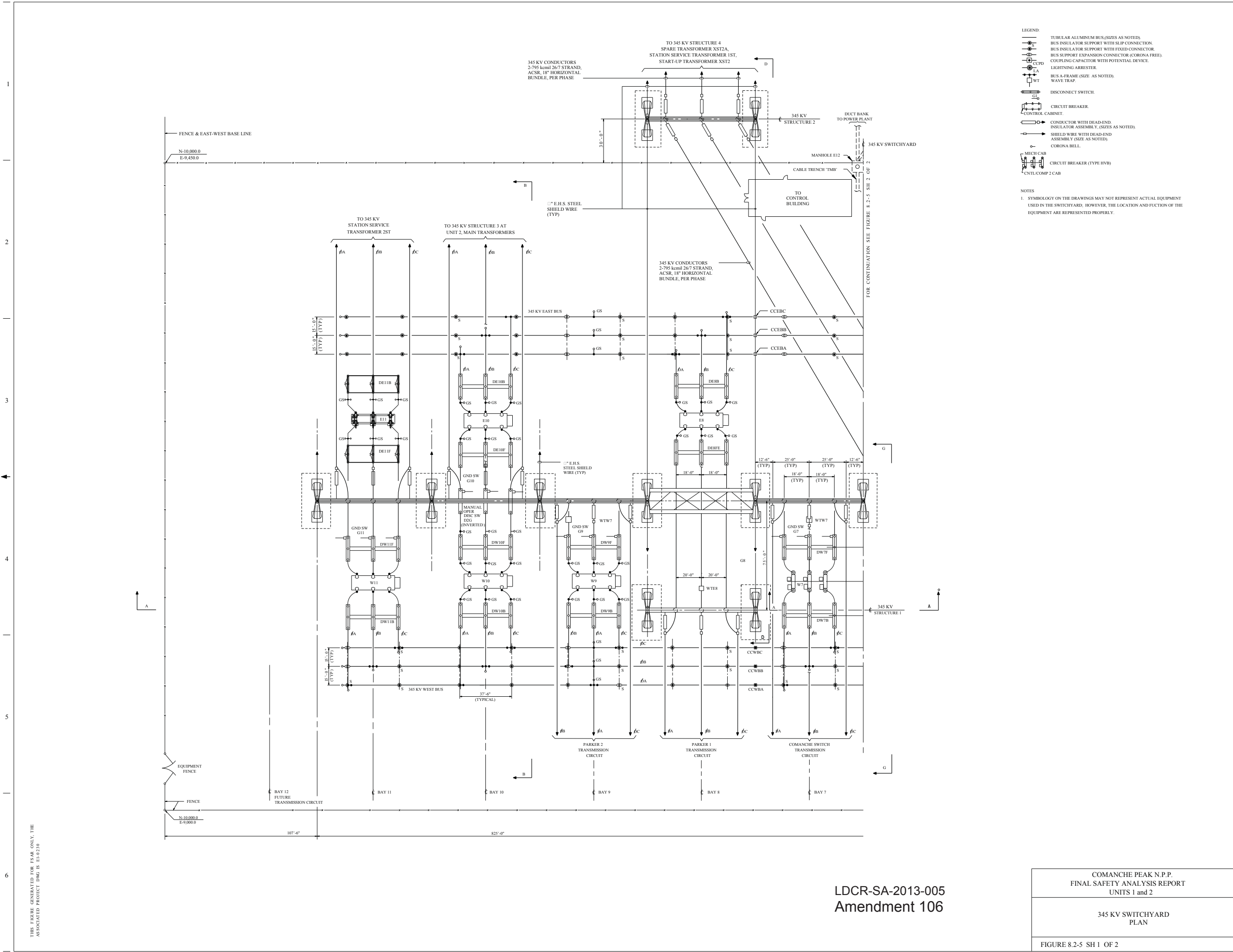
Figure 8.2-2

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Amendment No. 106

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
ELECTRICAL NETWORK INTERCONNECTIONS
FIGURE 8.2-4



- LEGEND:**
- TUBULAR ALUMINUM BUS (SIZES AS NOTED).
  - BUS INSULATOR SUPPORT WITH SLIP CONNECTION.
  - BUS INSULATOR SUPPORT WITH FIXED CONNECTOR.
  - BUS SUPPORT EXPANSION CONNECTOR (CORONA FREE).
  - COUPLING CAPACITOR WITH POTENTIAL DEVICE.
  - LIGHTNING ARRESTER.
  - BUS A-FRAME (SIZE AS NOTED).
  - WAVE TRAP.
  - DISCONNECT SWITCH.
  - CIRCUIT BREAKER.
  - CONTROL CABINET.
  - CONDUCTOR WITH DEAD-END INSULATOR ASSEMBLY (SIZE AS NOTED).
  - SHIELD WIRE WITH DEAD-END ASSEMBLY (SIZE AS NOTED).
  - CORONA BELL.
  - MECH CAB.
  - CIRCUIT BREAKER (TYPE HVB).
  - CNTL. COMP 2 CAB.

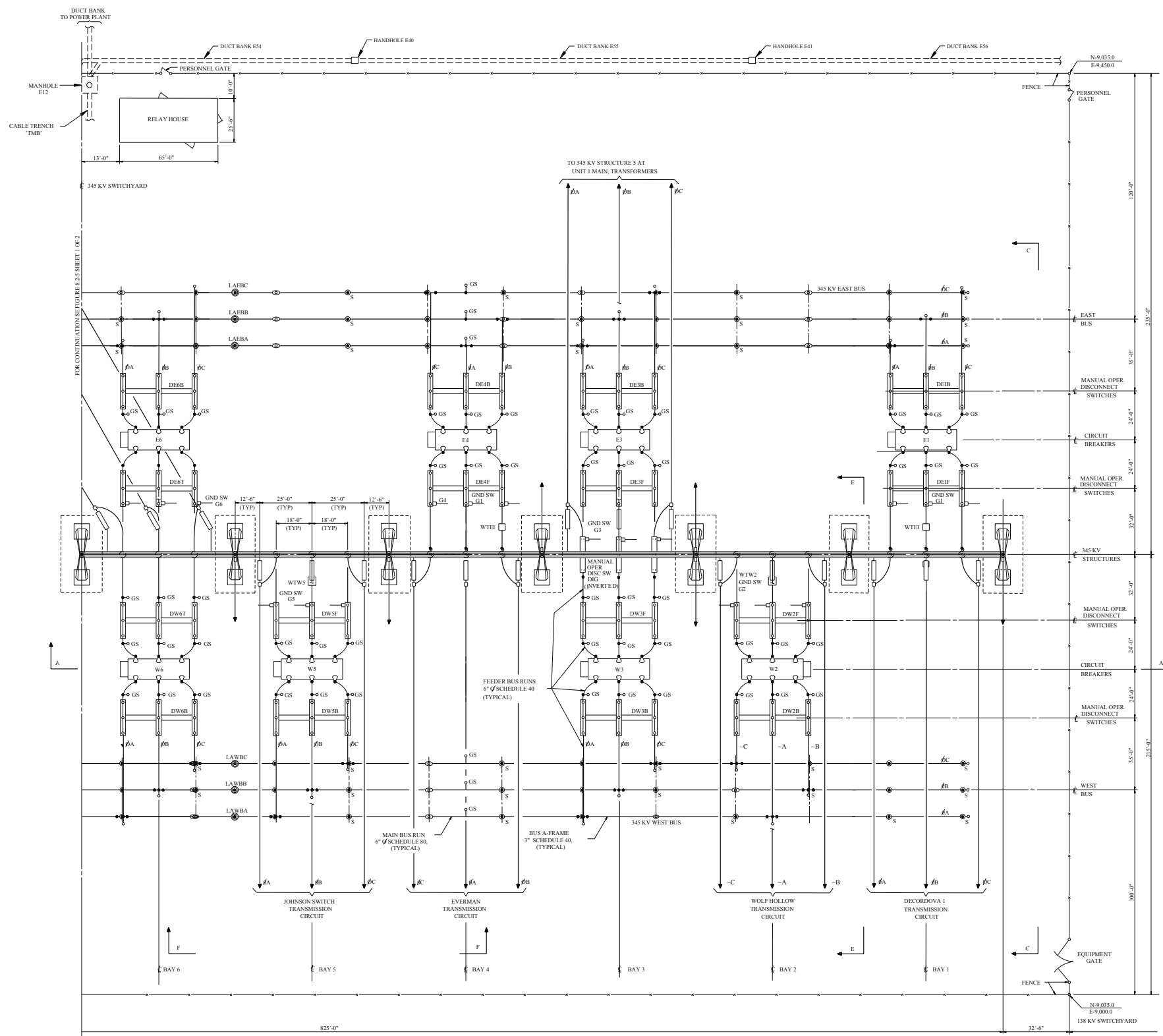
**NOTES**

1. SYMBOLY ON THE DRAWINGS MAY NOT REPRESENT ACTUAL EQUIPMENT USED IN THE SWITCHYARD; HOWEVER, THE LOCATION AND FUNCTION OF THE EQUIPMENT ARE REPRESENTED PROPERLY.

THIS FIGURE GENERATED FOR ESAR ONLY. THE ASSOCIATED PROJECT DWG IS EI-0210

LDCR-SA-2013-005  
Amendment 106

COMANCHE PEAK N.P.P. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2	
345 KV SWITCHYARD PLAN	
FIGURE 8.2-5 SH 1 OF 2	



PLAN

### Amendment 104

FIGURE GENERATED FOR FSAR ONLY  
BASED ON DRAWING  
E1-0230

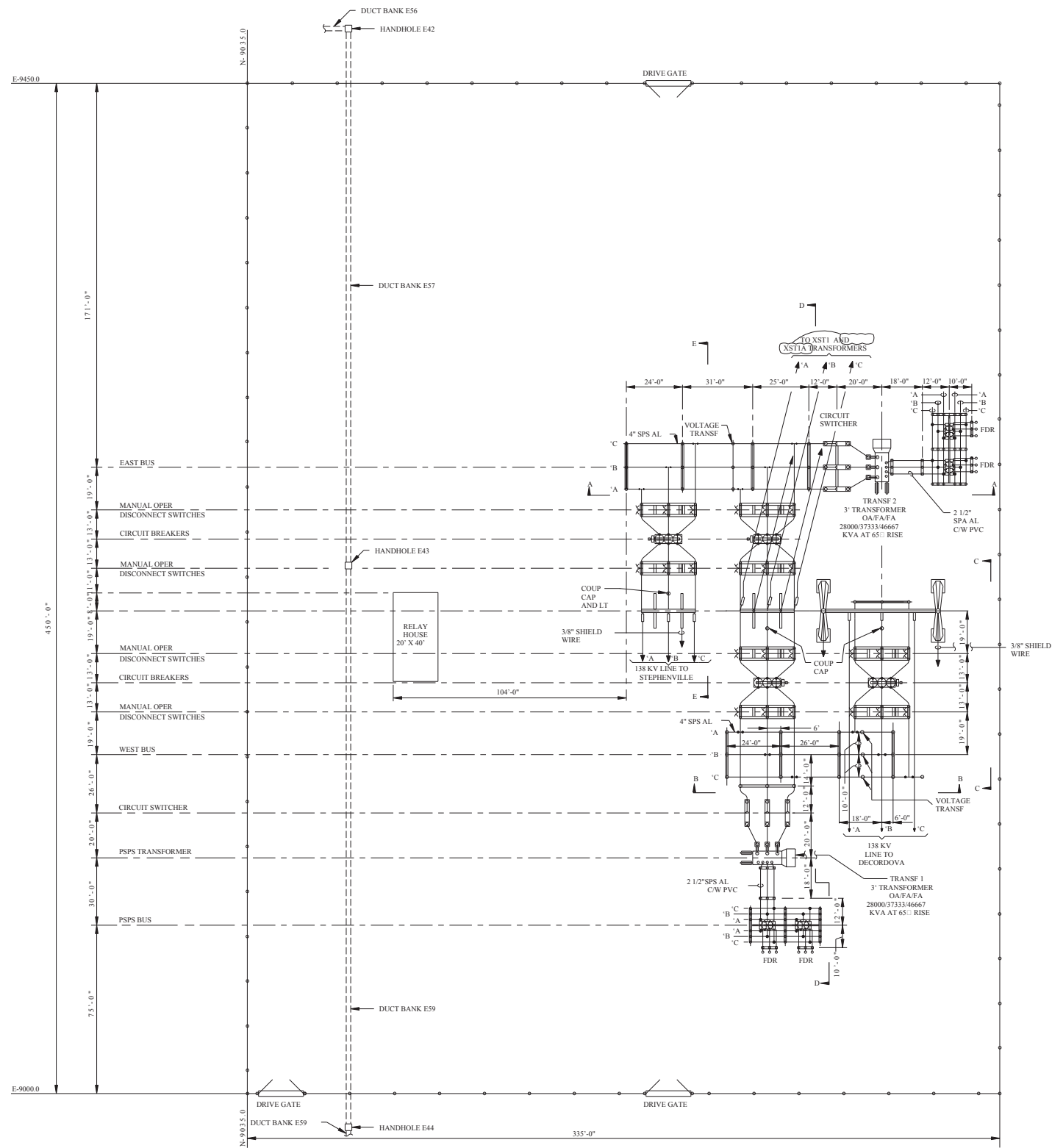
COMANCHE PEAK N.P.P.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 AND 2

345 KV SWITCHYARD  
PLAN

FIGURE 8.2-5 SH 2 OF 2

Figure 8.2-6

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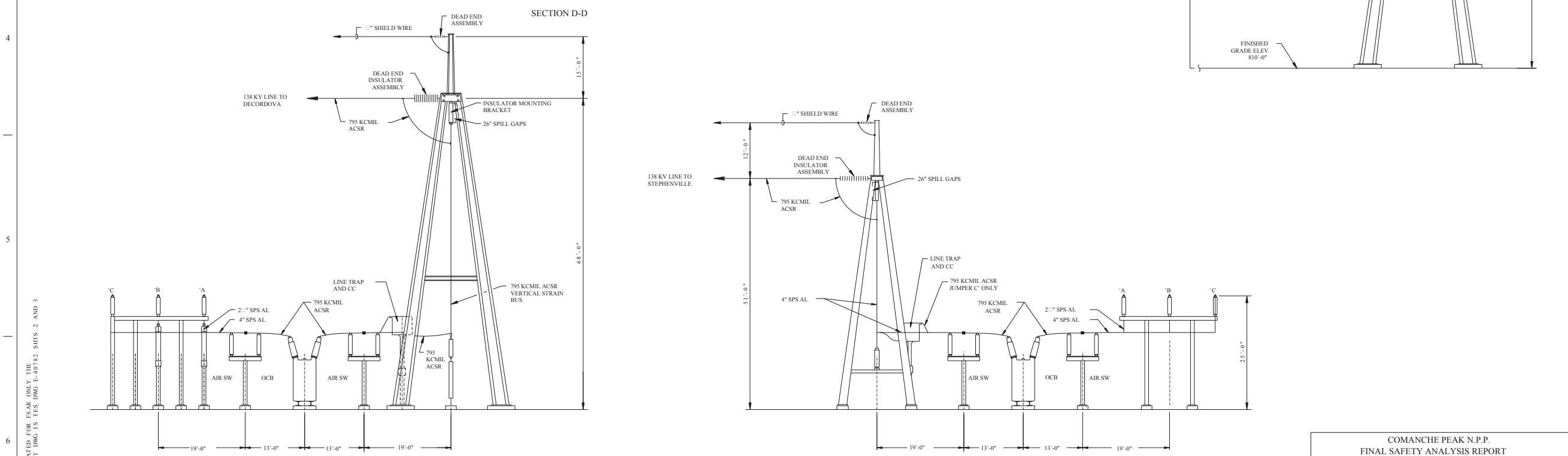
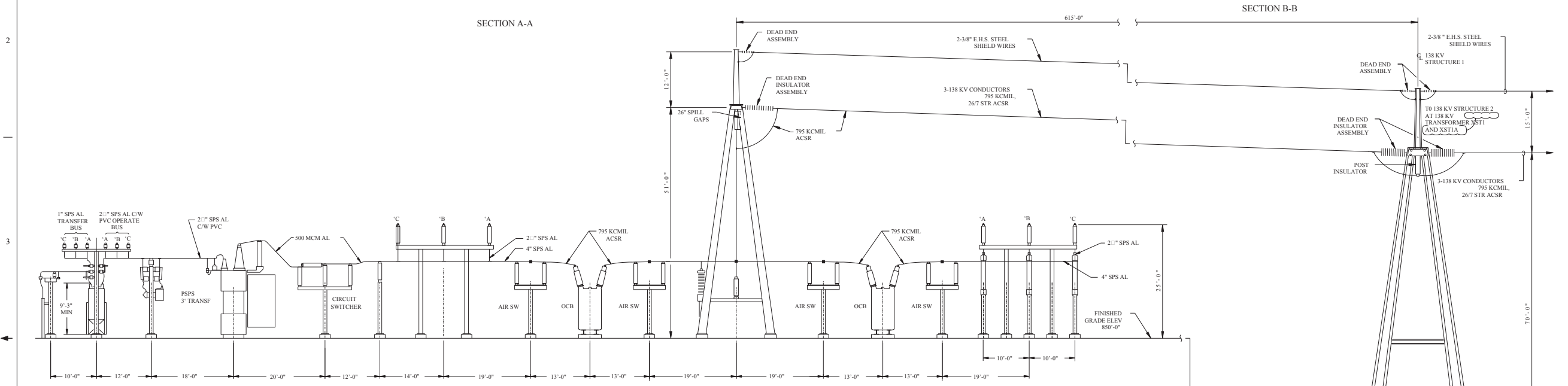
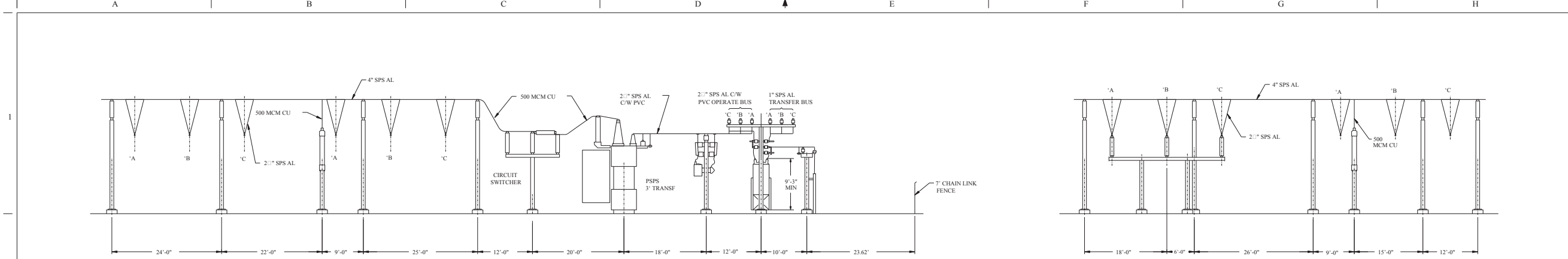
PLAN

Amendment No. 106

COMANCHE PEAK N.P.P. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
138 KV SWITCHYARD PLAN ELEVATIONS, AND SECTIONS
FIGURE 8.2-7 SH 1 OF 2

THIS FIGURE GENERATED FOR FSAR ONLY. THE ASSOCIATED PROJECT DWG IS TES DWG E-40782 SH 1





THIS FIGURE GENERATED FOR FSAR ONLY. THE ASSOCIATED PROJECT DWG IS TES DWG E-40782 SHTS 2 AND 3

COMANCHE PEAK N.P.P. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
138 KV SWITCHYARD PLAN ELEVATIONS, AND SECTIONS
FIGURE 8.2-7 SH 2 OF 2

Amendment No. 106

CPSES/FSAR

UNITS 1 & 2

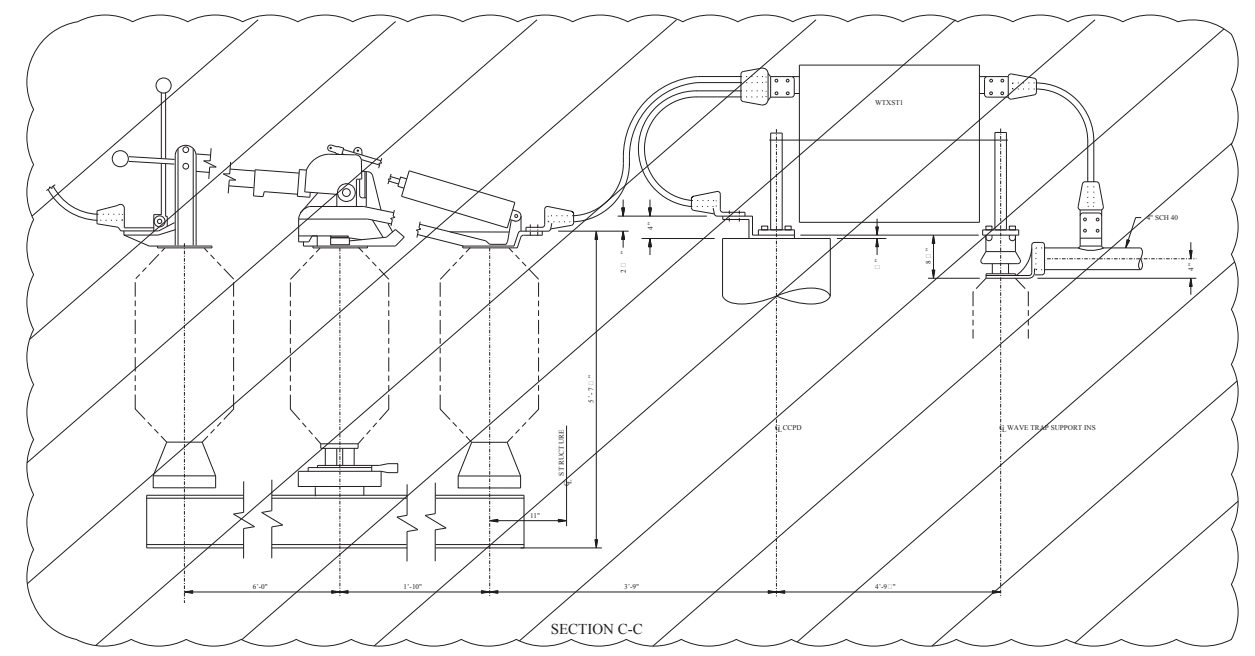
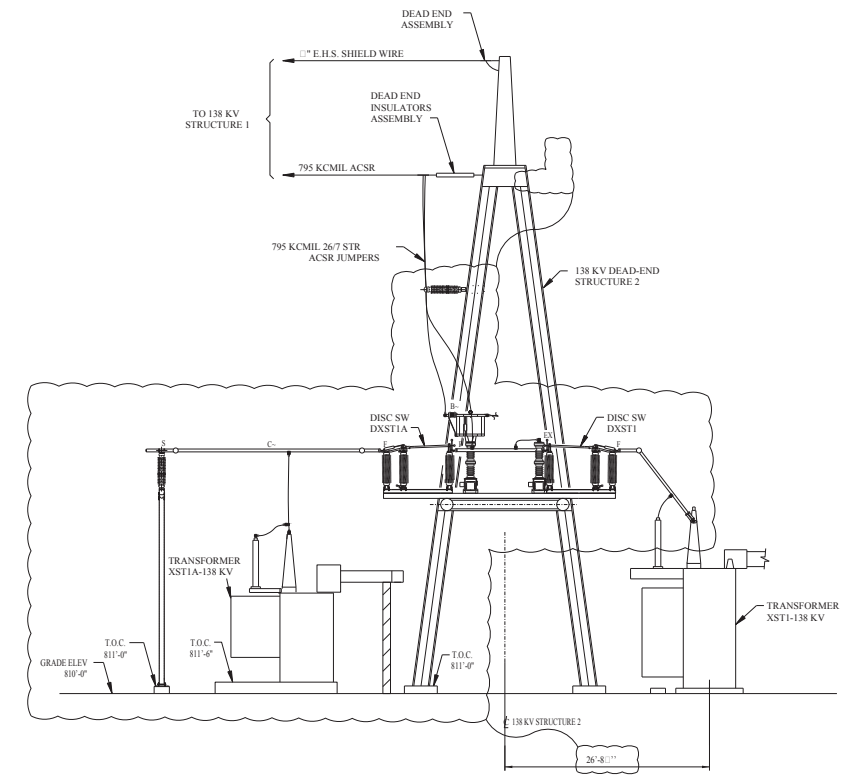
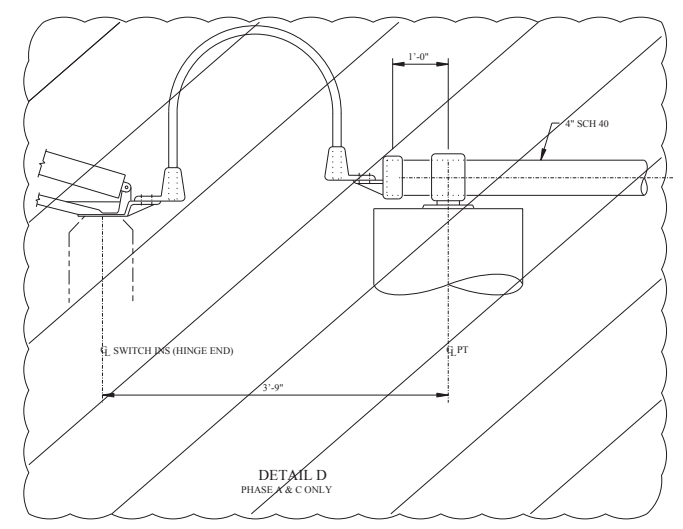
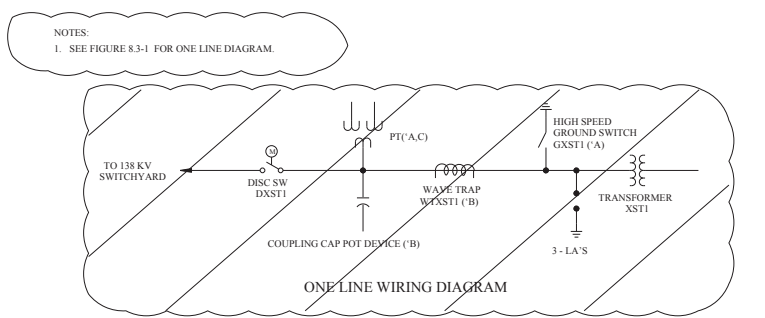
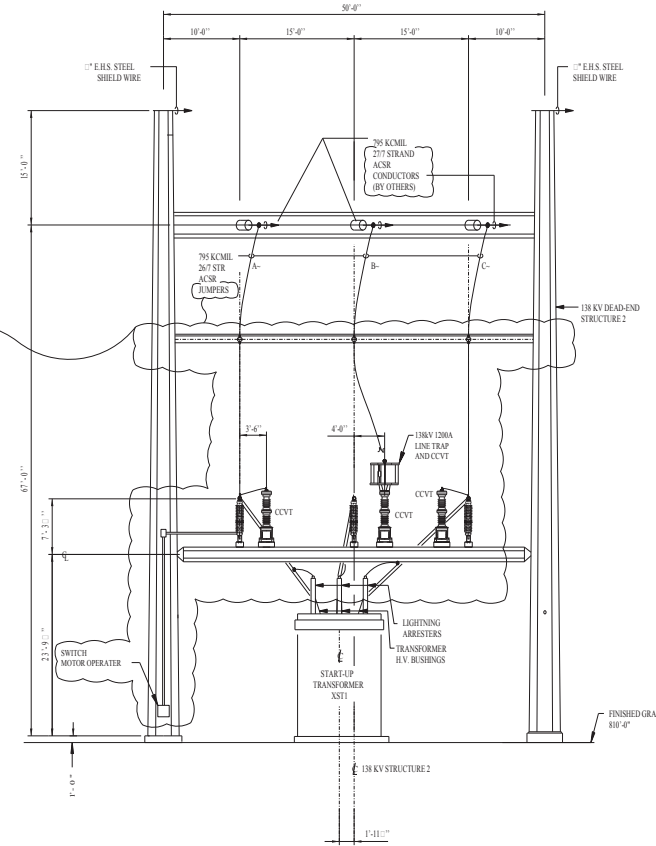
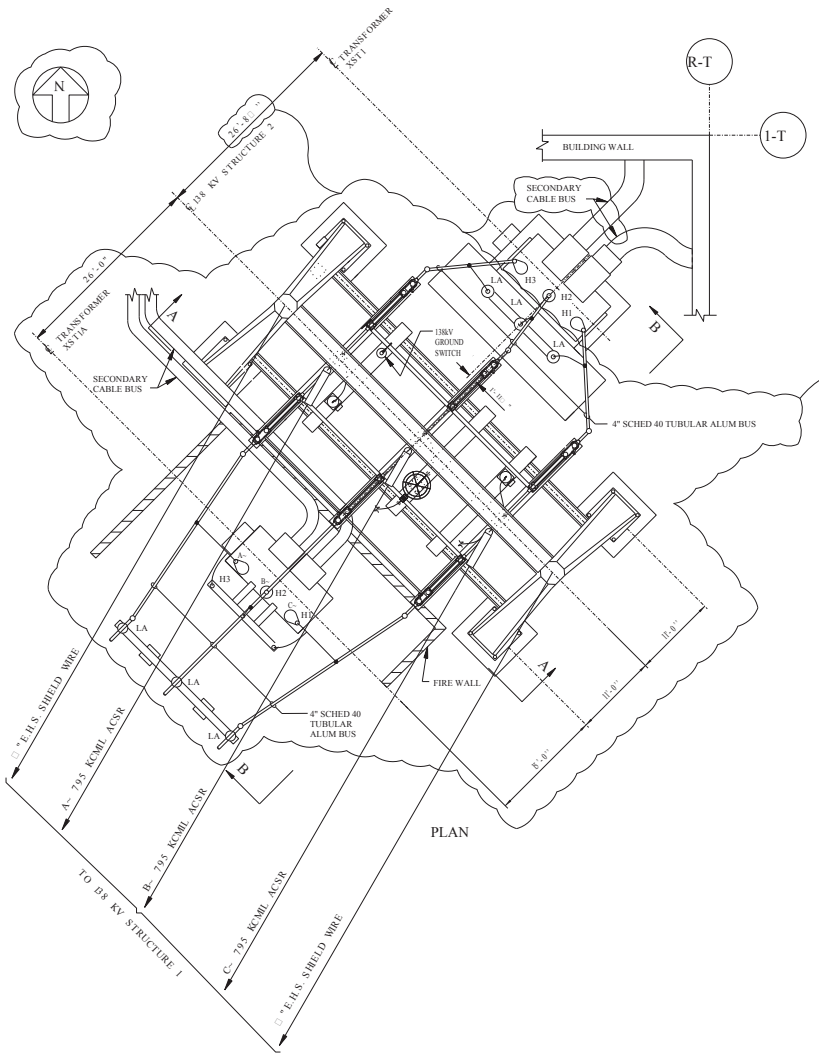
FIGURE 8.2-8 IS DELETED

| 95

CPSSES/FSAR

UNITS 1 & 2

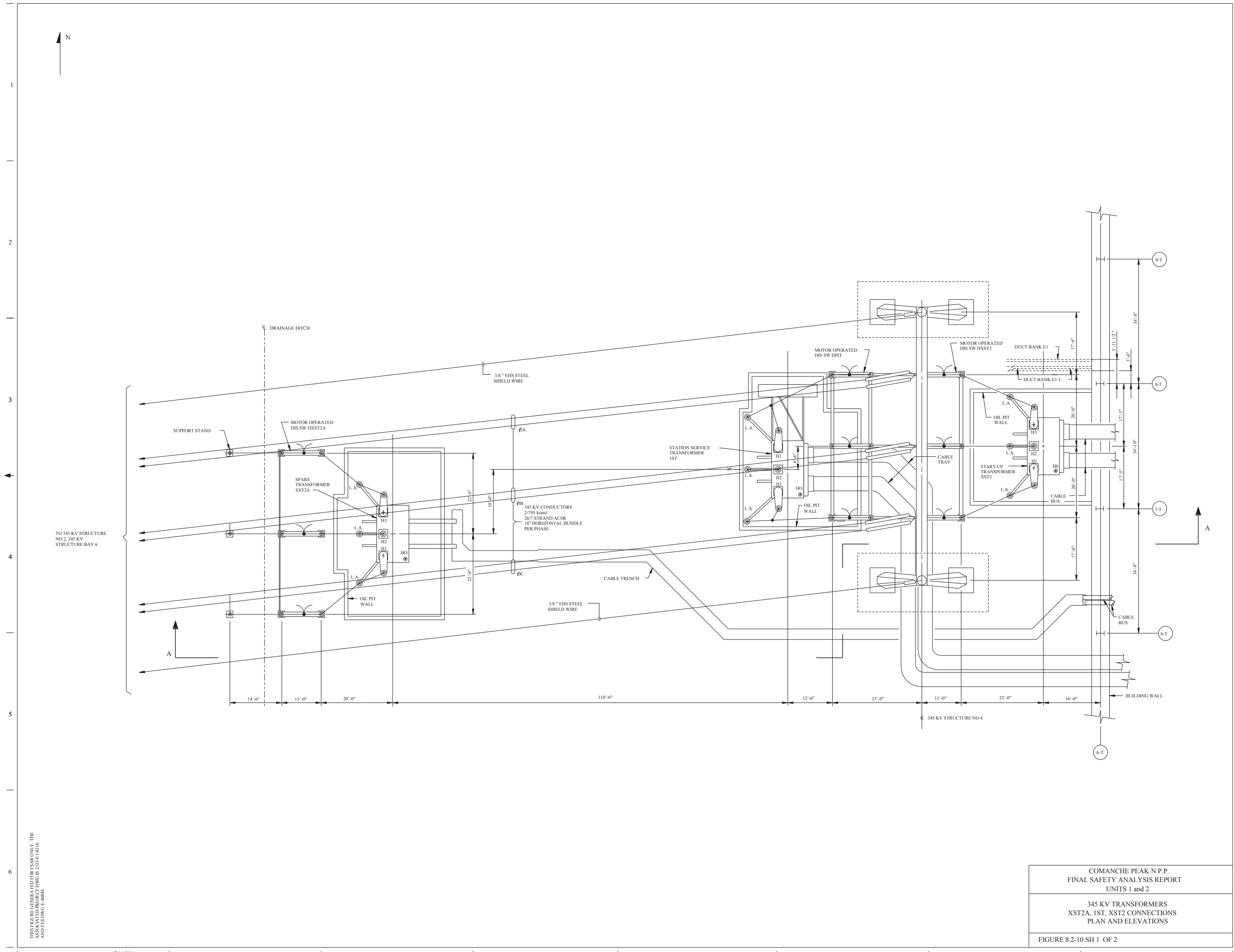
FIGURE 8.2-8a IS DELETED



THIS FIGURE GENERATED FOR ESAR ONLY. THE ASSOCIATED PROJECT DWG IS E1-02-B

Amendment No. 106

COMANCHE PEAK N.P.P. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
138 KV TRANSFORMER CONNECTIONS PLAN AND ELEVATIONS
FIGURE 8.2-9

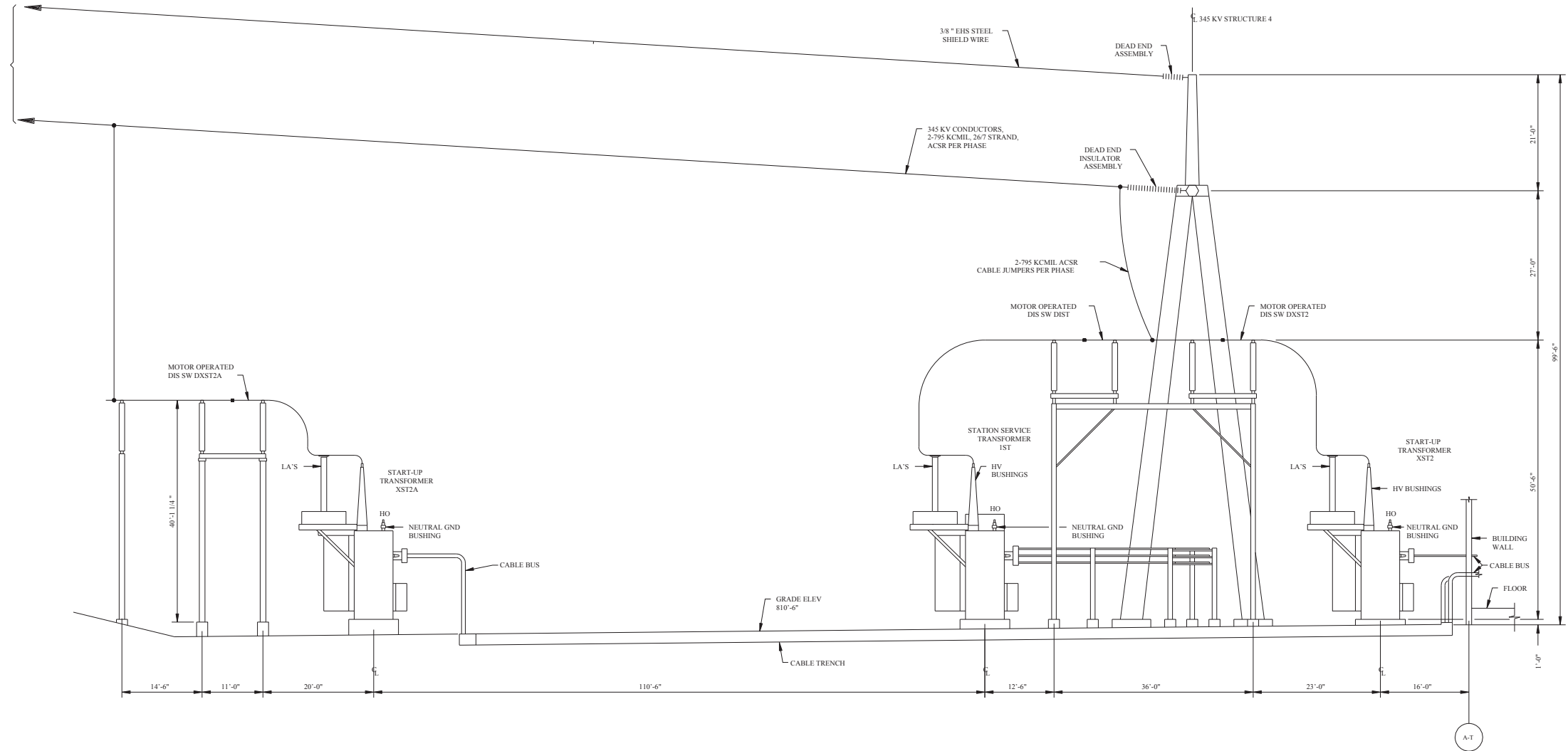


TO 345 KV STRUCTURE  
NO 2, 345 KV  
STRUCTURE BAY 6

345 KV STRUCTURE NO 4

THIS FIGURE GENERATED FOR I&A ONLY. THE  
ASSOCIATED PROJECT DWG IS 2323E1-0216  
AND THE DWG E-4084.

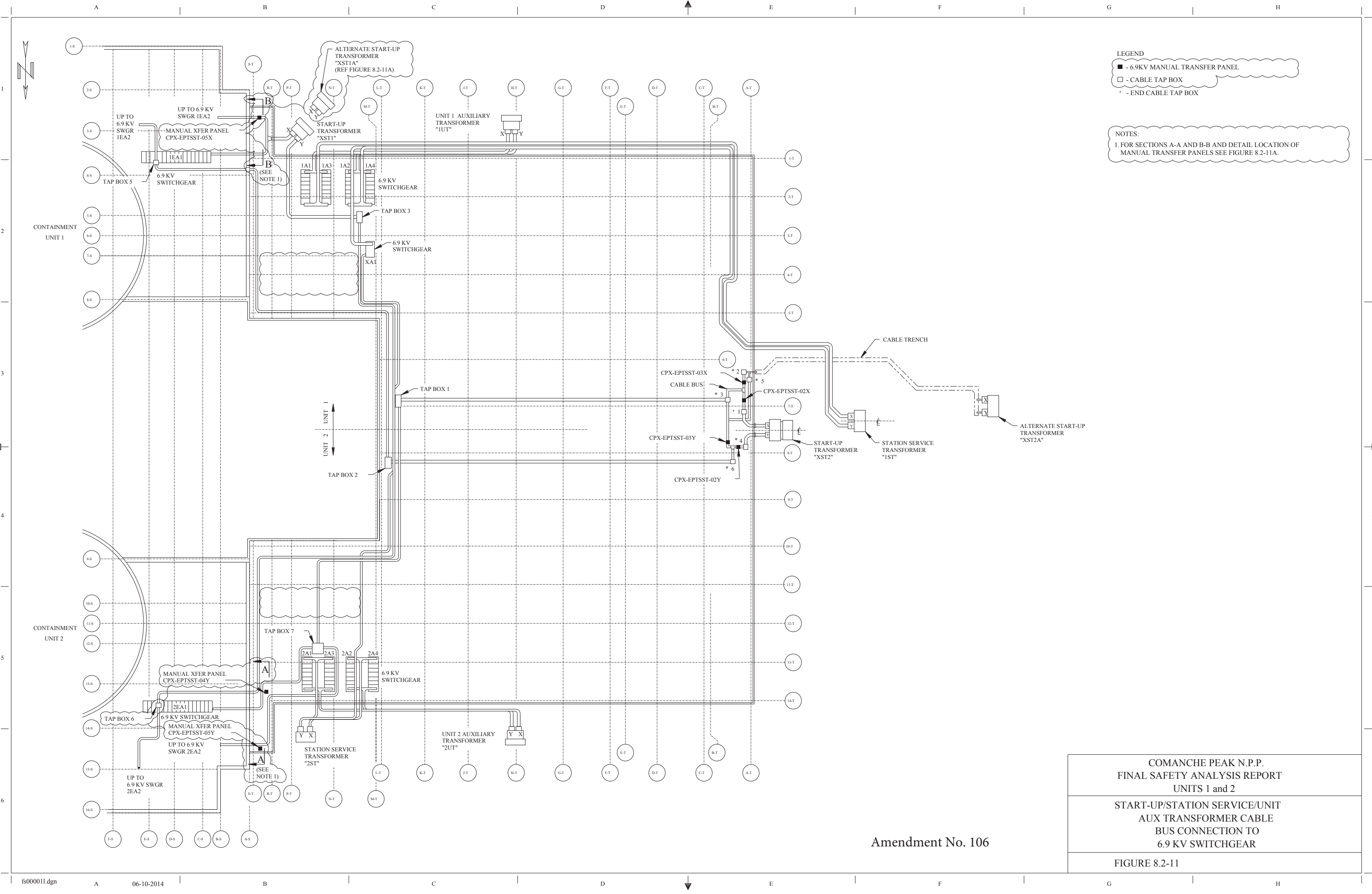
COMANCHE PEAK N.P.P. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
345 KV TRANSFORMERS XST2A, 1ST, XST2 CONNECTIONS PLAN AND ELEVATIONS
FIGURE 8.2-10 SH 1 OF 2



SECTION A-A

THIS FIGURE GENERATED FOR IFSAR ONLY. THE  
 FILE NAME IS: DWG 15-2123-10-02-10  
 AND TSS DWG E-40844

COMANCHE PEAK N.P.P. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
345 KV TRANSFORMERS XST2A, 1ST AND XST2 CONNECTIONS PLAN AND ELEVATIONS
FIGURE 8.2-10 SH 2 OF 2



LEGEND

- - 6.9KV MANUAL TRANSFER PANEL
- - CABLE TAP BOX
- \* - END CABLE TAP BOX

NOTES:

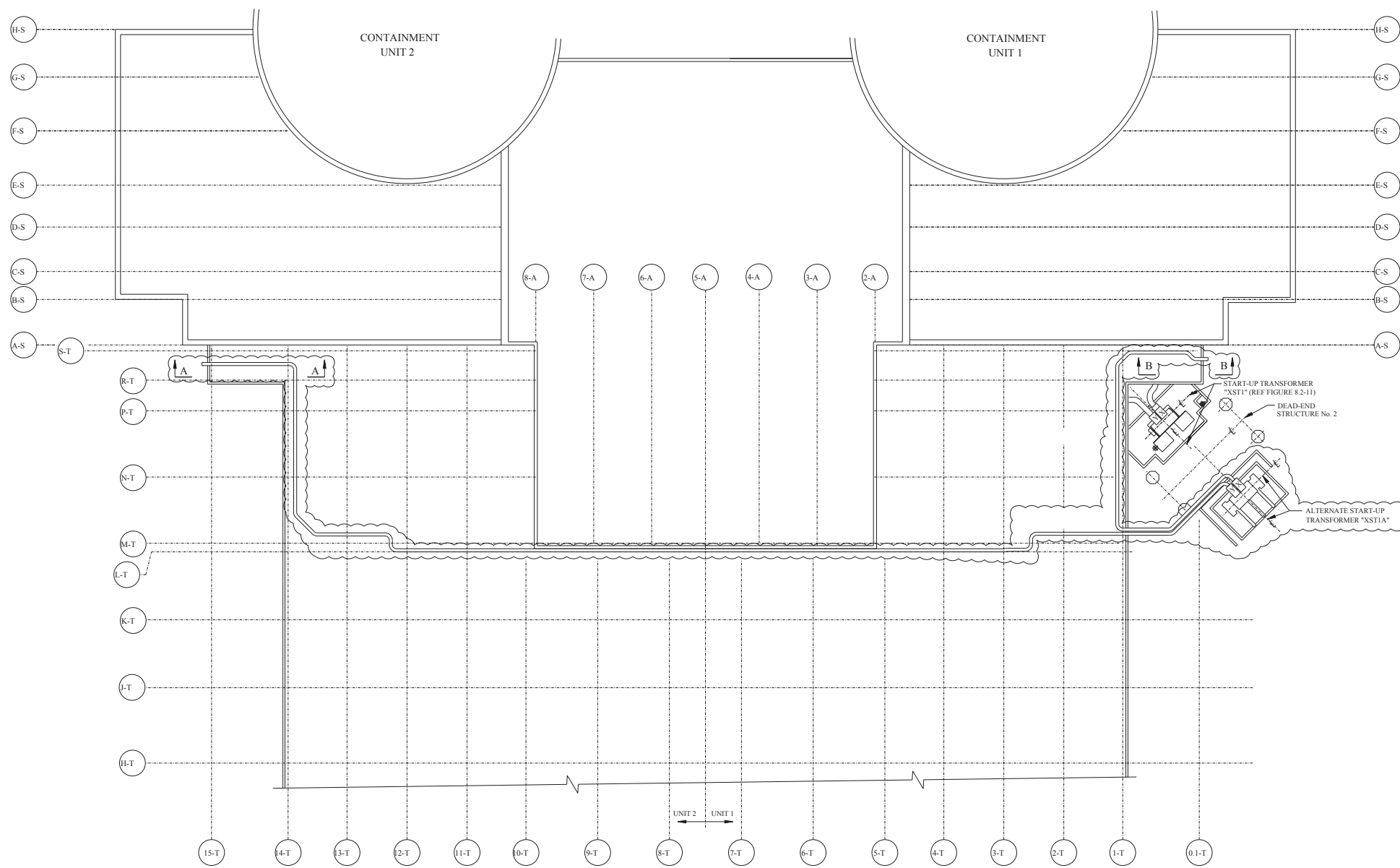
1. FOR SECTIONS A-A AND B-B AND DETAIL LOCATION OF MANUAL TRANSFER PANELS SEE FIGURE 8.2-11A.

COMANCHE PEAK N.P.P.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2

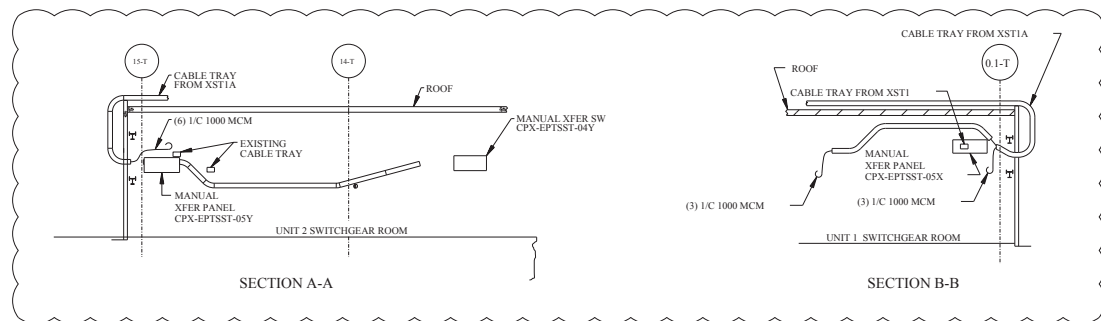
START-UP/STATION SERVICE/UNIT  
 AUX TRANSFORMER CABLE  
 BUS CONNECTION TO  
 6.9 KV SWITCHGEAR

FIGURE 8.2-11

Amendment No. 106



PARTIAL PLAN VIEW



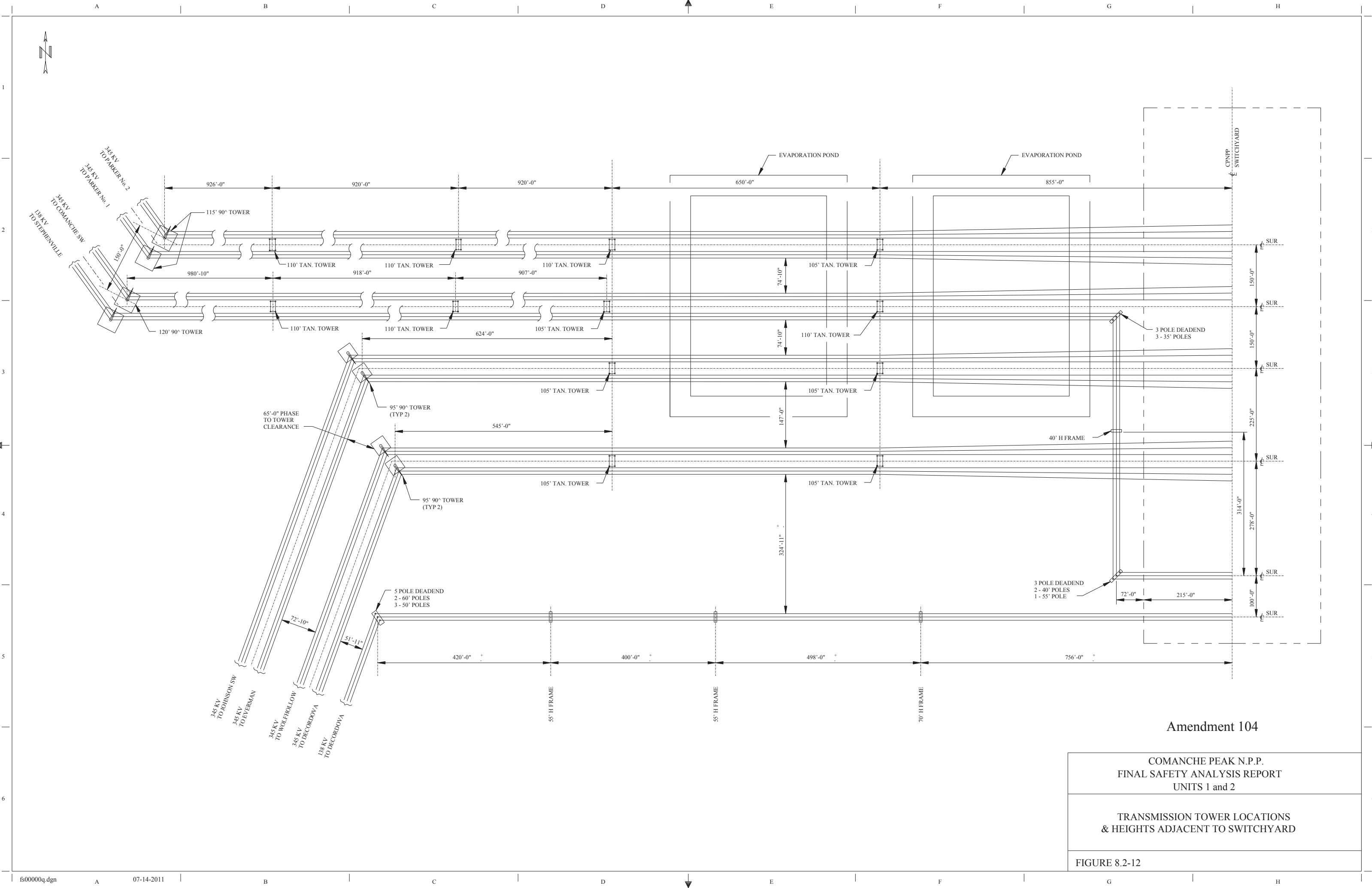
Amendment No. 106

COMANCHE PEAK N.P.P.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

SPARE START-UP  
TRANSFORMER XST1A CABLE  
BUS CONNECTION TO  
6.9 KV SWITCHGEAR

FIGURE 8.2-11A





Amendment 104

COMANCHE PEAK N.P.P.  
 FINAL SAFETY ANALYSIS REPORT  
 UNITS 1 and 2

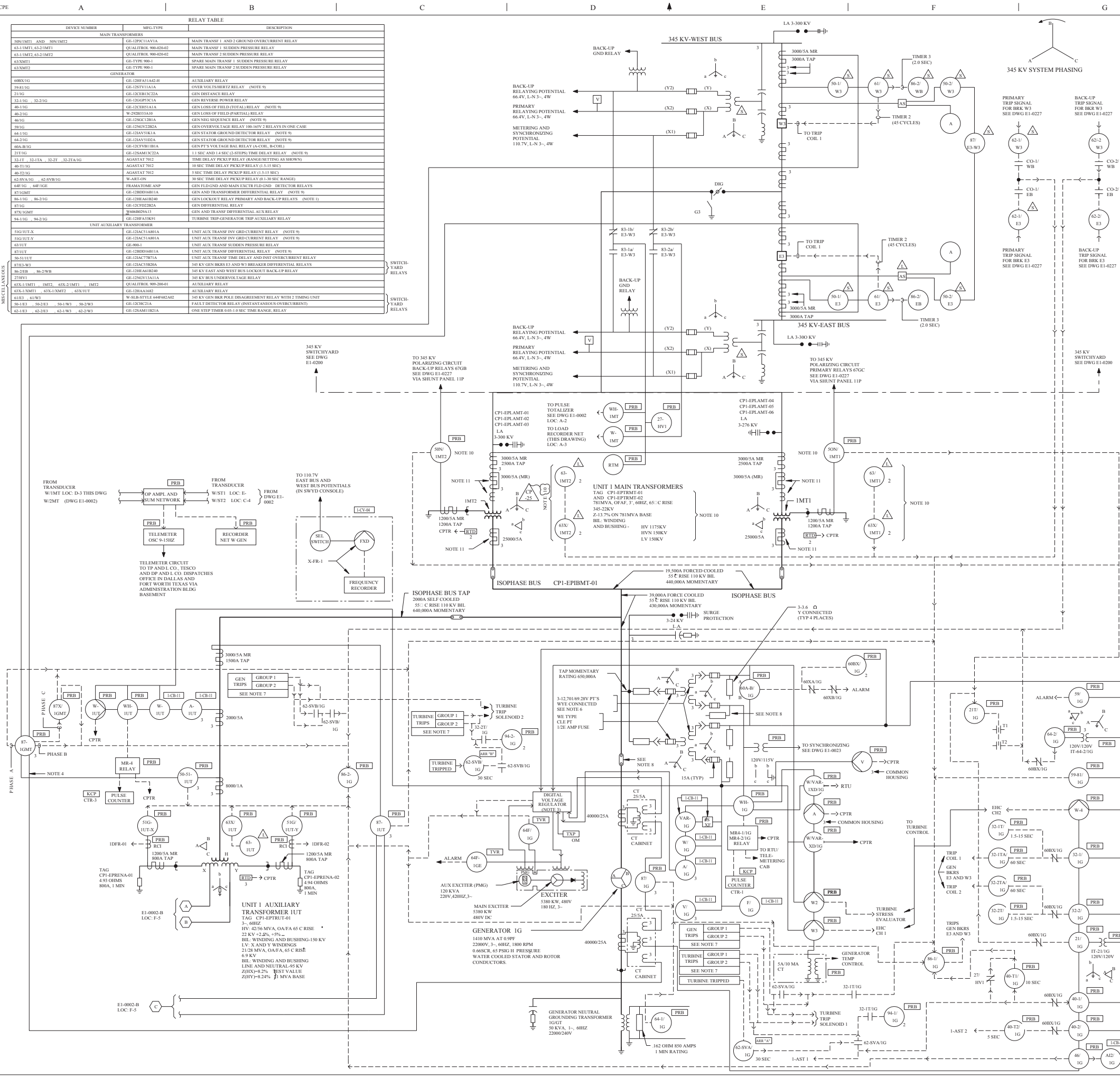
TRANSMISSION TOWER LOCATIONS  
 & HEIGHTS ADJACENT TO SWITCHYARD

FIGURE 8.2-12









DEVI. NUMBER	MG. TYPE	DESCRIPTION
MAIN TRANSFORMERS		
50N/1MT1 AND 50N/1MT2	GE-12P11A1V1A	MAIN TRANSF 1 AND 2 GROUND OVERCURRENT RELAY
63X/1MT1, 63X/2MT1	QUALITROL 900-020-02	MAIN TRANSF 1 SUDDEN PRESSURE RELAY
63X/1MT2, 63X/2MT2	QUALITROL 900-020-02	MAIN TRANSF 2 SUDDEN PRESSURE RELAY
63X/MT1	GE-TYPE 900-1	SPARE MAIN TRANSF 1 SUDDEN PRESSURE RELAY
63X/MT2	GE-TYPE 900-1	SPARE MAIN TRANSF 2 SUDDEN PRESSURE RELAY
GENERATOR		
60BX/1G	GE-21HFA1A42-41	AUXILIARY RELAY
58S/1G	GE-12SV11A1A	OVER VOLTS HERTZ RELAY (NOTE 9)
21/1G	GE-12CB13C2A	GEN DISTANCE RELAY
32-1/1G, 32-2/1G	GE-12G6P5C1A	GEN REVERSE POWER RELAY
40-1/1G, 40-2/1G	GE-12CB11A1A	GEN LOSS OF FIELD (TOTAL) RELAY (NOTE 9)
46-2/1G	W-25B033A8	GEN LOSS OF FIELD (PARTIAL) RELAY
46/1G	GE-12SG12B1A	GEN NEG SEQUENCE RELAY (NOTE 9)
59/1G	GE-12MV12B2A	GEN OVERVOLTAGE RELAY (100/160V 2 RELAYS IN ONE CASE)
64-1/1G	GE-12AV19K1A	GEN STATOR GROUND DETECTOR RELAY (NOTE 9)
64-2/1G	GE-12AV19D2A	GEN STATOR GROUND DETECTOR RELAY (NOTE 9)
60A-B/1G	GE-12CV11B1A	GEN PT'S VOLTAGE BAL RELAY (A, C, OH, B, COIL)
21/1G	GE-12SAM13C2A	11 SEC AND 1.4 SEC (2-STEP) TIME DELAY RELAY (NOTE 9)
32-1T, 32-1TA, 32-2T, 32-2TA/1G	AGASTAT 7012	TIME DELAY PICKUP RELAY (RANGE SETTING AS SHOWN)
40-1/1G	AGASTAT 7012	30 SEC TIME DELAY PICKUP RELAY (1.5-15 SEC)
46-2/1G	AGASTAT 7012	5 SEC TIME DELAY PICKUP RELAY (1.5-15 SEC)
62-SVA/1G, 62-SVB/1G	W-ART-0N	30 SEC TIME DELAY PICKUP RELAY (1.30 SEC RANGE)
64F/1G, 64F/1GE	FRAMA TIME ANP	GEN FLD GND AND MAIN EXCTR FLD GND DETECTOR RELAYS
67/1G	GE-12DB06B1A	GEN AND TRANSFORMER DIFFERENTIAL RELAY (NOTE 9)
86-1/1G, 86-2/1G	GE-12DEA61B240	GEN LOCKOUT RELAY PRIMARY AND BACK-UP RELAYS (NOTE 1)
87/1G	GE-12CTD2B2A	GEN DIFFERENTIAL RELAY
87X/1G, 87X/1GT	W-800B2N1A1	GEN AND TRANSF DIFFERENTIAL AUX RELAY
94-1/1G, 94-2/1G	GE-12TPA31K1	TURBINE TRIP-GENERATOR TRIP AUXILIARY RELAY
UNIT AUXILIARY TRANSFORMER		
51G/1T-X, 51G/1T-Y	GE-12AC1A801A	UNIT AUX TRANSF INV GRD CURRENT RELAY (NOTE 9)
63/1T	GE-900-1	UNIT AUX TRANSF SUDDEN PRESSURE RELAY
87/1T	GE-12DB06B1A	UNIT AUX TRANSF DIFFERENTIAL RELAY (NOTE 9)
50-S1/1T	GE-12AC17801A	UNIT AUX TRANSF TIME DELAY AND INST OVERCURRENT RELAY
87E3-W3, 86-2EB, 86-2WB	GE-12AC15B30A	345 KV GEN BKRS E3 AND W3 BREAKER DIFFERENTIAL RELAYS
27AV	GE-12SV13A1A	345 KV BUS UNDERVOLTAGE RELAY
63X/1MT1, 63X/2MT1, 63X/1MT2, 63X/2MT2	QUALITROL 900-200-01	AUXILIARY RELAY
61E3, 61W3	W-SL-STYLE 64402A02	345 KV GEN BKRS POLE DISAGREEMENT RELAY WITH 2 TIMING UNIT
50-1E3, 50-2E3, 50-1W3, 50-2W3	GE-12CH21A	FAULT DETECTOR RELAY (INSTANTANEOUS OVERCURRENT)
62-1E3, 62-2E3, 62-1W3, 62-2W3	GE-12SAM11B21A	ONE STEP TIMER 0.03-1.0 SEC TIME RANGE RELAY

### FSAR FIGURE 8.3-2

REV 01/25  
 01/25  
 01/25

THIS DRAWING REVISED TO INCORPORATE EDITORIAL CHANGE AS NOTED PER 04-2013-001-02-1

REV	CHKD	DATE	BY	REMARKS
01		01/25		
02		01/25		
03		01/25		

**LEGEND**

ARR	AUXILIARY RELAY RACK	EHC	ELECTRO HYDRAULIC CONTROL
1-CB-11	CONTROL ROOM PANEL 1-CB-11	TXP	TELETYPE XP
SW	SWITCHYARD RELAY HOUSE	AS	AMMETER SWITCH
TVR	THYRISTOR VOLTAGE REGULATOR (TVR) CABINET	1-CV-04	RECORDER PANEL IN CONTROL ROOM (1-CV-04)
RES	RESISTOR	3	3 CTS WYE CONNECTED
CCPD	COUPLING CAPACITOR POTENTIAL DEVICE (CCPD)	3	3 CTS DELTA CONNECTED
XD	TRANSDUCER (XD)	3	3 CTS WYE CONNECTED
DISC	DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER	3	3 CTS WYE CONNECTED
IB	ISOPHASE BUS DISCONNECT LINK	3	3 CTS WYE CONNECTED
CB	CIRCUIT BREAKER	3	3 CTS WYE CONNECTED
CPTR	COMPUTER	3	3 CTS WYE CONNECTED
EKCP	ELECTRONIC KW/H COUNTER PANEL IN CONTROL ROOM	3	3 CTS WYE CONNECTED
LOC	LOCAL	3	3 CTS WYE CONNECTED
PRB	PROTECTIVE RELAY BOARD	3	3 CTS WYE CONNECTED
A	AMMETER	3	3 CTS WYE CONNECTED
V	VOLTMETER	3	3 CTS WYE CONNECTED
W	WATTMETER	3	3 CTS WYE CONNECTED
WHM	WATT HOUR METER	3	3 CTS WYE CONNECTED
RTM	RUNNING TIME METER	3	3 CTS WYE CONNECTED
RTD	RES TEMP DETECTOR FOR TRANSFORMERS, ONE FOR EACH LOW VOLTAGE WINDINGS HOT SPOT AND ONE FOR OIL TEMP	3	3 CTS WYE CONNECTED
OM	OPERATING AND MONITORING STATION	3	3 CTS WYE CONNECTED
CT	CURRENT TRANSFORMER	3	3 CTS WYE CONNECTED
LA	LIGHTNING ARRESTOR	3	3 CTS WYE CONNECTED
RCT	REMOTE CURRENT ISOLATOR AND COUPLING UNIT	3	3 CTS WYE CONNECTED
RF	RF MONITORING CAPACITOR AND COUPLING UNIT	3	3 CTS WYE CONNECTED

**NOTES**

- FOR TRIP CLOSE AND BLOCK FUNCTIONS PERFORMED BY LOCKOUT RELAY 86-1/1G AND 86-2/1G SEE DWG E1-0022 AND E1-0022-A.
- DELETED
- GENERATOR VOLTAGE REGULATOR CUBICLE INCLUDES:
  - a) VOLT/HERTZ LIMITER
  - b) MINIMUM EXCITATION LIMITER
  - c) MAXIMUM EXCITATION LIMITER
- CONNECTED TO DIFFERENTIAL RELAY TERMINAL 7 WHICH HAS NO THRU CURRENT RESTRAINT.
- ITEMS MARKED WITH \* ARE SUPPLIED BY ACPSI.
- GENERATOR POTENTIAL TRANSFORMERS HAVE SUFFICIENT IRON TO PREVENT SATURATION WITH 1.05 X 23,000 = 23,100 VOLTS IMPRESSED ON THE PT PRIMARY.
- GROUP 1 TG TRIPS ARE THOSE WHERE GENERATOR TRIP IS DELAYED FOR 30 SECONDS SUBSEQUENT TO A REACTOR TRIP. GROUP 2 TG TRIPS DO NOT PERMIT SUCH A DELAY. SEE DWG E1-0022 FOR DETAILS.
- PRIOR TO ENERGIZING THE 22 KV SYSTEM, THE FOLLOWING MUST BE VERIFIED:
  - FOR GENERATOR LINKS IN PLACE, GENERATOR POTENTIAL TRANSFORMER SECONDARY RESISTORS ARE DISCONNECTED AND VICE VERSA.
  - TARGET RESET MECHANISM FOR THE RELAY IS REMOVED.
- IF MAIN TRANSFORMERS 1MT1/2 (CP1-EPTMT-01, -02) ARE REPLACED WITH SPARE TRANSFORMERS XMT1/2 (CPX-EPTMT-01, -02) THE FOLLOWING CHANGES APPLY:
  - A. RATING OF TRANSFORMERS WILL CHANGE AS FOLLOWS: TAG CPX-EPTMT-01 AND CPX-EPTMT-02: 6500VA, F0A, 3, 60HZ, 65-C RISE 345KV/20.9KV 2.9% ON 650MVA BASE; BIL WINDING - HV 1050KV BUSHING - HV 1175KV HVN 150KV LV 150KV
  - B. SUDDEN PRESSURE RELAYS 63-1, -2/1MT1 WILL BE REPLACED BY RELAY 63X/MT1.
  - SUDDEN PRESSURE RELAYS 63-1, -2/1MT2 WILL BE REPLACED BY RELAY 63X/MT2.
  - C. AUXILIARY RELAYS 63X-1, -2/1MT1 WILL BE REPLACED BY RELAY 63X-1/1MT1 (IN PRB).
  - AUXILIARY RELAYS 63X-1, -2/1MT2 WILL BE REPLACED BY RELAY 63X-1/1MT2 (IN PRB).
- THESE CTS ARE ONLY INSTALLED ON MAIN TRANSFORMERS 1MT1/2 AND NOT ON XMT1/XMT2.

**REFERENCE DRAWINGS**

E1-0001	PLANT ONE LINE DIAGRAM UNITS 1 AND 2
E1-0001-A	PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON
E1-0002	MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
E2-0001-A	PLANT ONE LINE DIAGRAM (UNIT 2)
E1-0002-B	MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
E2-0002	MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
E2-0002-A	MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
E1-0227	345 KV SWITCHYARD RELAY FUNCTIONAL DIAGRAM
E1-0212	345 KV SWITCHYARD KEY INTERLOCK SCHEMATIC DIAGRAM

DRAWING 2323-E1-0002 REV CP-2  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
 E1-0002  
 E1-0002-A

**NON-SAFETY**

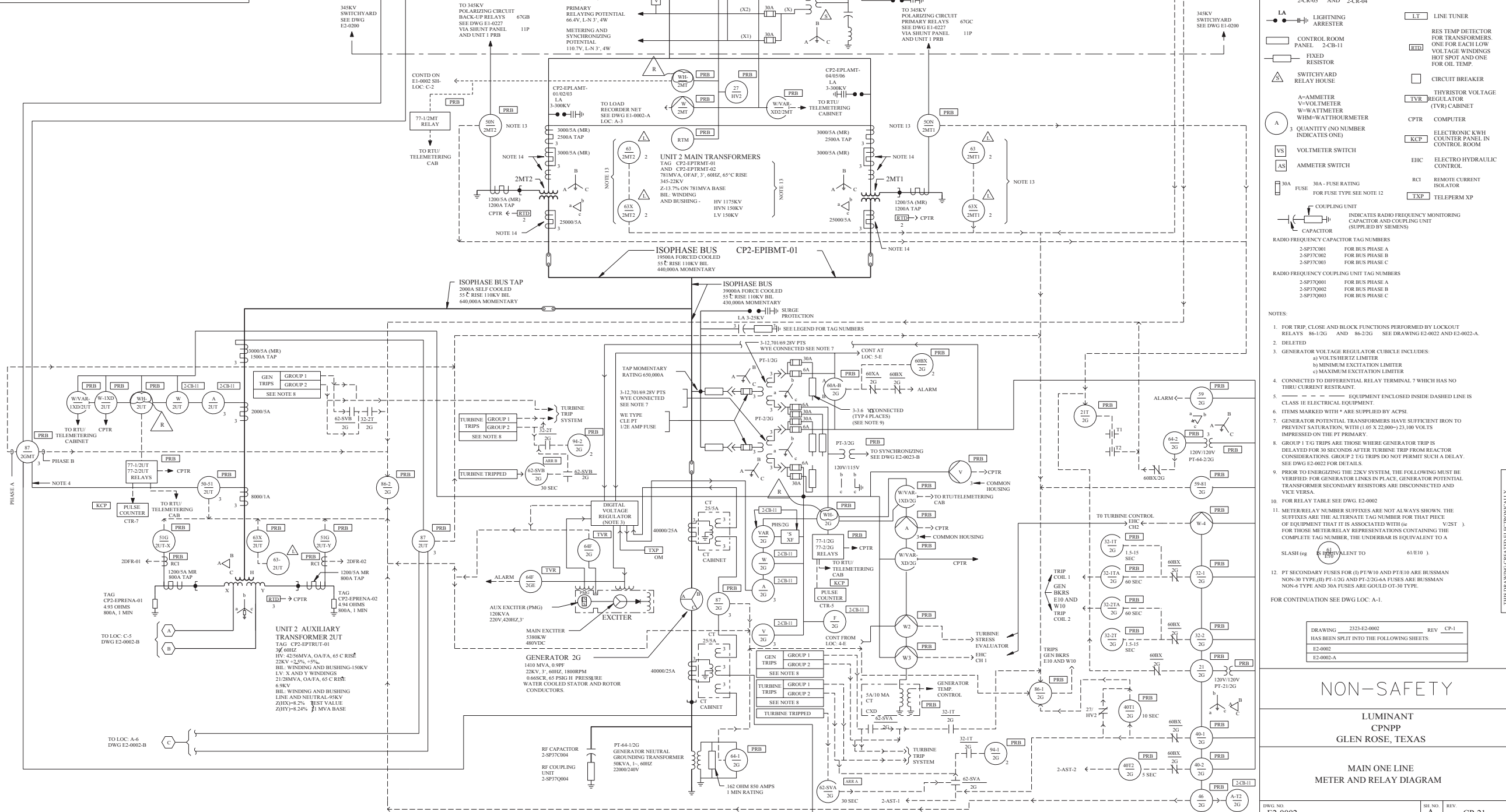
LUMINANT  
 CPNPP  
 GLEN ROSE, TEXAS

MAIN ONE LINE  
 METER & RELAY DIAGRAM

DWG NO E1-0002 SH NO A REV CP-25



- NOTES (CONTINUED)
- IF MAIN TRANSFORMERS 2MT1/2 (CP2-EPRMT-01, -02) ARE REPLACED WITH SPARE TRANSFORMERS XMT1/2 (CPX-EPRMT-01, -02) THE FOLLOWING CHANGES APPLY:
    - RATING OF TRANSFORMERS WILL CHANGE AS FOLLOWS:  
TAG CPX-EPRMT-01 AND CPX-EPRMT-02 650MVA, O.A.F.A. 3, 60HZ, 65°C RISE 345KV-20.9KV Z-9.0% ON 650MVA BASE BIL. WINDING - HV 1050KV LV 150KV HV 1175KV HVN 150KV LV 150KV
    - SUDDEN PRESSURE RELAYS 63-1, -2/2MT1 WILL BE REPLACED BY RELAY 63/XMT1.  
SUDDEN PRESSURE RELAYS 63-1, -2/2MT2 WILL BE REPLACED BY RELAY 63/XMT2.
    - AUXILIARY RELAYS 63X-1, -2/2MT1 WILL BE REPLACED BY RELAY 63X/XMT1 (N PRB).  
AUXILIARY RELAYS 63X-1, -2/2MT2 WILL BE REPLACED BY RELAY 63X/XMT2 (N PRB).
  - THESE CTS ARE ONLY INSTALLED ON MAIN TRANSFORMERS 2MT1/2 AND NOT ON XMT1/XMT2.
- REFERENCES:
- |           |  |
|-----------|--|
| E1-0001   | PLANT ONE LINE DIAGRAM UNITS 1 AND 2             |
| E1-0001-A | PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON         |
| E1-0002   | MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)   |
| E1-0002-A | MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)   |
| E1-0002-B | MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)   |
| E2-0001-A | PLANT ONE LINE DIAGRAM (UNIT 2)                  |
| E2-0002-B | MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)   |
| E2-0227   | 345KV SWITCHYARD RELAY FUNCTIONAL DIAGRAM        |
| E2-0212   | 345KV SWITCHYARD KEY INTERLOCK SCHEMATIC DIAGRAM |



**FSAR FIGURE 8.3-2**

LEGEND:

PROTECTIVE RELAY BOARD	PHASE SHIFTING TRANSFORMER
LOCAL	SOLID STATE PROTECTION CABINET (REACTOR PROTECTION SYSTEM)
OPERATING AND MONITORING STATION	TURBINE AUTOMATIC STOP TRIP SOLENOID
COUPLING CAPACITOR POTENTIAL DEVICE (CCPD)	3 CTS DELTA CONNECTED
RUNNING TIME METER	3 CTS WYE CONNECTED
DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER	TRANSDUCER (XD)
LOCATION	NEGATIVE SEQUENCE CURRENT METER
QUANTITY (NO NUMBER INDICATES ONE)	MANUAL DISCONNECT SWITCH
AUXILIARY RELAY RACK 2-CR-03 AND 2-CR-04	LINE TUNER
LIGHTNING ARRESTER	RES TEMP DETECTOR FOR TRANSFORMERS, ONE FOR EACH LOW VOLTAGE WINDING HOT SPOT AND ONE FOR OIL TEMP.
CONTROL ROOM PANEL 2-CB-11	THYRISTOR VOLTAGE REGULATOR (TVR) CABINET
FIXED RESISTOR	COMPUTER
SWITCHYARD RELAY HOUSE	ELECTRONIC KWH COUNTER PANEL IN CONTROL ROOM
A=AMMETER V=VOLTMETER W=WATTMETER WHM=WATT/WHMETER	ELECTRO HYDRAULIC CONTROL
QUANTITY (NO NUMBER INDICATES ONE)	REMOTE CURRENT ISOLATOR
VOLTMETER SWITCH	TELEPERM XP
AMMETER SWITCH	CAPACITOR
FUSE 30A - FUSE RATING FOR FUSE TYPE SEE NOTE 12	INDICATES RADIO FREQUENCY MONITORING CAPACITOR AND COUPLING UNIT (SUPPLIED BY SIEMENS)

RADIO FREQUENCY CAPACITOR TAG NUMBERS

2-SP37C001	FOR BUS PHASE A
2-SP37C002	FOR BUS PHASE B
2-SP37C003	FOR BUS PHASE C

RADIO FREQUENCY COUPLING UNIT TAG NUMBERS

2-SP37C001	FOR BUS PHASE A
2-SP37C002	FOR BUS PHASE B
2-SP37C003	FOR BUS PHASE C

NOTES:

- FOR TRIP, CLOSE AND LOCK FUNCTIONS PERFORMED BY LOCKOUT RELAYS 86-1/2G AND 86-2/2G SEE DRAWING E2-0023 AND E2-0022-A.
- DELETED
- GENERATOR VOLTAGE REGULATOR CUBICLE INCLUDES:
  - VOLTS/HERTZ LIMITER
  - MINIMUM EXCITATION LIMITER
  - MAXIMUM EXCITATION LIMITER
- CONNECTED TO DIFFERENTIAL RELAY TERMINAL 7 WHICH HAS NO THRU CURRENT RESTRAINT.
- EQUIPMENT ENCLOSED INSIDE DASHED LINE IS CLASS I/E ELECTRICAL EQUIPMENT.
- ITEMS MARKED WITH \* ARE SUPPLIED BY ACPSS.
- GENERATOR POTENTIAL TRANSFORMERS HAVE INSUFFICIENT IRON TO PREVENT SATURATION, WITH (1.05 X 22,000) = 23,100 VOLTS IMPRESSED ON THE PT PRIMARY.
- GROUP 1 TAG TRIPS ARE THOSE WHERE GENERATOR TRIP IS DELAYED FOR 30 SECONDS AFTER TURBINE TRIP FROM REACTOR CONSIDERATIONS. GROUP 2 TAG TRIPS DO NOT PERMIT SUCH A DELAY. SEE DWG E2-0022 FOR DETAILS.
- PRIOR TO ENERGIZING THE 22KV SYSTEM, THE FOLLOWING MUST BE VERIFIED FOR GENERATOR LINKS IN PLACE: GENERATOR POTENTIAL TRANSFORMER SECONDARY RESISTORS ARE DISCONNECTED AND VICE VERSA.
- FOR RELAY TABLE SEE DWG E2-0002
- METER RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN: THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PERCENT OF EQUIPMENT THAT IS ASSOCIATED WITH (60 V/2ST) FOR THOSE METER RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER, THE UNDERBAR IS EQUIVALENT TO A SLASH (eg  $\frac{61E10}{2}$  IS EQUIVALENT TO 61E10)
- PT SECONDARY FUSES FOR (D) PTW10 AND PTE10 ARE BUSSMAN NON-30 TYPE (D) PT-1/2G AND PT-2/2G-6A FUSES ARE BUSSMAN NON-6 TYPE AND 30A FUSES ARE GULDD OT-30 TYPE.

FOR CONTINUATION SEE DWG LOC. A-1.

DRAWING 2232-E2-0002 REV CP-1  
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
E2-0002  
E2-0002-A

NON-SAFETY

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

MAIN ONE LINE  
METER AND RELAY DIAGRAM

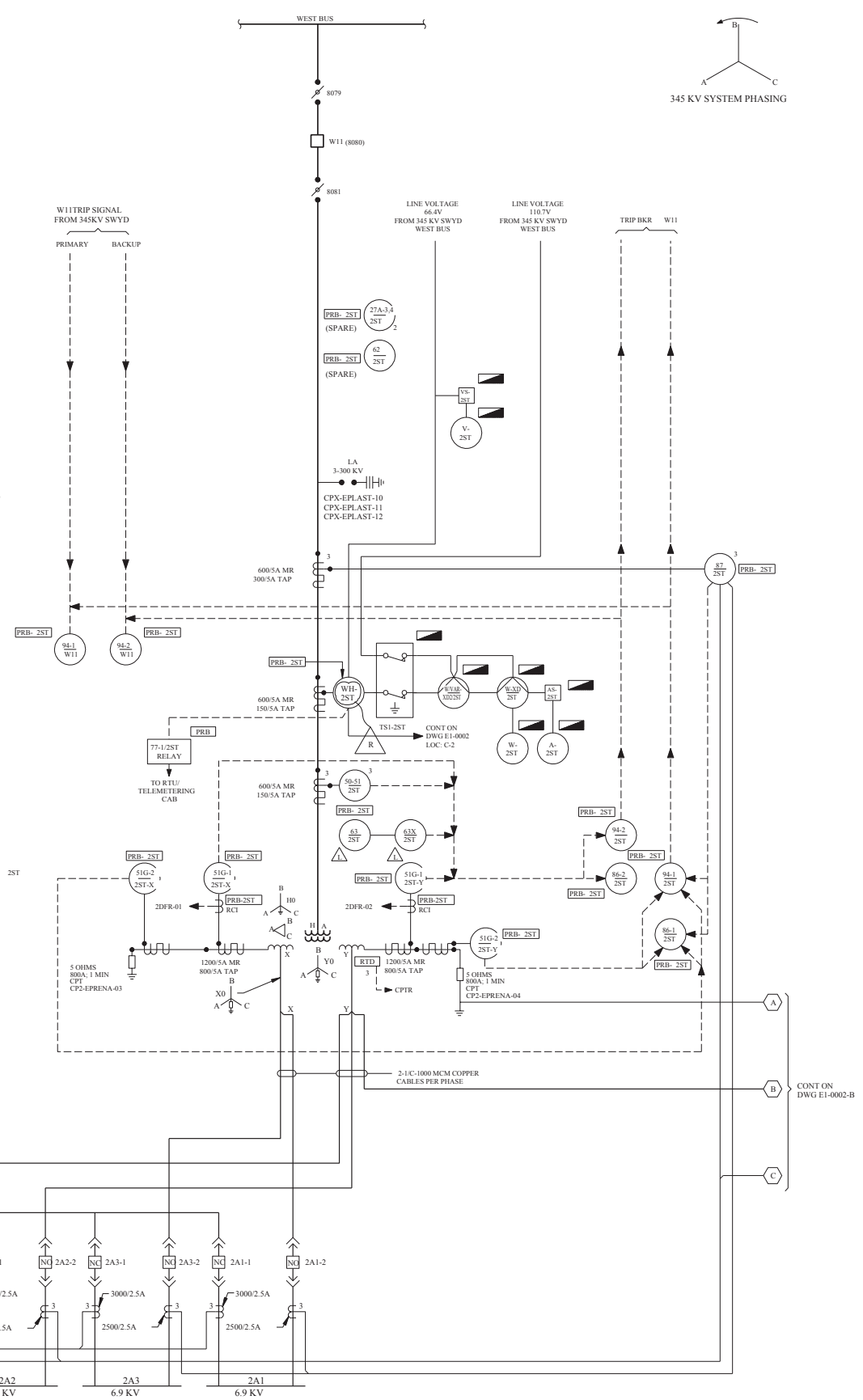
THIS DRAWING CREATED ELECTRONICALLY

REV: 2018  
REV: 2018  
REV: 2018

REMARKS: THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE (FDA-20A-003029-01-00 PER BR 52-0007-04-003029-01-00)

CP-21

RELAY TABLE		
DEVICE NUMBER	MFG-TYPE	DESCRIPTION
MAIN TRANSFORMERS		
50N2MT1, 50N2MT2	GE-12PIC1A1A	MAIN TRANSF 1 AND 2 GRD OVERCURRENT RELAY
63-1/2MT1, 63-2/2MT1	QUALITROL 900-020-02	MAIN TRANSF 1 SUDDEN PRESSURE RELAY
63-1/2MT2, 63-2/2MT2	QUALITROL 900-020-02	MAIN TRANSF 2 SUDDEN PRESSURE RELAY
63XMT1	GE-TYPE 900-1	SPARE MAIN TRANSF 1 SUDDEN PRESSURE RELAY
63XMT2	GE-TYPE 900-1	SPARE MAIN TRANSF 2 SUDDEN PRESSURE RELAY
GENERATOR		
60BX/2G	GE-12HFA51A2H	AUXILIARY RELAY
59-81/2G	GE-12STV11A1A	OVER VOLTS/HERTZ RELAY (SEE NOTE 2)
21/2G	GE-12SLY2A4D	GEN DISTANCE RELAY
32-1/2G, 32-2/2G	GE-12GGP53C1A	GEN REVERSE POWER RELAY
SWITCHYARD RELAYS		
40-1/2G	GE-12CEH51A1A	GEN LOSS OF FIELD (TOTAL) RELAY (SEE NOTE 2)
40-2/2G	W-292B33A10	GEN LOSS OF FIELD (PARTIAL) RELAY
46/2G	GE-12SGC12B1A	GEN NEG SEQUENCE RELAY (SEE NOTE 2)
59/2G	GE-12NGV22B2A	GEN OVERVOLTAGE RELAY (100-165V, 2 RELAYS IN ONE CASE)
64-1/2G	GE-12IAV51K1A	GEN STATOR GROUND DETECTOR RELAY (SEE NOTE 2)
64-2/2G	GE-12IAV51D2A	GEN STATOR GROUND DETECTOR RELAY (SEE NOTE 2)
60A-B/2G	GE-12CFVB11B1A	GEN PTS VOLTAGE BAL RELAY (A-COIL, B-COIL)
21T/2G	GE-12SAM13C22A	1.1 SEC AND 1.4 SEC (2-STEPS) TIME DELAY RELAY (SEE NOTE 2)
32-1T/2G, 1TA/2G, 2T/2G, 2TA/2	AGASTAT 7012	TIME DELAY PICKUP RELAY (RANGE/SETTING AS SHOWN)
40-1T/2G	AGASTAT 7012	10 SEC TIME DELAY PICKUP RELAY (1.5-15 SEC RANGE)
40-1T/2G	AGASTAT 7012	5 SEC TIME DELAY PICKUP RELAY (1.5-15 SEC RANGE)
62-SVA/2G, 62-SVB/2G	W-ART-ON	30 SEC TIME DELAY PICKUP RELAYS (0.1-30 SEC RANGE)
64F/2G, 64F/2GE	FRAMATOME ANP	GEN FLD GND AND MAIN EXCTR FLD GND DETECTOR RELAYS
87/2G	GE-12BDD16B11A	GEN AND TRANSFORMER DIFFERENTIAL RELAY (SEE NOTE 2)
86-1, 86-2/2G	GE-12HEA61B240	GEN LOCKOUT RELAY PRIMARY AND BACK-UP RELAYS
87/2G	GE-12CFD22B2A	GEN DIFFERENTIAL RELAY
87X/2G	W-606B029A13	GEN AND TRANSF DIFFERENTIAL AUX RELAY
94-1/2G, 94-2/2G	GE-12HFA53K91	TURBINE TRIP-GENERATOR TRIP AUXILIARY RELAY
UNIT AUXILIARY TRANSFORMER		
51G/2UT-X	GE-12IAC51A801A	UNIT AUX TRANSF INV GRD CURRENT RELAY (SEE NOTE 2)
51G/2UT-Y	GE-12IAC51A801A	UNIT AUX TRANSF INV GRD CURRENT RELAY (SEE NOTE 2)
63/2UT	GE-900-1	UNIT AUX TRANSF SUDDEN PRESSURE RELAY
87/2UT	GE-12BDD16B11A	UNIT AUX TRANSF DIFFERENTIAL RELAY (SEE NOTE 2)
50-51/2UT	GE-12IAC77B11A	UNIT AUX TRANSF TIME DELAY AND INST OVERCURRENT RELAY (SEE NOTE 2)
MISCELLANEOUS		
27HV2	GE-12NGV13A11A	345KV BUS UNDERVOLTAGE RELAY
63X-1/2MT1, 2MT2, 63X-2/2MT1, 2MT2	QUALITROL 909-200-01	AUXILIARY RELAY
63X/XMT1, XMT2, 2UT	GE-12HAA16B2	AUXILIARY RELAY
61/E10, 61/W10	W-SLB STYLE 644F682A02	345KV GEN BREAKER POLE DISAGREEMENT RELAY WITH 2 TIMING UNITS
50-1/E10, 50-2/E10, 50-1/W10, 50-2/W10	GE-12CHC21A	FAULT DETECTOR RELAY
62-1/E10, 62-2/E10, 62-1/W10, 62-2/W10	GE-12SAM11B21A	ONE STEP TIMER, 0.03-1.0 SEC TIME RANGE RELAY
50-51/2ST	GE-12IAC77B811A	STATION SERVICE TRANSF TIME DELAY AND INST OVER CURRENT RELAY
51G-1/2ST-X, 51G-2/2ST-X	GE-12IAC51A801A	STATION SERVICE TRANSF INV GRD OVER CURRENT RELAY
51G-1/2ST-Y, 51G-2/2ST-Y	GE-12IAC51A801A	STATION SERVICE TRANSF INV GRD OVER CURRENT RELAY
63/2ST	QUALITROL 900	STATION SERVICE TRANSF SUDDEN PRESSURE RELAY
86-1/2ST, 86-2/2ST	GE-12HEA61B240	STATION SERVICE TRANSF LOCKOUT, PRIMARY AND BACK-UP RELAYS
87/2ST	GE-12BDD16B11A	STATION SERVICE TRANSF DIFFERENTIAL RELAY
63X/2ST	GE-12HAA16B2	AUXILIARY RELAY
27A-3/2ST AND 27A-4/2ST	ITE-27N(211 TO 375)	SPARE
62/2ST	AGA-7012PE	SPARE
94-1/2ST, 94-2/2ST, 94-1/W11, 94-2/W11	GE-12HFA53K91	AUXILIARY TRIPPING RELAY



REV	DWN	CHK	APPV	REMARKS
CP-8	08/11/2010	08/11/2010		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-003029-01-00 PER SR-001-04-003029-01-00

FSAR FIGURE 8.3-2

- LEGEND:
- PRB-2ST PROTECTIVE RELAY BOARD 2-CR-10
  - LOCAL
  - DRAWOUT DISCONNECT FOR BREAKER
  - LOCATION
  - QUANTITY (NO NUMBER INDICATES ONE)
  - TRANSUCER (XD)
  - MANUAL DISCONNECT SWITCH
  - LIGHTNING ARRESTER
  - RES TEMP DETECTOR FOR TRANSFORMERS ONE FOR EACH LOW VOLTAGE WINDINGS HOT SPOT AND ONE FOR OIL TEMP
  - FIXED RESISTOR
  - SWITCHYARD CONSOLE (CONTROL ROOM) X-CB-12
  - CIRCUIT BREAKER NO-NORMALLY OPEN NC-NORMALLY CLOSED
  - VOLTMETER
  - AMMETER
  - VOLTMETER SWITCH
  - AMMETER SWITCH
  - REMOTE CURRENT ISOLATOR
  - PROTECTIVE RELAY BOARD 2-CR-40 TRANSFORMER 2ST

- NOTES:
- SEE DWG E1-0002 FOR SWGR BUS 2EA1 AND 2EA2
  - TARGET RESET MECHANISM FOR THE RELAY IS REMOVED
  - METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (i.e. V/2ST). FOR THOSE METER/RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER, THE UNDERBAR IS EQUIVALENT TO A SLASH (eg 94-2/2ST IS EQUIVALENT TO 94-2/2ST).

- REFERENCES:
- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
  - E1-0001-A PLANT ONE LINE DIAGRAM UNIT ONE AND COMMON
  - E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0002-A MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E2-0002-A MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
  - E2-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
  - E2-0001-A PLANT ONE LINE DIAGRAM (UNIT 2)
  - E2-0227 345 KV SWITCHYARD RELAY FUNCTIONAL DIAGRAM
  - E2-0212 345 KV SWITCHYARD KEY INTERLOCK SCHEMATIC DIAGRAM

NON-SAFETY

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

MAIN ONE LINE  
METER AND RELAY DIAGRAM



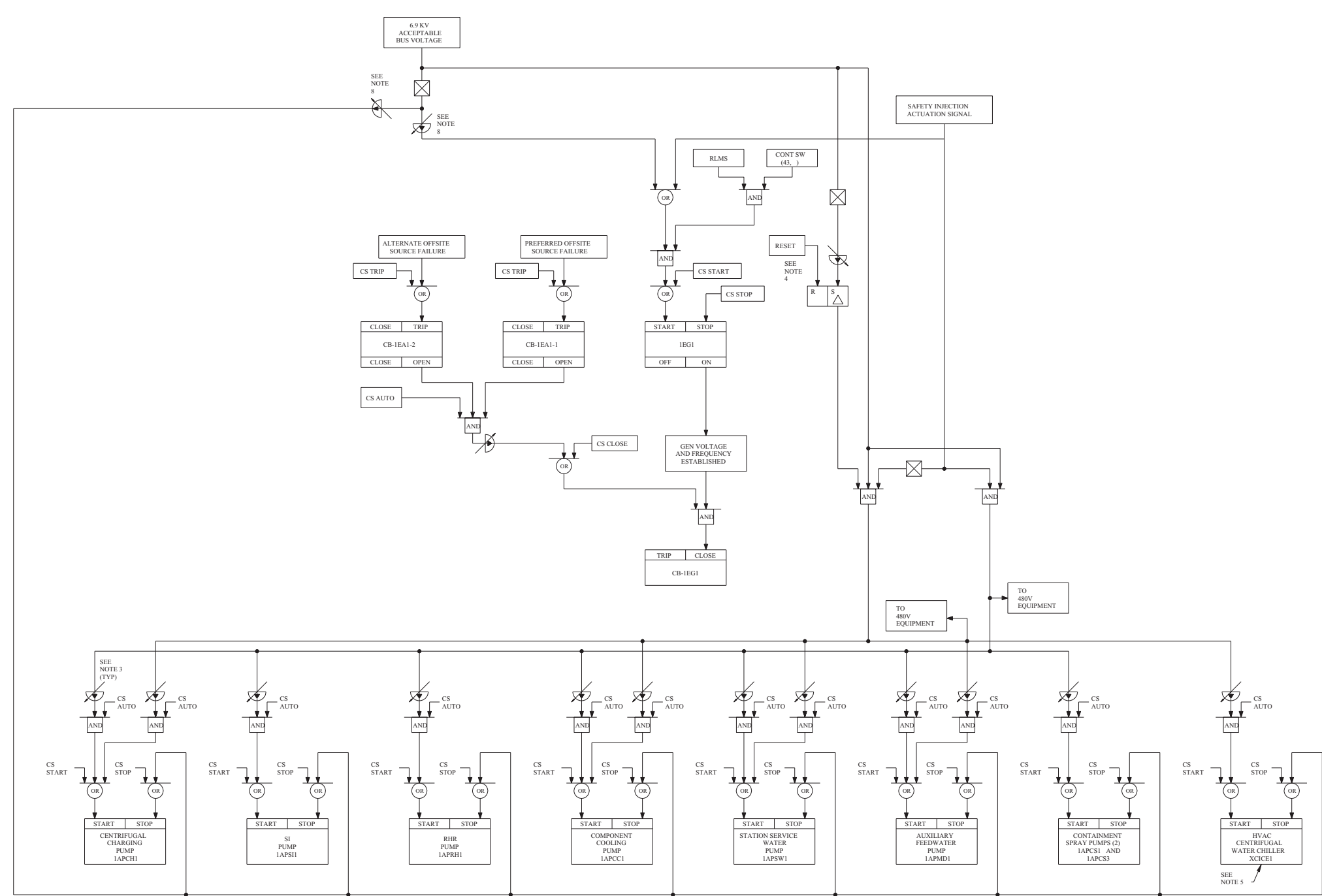
REV	DWN	CHK	APPV	REMARKS
CP-1	12/01/2001	12/02/2001		THIS DRAWING CREATED TO INCORPORATE DESIGN CHANGE FDA-2002-003579-01-00 PER 90-005-02-003579-01-00

FSAR FIGURE 8.3-3

- LEGEND
- AND - INDICATES A DEVICE WHICH PRODUCES AN OUTPUT ONLY WHEN EVERY INPUT IS ENERGIZED
  - OR - INDICATES A DEVICE WHICH PRODUCES AN OUTPUT WHEN ONE INPUT (OR MORE) IS ENERGIZED
  - Time Delay Relay - INDICATES A DEVICE WHICH PRODUCES AN OUTPUT FOLLOWING DEFINITE INTENTIONAL TIME DELAY AFTER RELAY RECEIVING AN INPUT (ADJUSTABLE TIME DELAY RELAY-ENERGIZING)
  - R/S - A DEVICE WHICH RETAINS THE CONDITION OF OUTPUT CORRESPONDING TO THE LAST ENERGIZED INPUT.  $\Delta$  INDICATES THE OUTPUT THAT WILL PREVAIL UNDER SIMULTANEOUS SET AND RESET INPUTS
  - NOT ENERGIZED - INDICATES DEVICE WHICH PRODUCES AN OUTPUT ONLY WHEN THE INPUT IS NOT ENERGIZED

- NOTES
- DIAGRAM SHOWS THE AUTOMATIC SEQUENCE OF THE DIESEL-GENERATOR STARTING AND LOADING SEQUENCE. OTHER FUNCTIONS OPERATING ON THE CIRCUIT BREAKERS SHOWN OR DIESEL START STOP LOGIC ARE OMITTED FOR SIMPLICITY.
  - FOR THE ELECTRICAL ONE LINE DIAGRAMS SEE REF DWG 1 AND 2.
  - FOR SOLID STATE SAFEGUARDS SEQUENCER LOGIC DIAGRAM SEE REF DWG 3.
  - THIS IS RESET AFTER THE SEQUENCER CYCLE IS OVER.
  - HVAC CENTRIFUGAL CHILLERS ARE NON-CLASS 1E.
  - THIS SEQUENCE DIAGRAM IS FOR 1EG1, DIAGRAM FOR 1EG2, 2EG1, AND 2EG2 WILL BE SIMILAR.
  - THIS DIAGRAM DOES NOT SHOW THE LOAD CENTER TRANSFORMERS. THESE TRANSFORMERS ARE ENERGIZED WHEN DG BREAKER CLOSES. THE SEQUENCER DOES NOT SEQUENCE THESE TRANSFORMERS ON TO THE EDG.
  - UPON DETECTION OF DEGRADED BUS STATUS ALL RUNNING MOTORS WILL BE TRIPPED OFF THE BUS AFTER A TIME DELAY AND THE DIESEL ENGINE START SIGNAL IS INITIATED.
  - THE DIESEL GENERATOR STARTING AND LOADING SEQUENCE FOR 1EG1, 2EG1, AND 2EG2 ARE SIMILAR TO 1EG1 SHOWN ON THIS DRAWING.

- REFERENCE DRAWINGS
- E1-0004 6.9KV ONE LINE SAFEGUARD BUS, UNIT 1
  - E1-0005 480V ONE LINE SAFEGUARD BUS, UNIT 1
  - E1-0022-05 SOLID STATE SAFEGUARDS SYSTEM SEQUENCER
  - E1-0030 6.9KV SCHEMATIC DIAGRAMS
  - E1-0031 6.9KV SCHEMATIC DIAGRAMS
  - E1-0033 480V SCHEMATIC DIAGRAMS
  - E1-0067-95 DIESEL GENERATOR SCHEMATIC AND 3-LINE THRU 100 DIAGRAMS



Amendment 104

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1	SEBIMC CATEGORY I
SAFETY CLASS 2	CLASS II
SAFETY CLASS 3	ASSOCIATED CIRCUITS

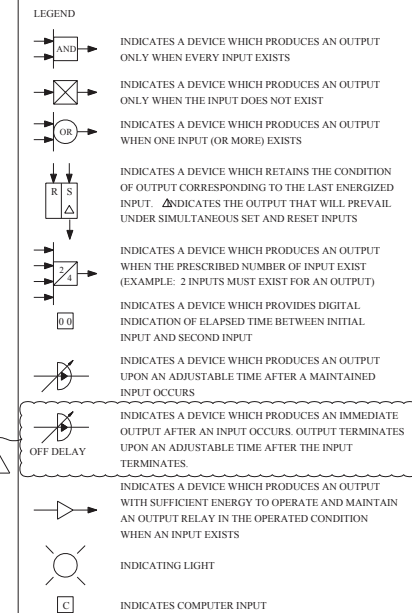
TXU POWER  
CPSES  
GLEN ROSE, TEXAS

DIESEL GENERATOR AUTOMATIC  
STARTING AND LOADING  
SEQUENCE DIAGRAM

DWG NO. E1-0022	SH. NO. 02	REV. CP-1
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**FSAR FIGURE 8.3-4**



- ABBREVIATIONS**
- SIS - SAFETY INJECTION SEQUENCER
  - SIS/AL - SAFETY INJECTION SEQUENCER/AUTO LOCKOUT
  - SIS/OL - SAFETY INJECTION SEQUENCER/OPERATOR LOCKOUT
  - BOS - BLACKOUT SEQUENCER
  - BOS/AL - BLACKOUT SEQUENCER/AUTO LOCKOUT
  - BOS/OL - BLACKOUT SEQUENCER/OPERATOR LOCKOUT

- NOTES**
- BLOCK SWITCHES HAVE MAINTAINED CONTACTS ALL OTHER TEST SWITCHES AND PUSHBUTTONS HAVE MOMENTARY CONTACTS.
  - SIS AND BOS OPERATOR LOCKOUTS SHALL EACH PROVIDE 30 INDEPENDENT CONTACT OPENING OUTPUTS.
  - SAFETY INJECTION SEQUENCER AND BLACKOUT SEQUENCER SHALL EACH PROVIDE (11) ELEVEN INDEPENDENTLY ADJUSTABLE TIME STEPS.
  - ONLY MANUAL TESTING LOGIC IS SHOWN. ADDITIONAL CONTINUOUS AUTOMATIC SIMULATION OF INPUTS AND VERIFICATION OF OUTPUTS OF RELAY DRIVERS INCLUDING VERIFICATION OF TIME SETTINGS SHALL ALSO BE PROVIDED IN SEQUENCER CABINET.
  - SIS AND BOS AUTO LOCKOUTS SHALL EACH PROVIDE (18) EIGHTEEN INDEPENDENT CONTACT OPENING OUTPUTS AND SIS/AL SHALL ALSO PROVIDE (6) SIX CONTACT CLOSING OUTPUTS.
  - SEQUENCER OUTPUT INDICATING LIGHT SHALL BE TURNED ON WHEN ASSOCIATED TIMESTEP OUTPUT SIGNAL IS FIRST PRESENT AND SHALL BE MAINTAINED ON UNTIL SEQUENCER IS RESET.
  - SEQUENCER OUTPUT RELAY INDICATING LIGHTS SHALL BE TURNED ON WHEN ASSOCIATED RELAY IS FIRST ENERGIZED AND REMAIN ON UNTIL RELAY CHANGES STATE.
  - AN ALARM CONTACT SHALL BE PROVIDED TO ACTUATE REMOTE ANNUNCIATOR UPON LOSS OF SUPPLY POWER TO SEQUENCER.
  - THIS SIGNAL RESETS TYPE 1 OUTPUT RELAYS, RESETS AFTER SEQUENCER COMPLETES LAST SIS. ONLY TYPE 2 OUTPUT RELAYS RESET AFTER THE SEQUENCER IS RESET.
  - SOLID STATE SAFEGUARD SEQUENCER LOGIC FOR 1EA2, 2EA1, AND 2EA2 IS SIMILAR TO 1EA1 SHOWN ON THIS DRAWING.

- REFERENCE DRAWINGS**
- E1-0022-04 UNDER/OVER VOLTAGE RELAY PROTECTION FOR CLASS 1E 6.9KV/480V BUSES
  - E2-0022-04 UNDER/OVER VOLTAGE RELAY PROTECTION FOR CLASS 1E 6.9KV/480V BUSES

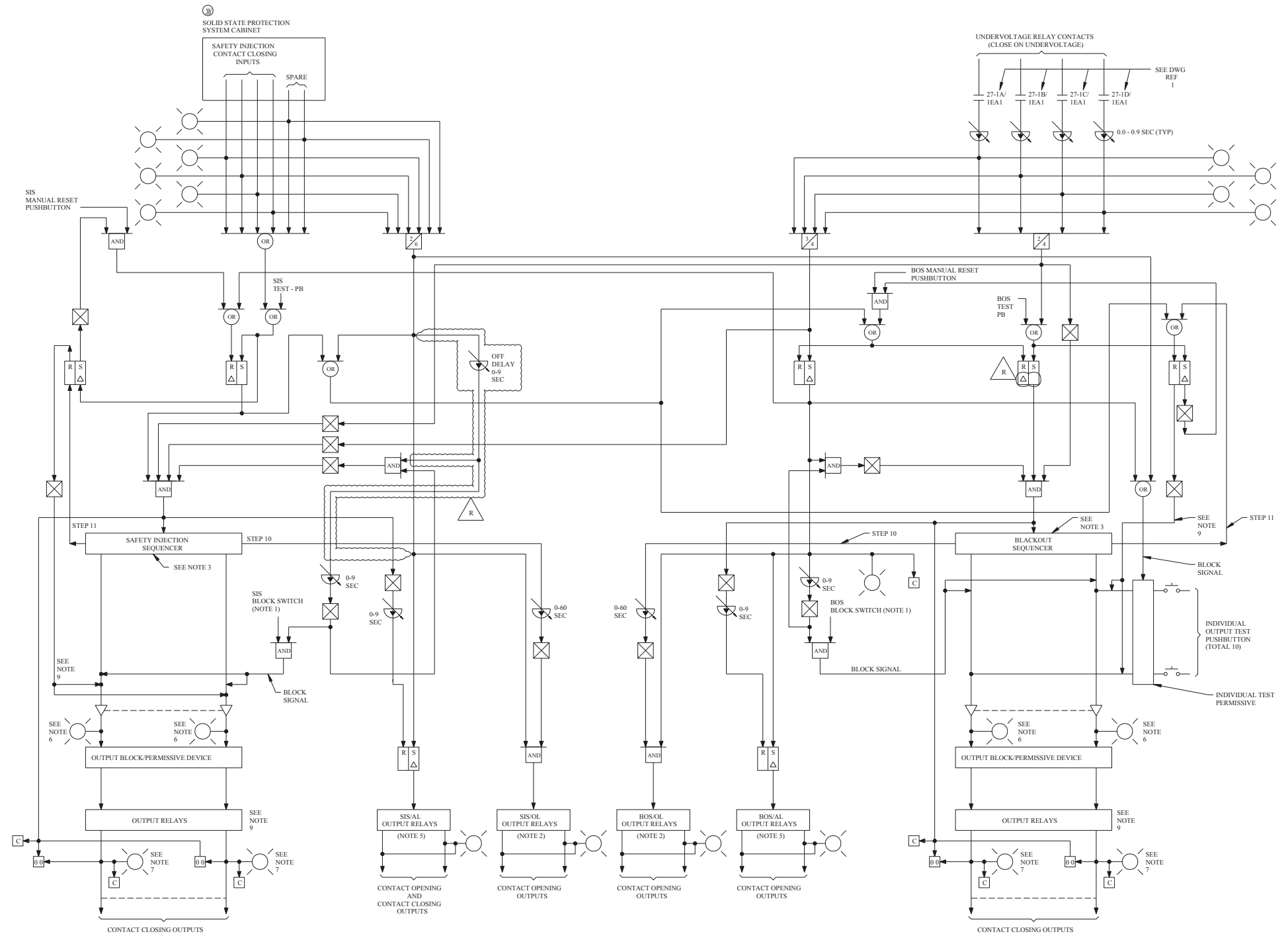
**Amendment 104**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1	SEISMIC CATEGORY I
SAFETY CLASS 2	CLASS 1E
SAFETY CLASS 3	ASSOCIATED CIRCUITS

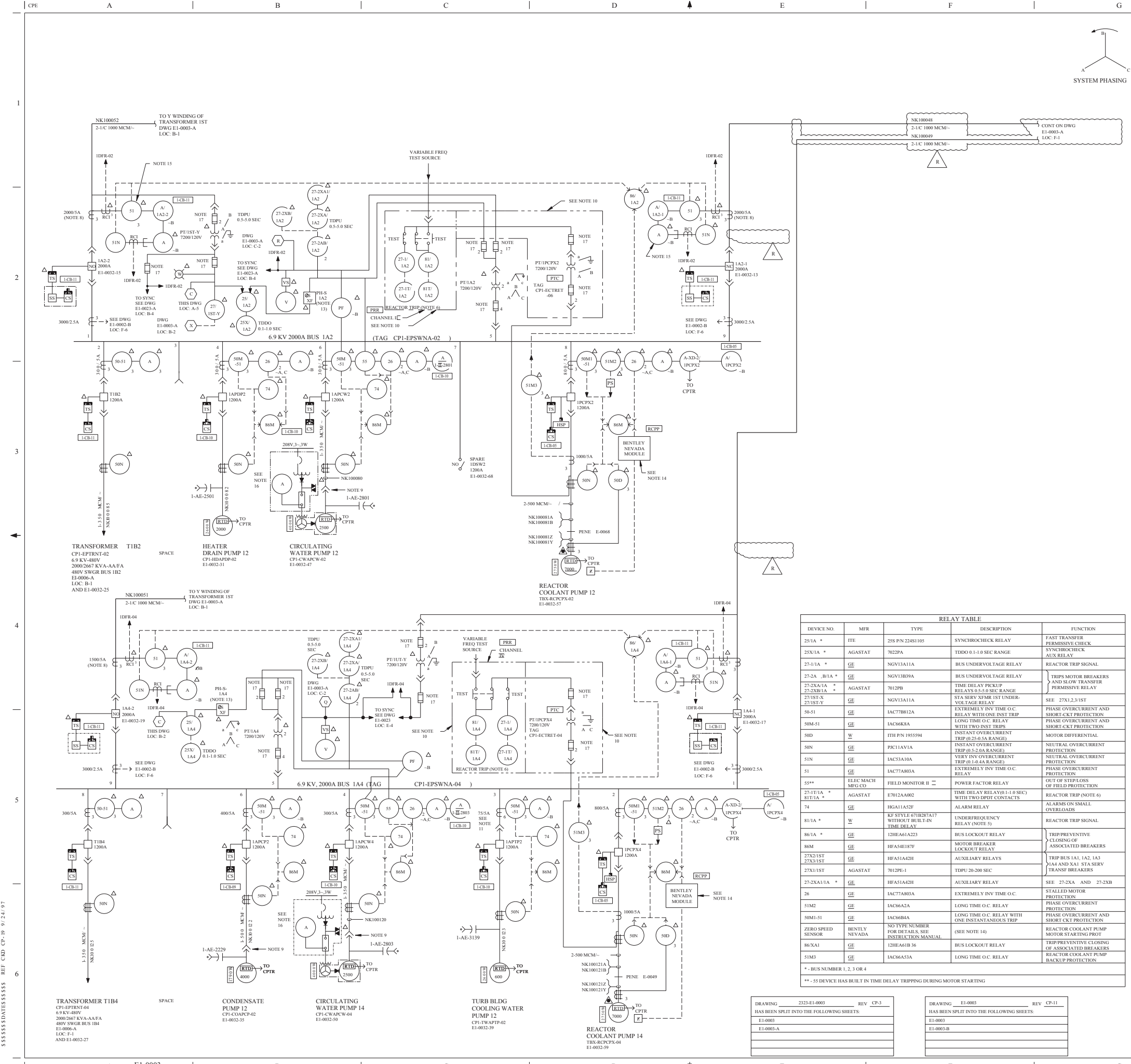
**LUMINANT CPSES**  
GLEN ROSE, TEXAS

**SOLID STATE SAFEGUARD SEQUENCER LOGIC DIAGRAM**



1  
2  
3  
4  
5  
6

THIS DRAWING CREATED ELECTRONICALLY



REV 101 1006 10-17 2004

THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE  
 FDA-2014-00222-02-00 PER SK-0004-14-00222-02-00

### FSAR FIGURE 8.3-5

**LEGEND**

**SYMBOLS:**

- ⊙ LOCATION
- 3 QUANTITY (NO NUMBER INDICATES ONE)
- ⊕ PHASE SHIFTING TRANSFORMER
- SS SYNCHRONIZING SWITCH
- ⊕ PERMISSIVE SWITCH WITH LIGHTS
- ⊕ CONTROL SWITCH WITH LIGHTS
- ⊕ GREEN LIGHT
- ⊕ RED LIGHT
- ⊕ WINDOW OR THRU TYPE CURRENT TRANSFORMER (SEE NOTE 2)
- ⊕ KIRK KEY INTERLOCK WITH THE KEY IN
- ⊕ DISCONNECT SWITCH
- ⊕ PARTIAL DISCHARGE COUPLING CAPACITOR/TEST POINT
- ⊕ SYNCHRONOUS MOTOR WITH BRUSHLESS EXCITER
- ⊕ AUTO TRANSFORMER RECTIFIER
- ⊕ SURGE SUPPRESSOR
- ⊕ TEST TEST PUSH BUTTON, LOCKABLE IN EXTENDED POSITION
- ⊕ MOTOR SPACE HEATER (WATTS LATER)
- ⊕ DRAWNOT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER; CABLE DISCONNECT
- ⊕ SHUNT FOR DC AMMETER

FOR OTHER SYMBOLS SEE DWG E1-0001

**LOCATIONS**

- \* CONTROL ROOM PANEL NUMBER \*
- ⊕ LOCAL NEAR CHILLER
- ⊕ IN 6.9 KV SWITCHGEAR
- ⊕ AT MOTOR
- ⊕ CPTR INDICATES COMPUTER
- ⊕ CLASS 1E PROTECTIVE RELAY RACK
- ⊕ FEEDWATER TURBINE AND REACTOR COOLANT PUMP SUPERVISORY PANEL
- ⊕ POTENTIAL TRANSFORMER CABINET
- ⊕ HOT SHUTDOWN PANEL
- ⊕ REMOTE CURRENT ISOLATOR

**NOTES**

- SWITCHGEAR CLASS: 500 MVA IC
- ALL NEUTRAL OVERCURRENT CT'S ON CABLE FEEDERS ARE TYPE BYZ WITH 50:5A RATIO.
- CT'S SHOWN AT MOTOR ARE GROUNDED SENSORS, BYZ WITH 50:5A RATIO
- QUANTITY, WHERE NOT SHOWN, IS ONE.
- TYPE KF UNDERFREQUENCY RELAY HAS A FREQUENCY RANGE OF 50-59.5HZ.
- PER FUNCTIONAL DIAGRAM DWG 7247D05 SH 5 REACTOR TRIP OCCURS ON SIGNAL FROM TWO OUT OF FOUR BUSES UNDERVOLTAGE OR FREQUENCY.
- CABLE SIZE: WHERE NOT SHOWN IS 40 AWG.
- THESE CT'S SHALL HAVE RELAYING ACCURACY OF 10:400.
- CABLE QUICK DISCONNECT TYPE CONNECTORS ARE PROVIDED FOR VERTICAL MOTORS AND ARE LOCATED IN THE MOTOR TERMINAL BOX.
- PCPMP AND WIRING ENCLOSED INSIDE DASHED LINE IS CLASS 1E ELECTRICAL EQUIPMENT AND WIRING.
- TWO 55A CURRENT TRANSFORMERS ARE CONNECTED IN SERIES TO ACHIEVE 10C50 ACCURACY CLASS.
- DELETED
- PHASE SHIFTING TRANSFORMER OSXF SECONDARY VOLTAGE LAGS PRIMARY VOLTAGE BY 30 DEGREES.
- NEUTRAL OVERCURRENT PROTECTION INCLUDES CIRCUITRY TO PROVIDE STALLED MOTOR/TOO SLOW ACCELERATION PROTECTION.
- METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATIVE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 511A2-1, 511A2-2).
- EXCITER POWER SUPPLY IS LOCATED IN AUXILIARY CUBICLE 5.
- FOR FUSE INFORMATION SEE THREE LINE DIAGRAMS, REF DWG 6.

**REFERENCE DRAWINGS**

- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
- E1-0001-A PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON MAINS ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
- E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
- E1-0002-A MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
- E1-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
- E1-0026-02, 02A 6.9 KV THREE LINE DIAGRAM
- E1-0032-0 NORMAL 6.9 KV SWGR BREAKER SCHEMATICS AND CONNECTION DIAGRAM INDEX

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1  
 SAFETY CLASS 2  
 SAFETY CLASS 3

**LUMINANT CPNPP**  
 GLEN ROSE, TEXAS

**6.9 KV AUXILIARIES**  
 ONE LINE DIAGRAM  
 NORMAL BUSES

DWG NO: E1-0003 SH NO: - REV: CP-30

DEVICE NO.	MFR	TYPE	DESCRIPTION	FUNCTION
25/1A *	ITE	25S P/N 224S1105	SYNCHROCHECK RELAY	FAST TRANSFER PERMISSIVE CHECK
25X/1A *	AGASTAT	7022PA	TDDO 0.1-1.0 SEC RANGE	SYNCHROCHECK AUX RELAY
27-1/1A *	GE	NGV13A11A	BUS UNDERVOLTAGE RELAY	REACTOR TRIP SIGNAL
27-2A, 1B/1A *	GE	NGV13B39A	BUS UNDERVOLTAGE RELAY	TRIPS MOTOR BREAKERS AND SLOW TRANSFER PERMISSIVE RELAY
27-2XA/1A *	AGASTAT	7012PB	TIME DELAY PICKUP RELAYS 0.5-5.0 SEC RANGE	PERMISSIVE RELAY
27-2XB/1A *	AGASTAT	7012PB	TIME DELAY PICKUP RELAYS 0.5-5.0 SEC RANGE	PERMISSIVE RELAY
27-1ST-X	GE	NGV13A11A	STA SERV XFMR 1ST UNDERVOLTAGE RELAY	SEE 27X1.2.3/1ST
50-51	GE	IAC778812A	EXTREMELY INV TIME O.C. RELAY WITH ONE INST TRIP	PHASE OVERCURRENT AND SHORT-CKT PROTECTION
50M-51	GE	IAC66K8A	LONG TIME O.C. RELAY WITH TWO INST TRIPS	PHASE OVERCURRENT AND SHORT-CKT PROTECTION
50D	W	ITH P/N 1955594	INSTANT OVERCURRENT TRIP (0.25-0.5A RANGE)	MOTOR DIFFERENTIAL
50N	GE	PC11A1V1A	NEUTRAL OVERCURRENT PROTECTION (TRIP @ 1.0-4.4 RANGE)	NEUTRAL OVERCURRENT PROTECTION
51	GE	IAC53A10A	VERY INV OVERCURRENT TRIP (0.5-2.0A RANGE)	NEUTRAL OVERCURRENT PROTECTION
51N	GE	IAC77A805A	EXTREMELY INV TIME O.C. RELAY	PHASE OVERCURRENT PROTECTION
55**	ELEC MACH	MFG CO	FIELD MONITOR II	OUT OF STEP LOSS OF FIELD PROTECTION
27-1T/1A *	AGASTAT	E7012A-002	TIME DELAY RELAY(0.1-1.0 SEC) WITH TWO DPDT CONTACTS	REACTOR TRIP (NOTE 6)
81/1A *	W	KF STYLE 67B287A17 WITHOUT BUILT-IN TIME DELAY	UNDERFREQUENCY RELAY (NOTE 5)	REACTOR TRIP SIGNAL
86/1A *	GE	I2HEA61A223	BUS LOCKOUT RELAY	TRIP PREVENTIVE CLOSING OF ASSOCIATED BREAKERS
86M	GE	HFAS4E187F	MOTOR BREAKER LOCKOUT RELAY	TRIP PREVENTIVE CLOSING OF ASSOCIATED BREAKERS
27X2/1ST	GE	HFAS1A42H	AUXILIARY RELAY	TRIP BUS 1A1, 1A2, 1A3
27X1/1ST	AGASTAT	7012PE-1	TDDU 20-200 SEC	TRIP BUS 1A1, 1A2, 1A3
27-2XA1/1A *	GE	HFAS1A42H	AUXILIARY RELAY	TRIP BUS 1A1, 1A2, 1A3
26	GE	IAC77A805A	EXTREMELY INV TIME O.C. RELAY	STALLED MOTOR PROTECTION
51M2	GE	IAC66A2A	LONG TIME O.C. RELAY	PHASE OVERCURRENT PROTECTION
50M1-51	GE	IAC66B4A	LONG TIME O.C. RELAY WITH ONE INSTANTANEOUS TRIP	PHASE OVERCURRENT AND SHORT-CKT PROTECTION
ZERO SPEED SENSOR	BENTLEY NEVADA	NO TYPE NUMBER FOR DETAILS, SEE INSTRUCTION MANUAL (SEE NOTE 14)		REACTOR COOLANT PUMP MOTOR STARTING PROT
86/XA1	GE	I2HEA61B 36	BUS LOCKOUT RELAY	TRIP PREVENTIVE CLOSING OF ASSOCIATED BREAKERS
51M3	GE	IAC66A53A	LONG TIME O.C. RELAY	REACTOR COOLANT PUMP BACKUP PROTECTION

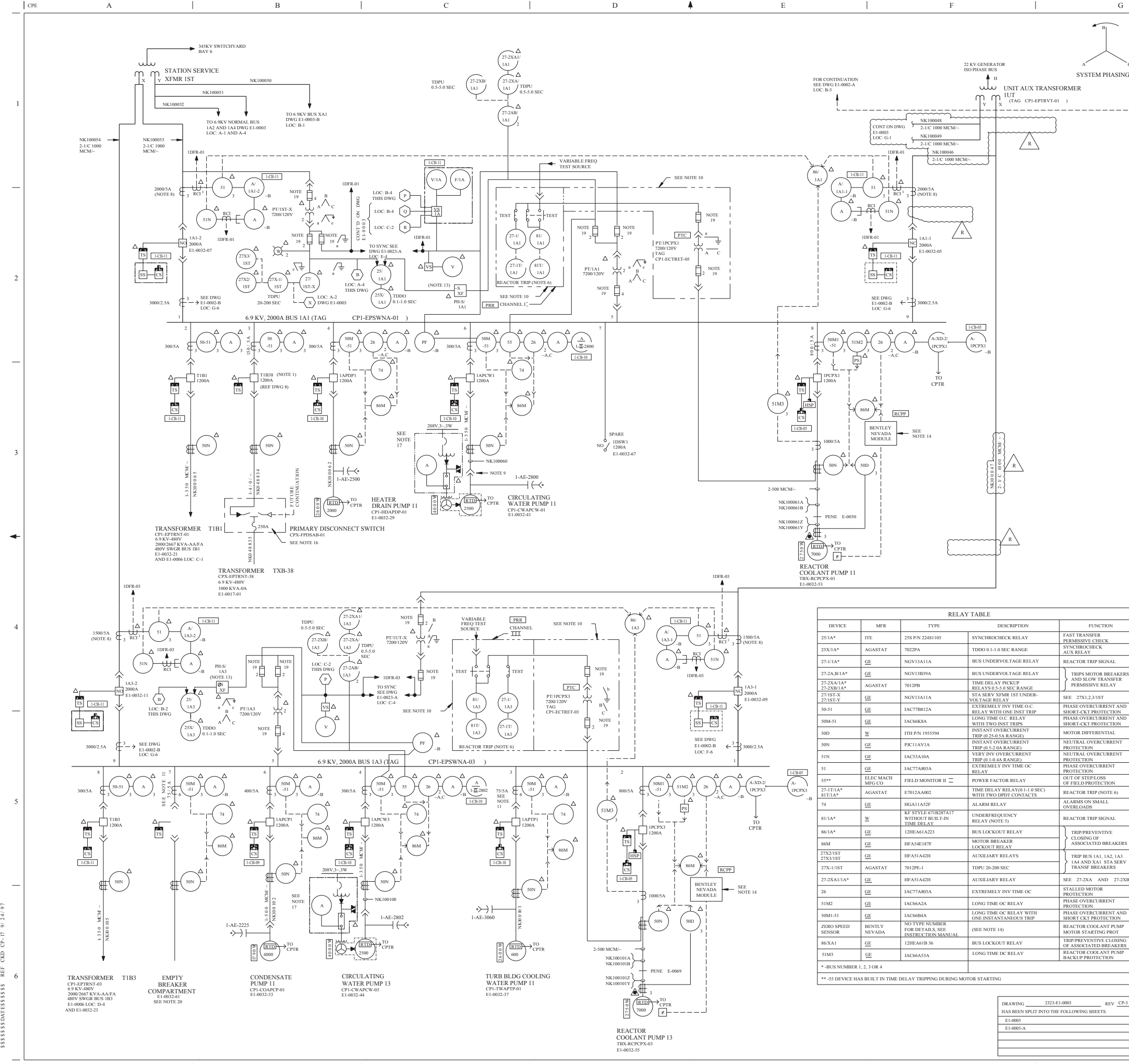
\* - BUS NUMBER 1, 2, 3 OR 4  
 \*\* - 55 DEVICE HAS BUILT IN TIME DELAY TRIPPING DURING MOTOR STARTING

REF CUD CP-19 9/24/97

THIS DRAWING CREATED ELECTRONICALLY

DRAWING 2322-E1-0003 REV CP-3  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
 E1-0003  
 E1-0003-A

DRAWING E1-0003 REV CP-11  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
 E1-0003  
 E1-0003-B



REV	DATE	BY	CHKD	APPV	REMARKS
01	11/01/04	DM	DM	DM	THIS DRAWING REVISYD TO INCORPORATE DESIGN CHANGE FDA-2014-000222-02-00 PER SK-005-14-000222-02-00

### FSAR FIGURE 8.3-5

**LEGEND**

RCT - REMOTE CURRENT ISOLATOR

**SYMBOLS:**

- ⊗ LOCATION
- 3 QUANTITY (NO NUMBER INDICATES ONE)
- ⊗ PHASE SHIFTING TRANSFORMER
- ⊗ SYNCHRONIZING SWITCH
- ⊗ PERMISSIVE SWITCH WITH LIGHTS
- ⊗ CONTROL SWITCH WITH LIGHTS
- ⊗ GREEN LIGHT
- ⊗ RED LIGHT
- ⊗ WINDOW OR THRU TYPE CURRENT TRANSFORMER
- ⊗ DISCONNECT SWITCH
- ⊗ PARTIAL DISCHARGE COUPLING CAPACITOR/TEST POINT
- ⊗ SYNCHRONOUS MOTOR WITH BRUSHLESS EXCITER
- ⊗ EXCITER
- ⊗ AUTO TRANSFORMER RECTIFIER
- ⊗ FIELD EXCITATION SUPPLY FOR SYN MOTOR
- ⊗ SURGE SUPPRESSOR
- ⊗ TEST
- ⊗ MSH
- ⊗ MOTOR SPACE HEATER
- ⊗ DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER, CABLE DISCONNECT
- ⊗ SHUNT FOR DC AMMETER

FOR OTHER SYMBOLS SEE DWG E1-0001

**LOCATIONS**

- \* CONTROL ROOM PANEL NUMBER \*
- △ IN 6.9 KV SWITCHGEAR
- ⊗ AT MOTOR
- ⊗ CPTR INDICATES COMPUTER
- ⊗ PRR CLASS IE PROTECTIVE RELAY RACK 1-CR-11
- ⊗ RCPP FEEDWATER TURBINE AND REACTOR COOLANT PUMP SUPERVISORY PANEL 1-CV-07
- ⊗ PTC POTENTIAL TRANSFORMER CABINET
- ⊗ HSP HOT SHUTDOWN PANEL 1-LV-01

**NOTES**

- SWITCHGEAR CLASS: 500 MVA 1C
- ALL NEUTRAL OVERCURRENT CT'S ON CABLE FEEDERS ARE W TYPE BY 50/5A RATIO
- CT'S SHOWN AT MOTOR ARE W GRADE AND SENSORS, BYZ WITH 50/5A RATIO
- QUANTITY, WHERE NOT SHOWN, IS ONE.
- TYPE KF UNDERFREQUENCY RELAY HAS A FREQUENCY RANGE OF 55-59.5HZ.
- PER SECTIONAL DIAGRAM DWG 724708 SHEET 5 REACTOR TRIP OCCURS ON SIGNAL FROM TWO OUT OF FOUR BUSES UNDERVOLTAGE OR FREQUENCY.
- CABLE SIZE, WHERE NOT SHOWN IS 40 AWG.
- THESE CT'S SHALL HAVE RELAYING ACCURACY OF 10C400.
- CABLE QUICK DISCONNECT TYPE CONNECTORS ARE PROVIDED FOR VERTICAL MOTORS AND ARE LOCATED IN THE MOTOR TERMINAL BOX.
- ⊗ PUMP AND WIRING ENCLOSED INSIDE DASHED LINE IS CLASS IE ELECTRICAL EQUIPMENT AND WIRING.
- TWO 75-A CURRENT TRANSFORMERS ARE CONNECTED IN SERIES TO ACHIEVE 10C30 ACCURACY CLASS.
- KIRK KEY INTERLOCK IS PROVIDED BETWEEN BREAKER XA1-4 AND ELECTRICAL START-UP BOILER HIGH VOLTAGE COMPARTMENT.
- PHASE SHIFTING TRANSFORMER OSXF SECONDARY VOLTAGE LAGS PRIMARY VOLTAGE BY 30 DEGREE.
- BENTLEY NEVADA MODULE INCLUDES CIRCUITRY TO PROVIDE STALLED MOTOR/TORQUE SLOW ACCELERATION PROTECTION.
- METER-RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT'S ASSOCIATED WITH (e.g. 51/IA1-1, 51/IA3-2).
- FUSE SIZE 250 AMPS, WESTINGHOUSE TYPE RBA-RDB-400.
- EXCITER POWER SUPPLY IS LOCATED IN CUBICLE 5.
- DELETED.
- FOR FUSE INFORMATION SEE THREE LINE DIAGRAMS, REF DWG 6.
- BREAKER HAS BEEN PERMANENTLY REMOVED FROM SWITCHGEAR CUBICLE.

**REFERENCES**

- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
- E1-0001-A PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON
- E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
- E1-0002-A MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
- E1-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
- E1-0026-01, 01A 6.9 KV THREE LINE DIAGRAM
- E1-0032-0 NORMAL 6.9KV SWGR BREAKER SCHEMATICS AND CONNECTION DIAGRAM INDEX
- 33-51261-D1543 6.9KV SWGR BUS 1A1 CUB 3 SCHEMATIC WIRING DIAGRAM

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 RELAYED CATEGORY I  
SAFETY CLASS 2 CLASS II ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

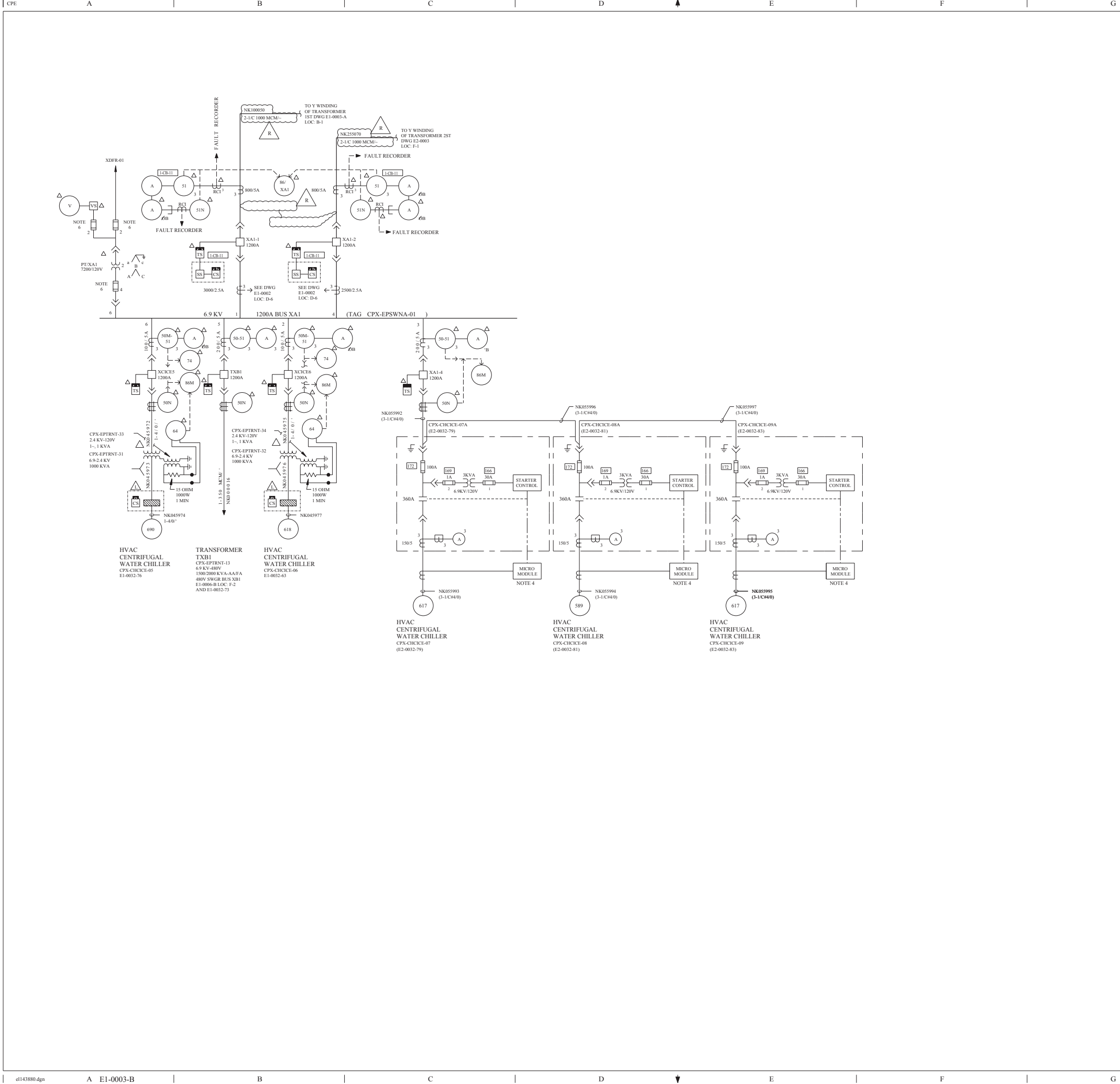
**6.9 KV AUXILIARIES**  
ONE LINE DIAGRAM  
NORMAL BUSES

DWG. NO. E1-0003 SH. NO. A REV. CP-32

DRAWING 2323-E1-0003 REV CP-3  
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
E1-0003-A  
E1-0003-B

\$\$\$\$\$DATE\$\$\$\$\$ REF CKD CP-17 9/24/97

THIS DRAWING CREATED ELECTRONICALLY



REV	DWN	CHK	APP	DATE	REMARKS
28-14	DL	DL	DL	2014	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2014-00022-01-00 PER SK-0003-12-00022-01-00

**FSAR FIGURE 8.3-5**

- LEGEND**
- SYMBOLS-**
- RCT REMOTE CURRENT ISOLATOR
  - △ LOCATION
  - 3 QUANTITY (NO NUMBER INDICATES ONE)
  - SS SYNCHRONIZING SWITCH
  - TS PERMISSIVE SWITCH WITH LIGHTS
  - CS CONTROL SWITCH WITH LIGHTS
  - VS VOLTAGE SWITCH
  - LS LOCAL STARTER
  - W WINDOW OR THRU TYPE CURRENT TRANSFORMER (SEE NOTE 1)
  - ⋈ DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER, CABLE DISCONNECT
  - INDICATES SPLICE
- LOCATIONS**
- △ LOCAL NEAR CHILLER
  - △ IN 6.9 KV SWITCHGEAR
- NOTES**
- ALL NEUTRAL OVERCURRENT CT'S ON CABLE FEEDERS ARE W TYPE BYZ WITH 50:5A RATIO.
  - CT'S SHOWN AT MOTOR ARE W GROUND SENSORS, BYZ WITH 50:5A RATIO.
  - QUANTITY, WHERE NOT SHOWN, IS ONE.
  - MICRO MODULES ARE LOCATED IN THEIR RESPECTIVE CHILLER CONTROL PANELS.
  - METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 51/1A2-1, 51/1A2-2).
  - FOR FUSE INFORMATION SEE THREE LINE DIAGRAM E1-0026-02B.
- REFERENCE DRAWINGS**
- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
  - E1-0001-A PLANT ONE LINE DIAGRAM UNIT ONE AND COMMON
  - E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0002-A MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0024-04 FUSE BILL OF MATERIAL
  - E1-0026-01, 01A, 02, 02A AND 02B 6.9 KV THREE LINE DIAGRAM

- NOTES**
- ALL NEUTRAL OVERCURRENT CT'S ON CABLE FEEDERS ARE W TYPE BYZ WITH 50:5A RATIO.
  - CT'S SHOWN AT MOTOR ARE W GROUND SENSORS, BYZ WITH 50:5A RATIO.
  - QUANTITY, WHERE NOT SHOWN, IS ONE.
  - MICRO MODULES ARE LOCATED IN THEIR RESPECTIVE CHILLER CONTROL PANELS.
  - METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 51/1A2-1, 51/1A2-2).
  - FOR FUSE INFORMATION SEE THREE LINE DIAGRAM E1-0026-02B.

- REFERENCE DRAWINGS**
- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
  - E1-0001-A PLANT ONE LINE DIAGRAM UNIT ONE AND COMMON
  - E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0002-A MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0024-04 FUSE BILL OF MATERIAL
  - E1-0026-01, 01A, 02, 02A AND 02B 6.9 KV THREE LINE DIAGRAM

DRAWING	E1-0003	REV	CP-11
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0003			
E1-0003-B			

**NON-SAFETY**

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

6.9 KV AUXILIARIES  
ONE LINE DIAGRAM  
NORMAL BUSES

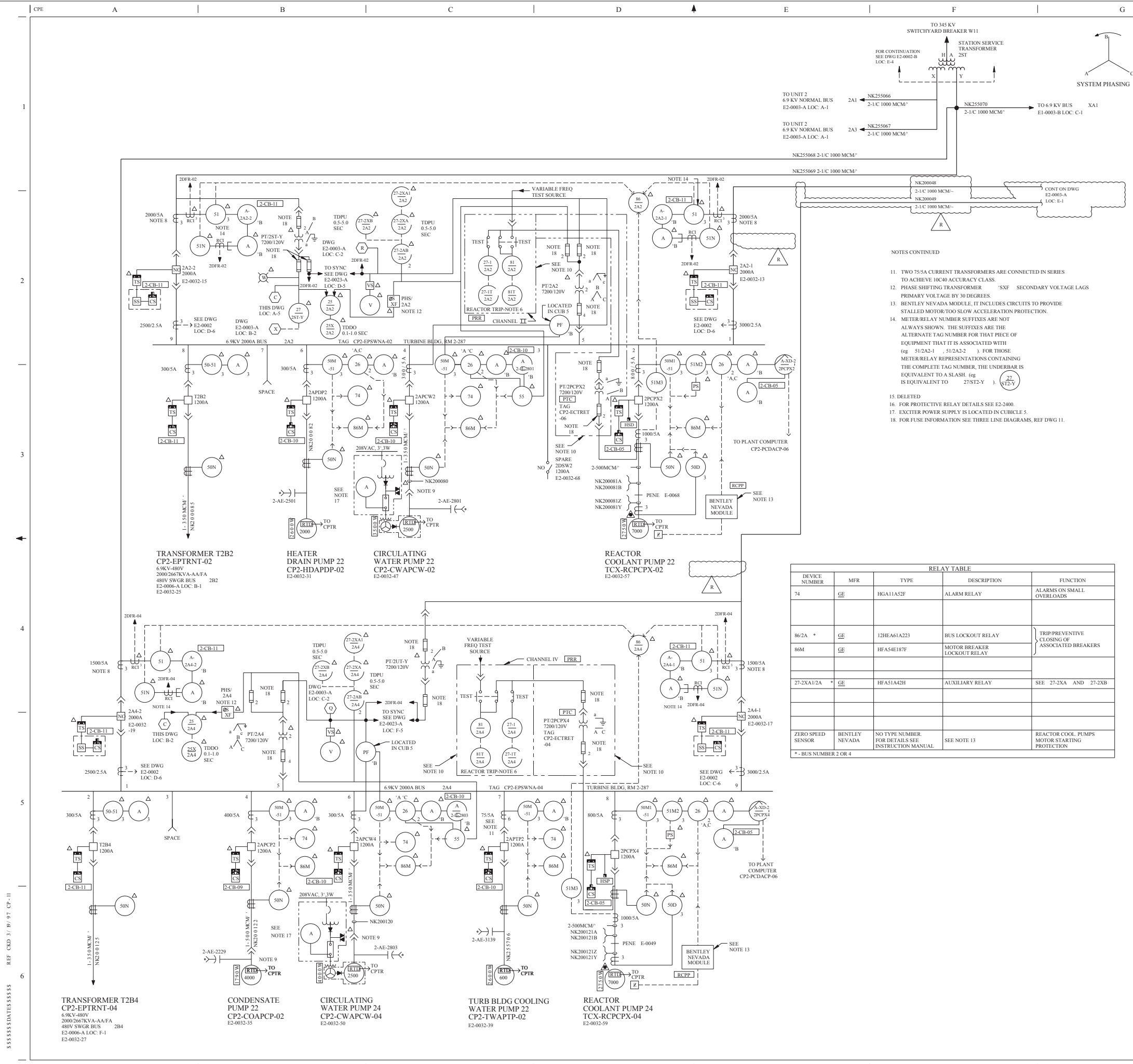
DWG. NO.	E1-0003	SH. NO.	B	REV.	CP-14
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THIS DRAWING CREATED ELECTRONICALLY

\$\$\$\$\$DATE\$\$\$\$\$





REV	DATE	BY	CHKD	APPV	REMARKS
CP-27	11/10/2014				THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDN 2014-000223-02-00 PER SR-0009-14-000223-02-00

**FSAR FIGURE 8.3-5**

- LEGEND**
- RCI - REMOTE CURRENT ISOLATOR
  - LOCATION
  - 51=DEVICE NUMBER, SEE RELAY TABLE
  - A=AMMETER
  - V=VOLTMETER
  - PF=POWER FACTOR METER
  - 3 QUANTITY (NO NUMBER INDICATES ONE)
  - PHASE SHIFTING TRANSFORMER
  - SYNCHRONIZING SWITCH
  - PERMISSIVE SWITCH WITH LIGHTS
  - CONTROL SWITCH WITH LIGHTS
  - GREEN LIGHT
  - RED LIGHT
  - WINDOW OR THRU TYPE CURRENT TRANSFORMER (SEE NOTE 2)
  - DISCONNECT SWITCH
  - PARTIAL DISCHARGE COUPLING CAPACITOR/TEST POINT
  - SYNCHRONOUS MOTOR WITH BRUSHLESS EXCITER
  - AUTO TRANSFORMER RECTIFIER
  - SURGE SUPPRESSOR
  - TEST TEST PUSH BUTTON, LOCKABLE IN EXTENDED POSITION
  - MOTOR SPACE HEATER (\* WATTS)
  - DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER CABLE DISCONNECT
  - SHUNT FOR DC AMMETER
  - PROTECTION SWITCH
  - VOLTMETER SWITCH
  - SPEED PROBE
  - WHITE LIGHT
  - AMBER LIGHT
  - BLUE LIGHT

- NOTES**
- SWITCHGEAR CLASS: 500 MVA IC
  - ALL NEUTRAL OVERCURRENT CT'S ON CABLE FEEDERS ARE WESTINGHOUSE TYPE BYZ WITH 50/5A RATIO
  - CT'S SHOWN AT MOTOR ARE WESTINGHOUSE GROUND SENSORS, BYZ WITH 50/5A RATIO
  - QUANTITY, WHERE NOT SHOWN, IS ONE
  - TYPE KF UNDERFREQUENCY RELAY HAS A FREQUENCY RANGE OF 55-59.5 HZ
  - PER WESTINGHOUSE FUNCTIONAL DIAGRAM DWG 7247D05 SH 5 REACTOR TRIP OCCURS ON SIGNAL FROM TWO OUT OF FOUR BUSES UNDERVOLTAGE OR FREQUENCY
  - CABLE SIZE WHERE NOT SHOWN IS 40 AWG
  - THESE CT'S SHALL HAVE RELAYING ACCURACY OF 10C400
  - CABLE QUICK DISCONNECT TYPE CONNECTORS ARE PROVIDED FOR VERTICAL MOTORS AND ARE LOCATED IN THE MOTOR TERMINAL BOX
  - EQUIPMENT AND WIRING ENCLOSED INSIDE DASHED LINE IS CLASS IE ELECTRICAL EQUIPMENT AND WIRING

- REFERENCE DRAWINGS**
- EI-0001 PLANT ONE DIAGRAM (UNITS 1 AND 2)
  - EI-0002, 0002A, 0002B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - EI-0004, -0004A, -0004B 6.9KV ONE LINE SAFEGUARD BUSES (UNIT 1)
  - E2-0006, 0006-A 480V ONE LINE DIAGRAM NORMAL BUSES (UNIT 2)
  - E2-0002-A, 0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
  - EI-0003, -0003A 6.9KV ONE LINE NORMAL BUSES (UNIT 1)
  - E2-0004, 0004-A 6.9KV ONE LINE SAFEGUARD BUSES (UNIT 2)
  - EI-0023, -0023A, -0023B PHASING AND SYNCHRONIZING DIAGRAM (UNIT 1)
  - E2-0023, 0023-A, 0023-B PHASING AND SYNCHRONIZING DIAGRAM (UNIT 2)
  - EI-0026-01, 02, 02A 6.9KV THREE LINE DIAGRAM (UNIT 1)
  - E2-0026-01, 01A, 02, 02A 6.9KV THREE LINE DIAGRAM (UNIT 2)
  - E2-0032 (SERIES) SCHEMATIC DRAWINGS
  - E2-2400-81 PROTECTIVE DEVICE SETTING SYSTEM INDEX

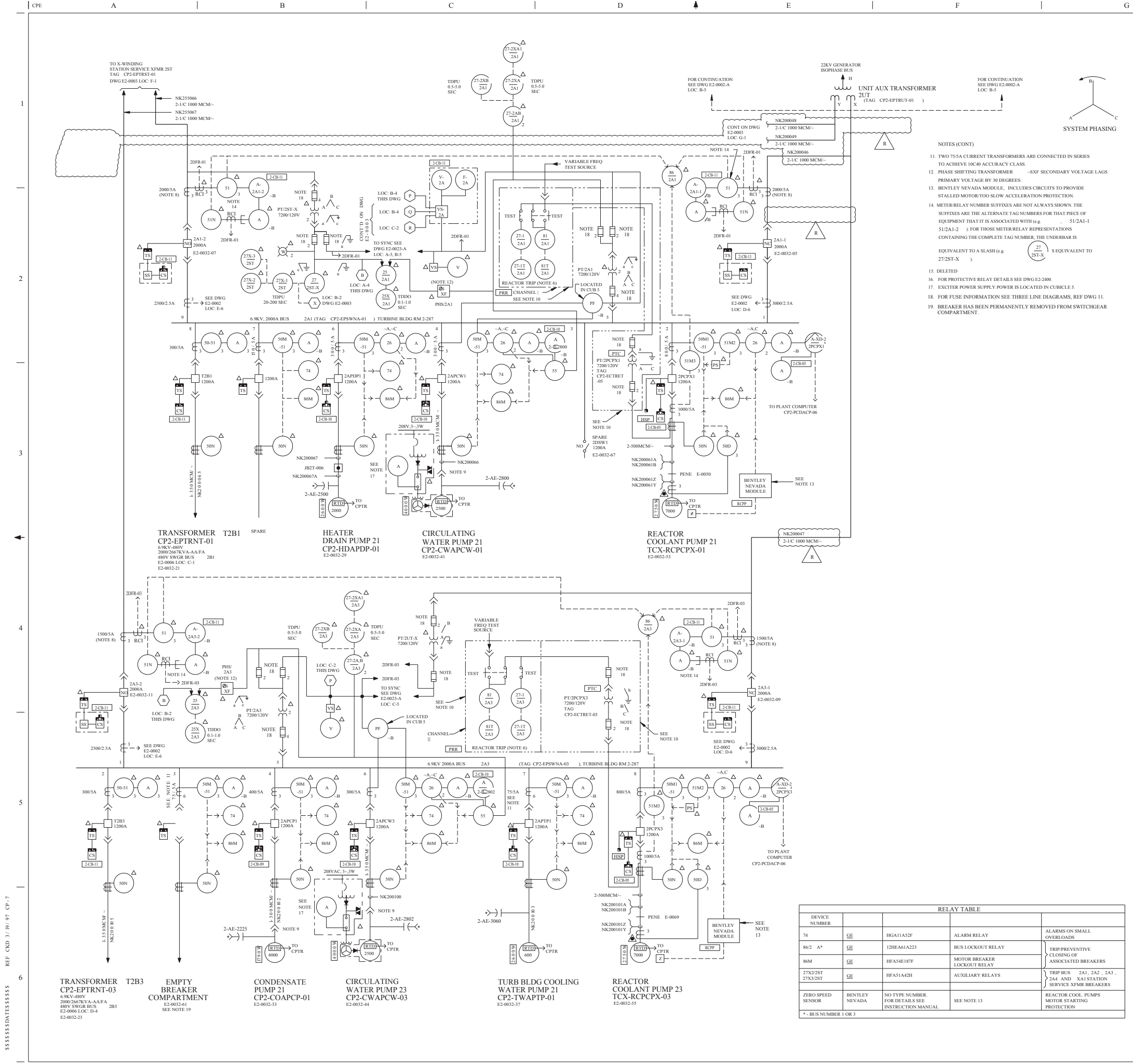
DWG NO	2323-E2-0003	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0003			
E2-0003-A			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY 1  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT CPNPP**  
GLEN ROSE, TEXAS

**6.9 KV AUXILIARIES ONE LINE DIAGRAM NORMAL BUSES**

REF: CKD 3 / B / 97 / CP-11



REV	DATE	BY	CHKD	APPV	REMARKS
CP-24	01/11/2004	01/11/2004			THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE: FDA-2014-000222-02-50 PER SK-0010-14-000222-02-50.

**FSAR FIGURE 8.3-5**

- LEGEND:**
- SYMBOLS:**
- △ LOCATION
  - SI - DEVICE NUMBER, SEE RELAY TABLE
  - A - AMMETER
  - V - VOLTMETER
  - PF - POWER FACTOR METER
  - 3 QUANTITY (NO NUMBER INDICATES ONE)
- PHASE SHIFTING TRANSFORMER**
- PS - PHASE SHIFTING TRANSFORMER
  - SS - SYNCHRONIZING SWITCH
  - TS - PERMISSIVE SWITCH WITH LIGHTS
  - CS - CONTROL SWITCH WITH LIGHTS
  - GS - GREEN LIGHT
  - RS - RED LIGHT
  - WS - WINDOW OR THRU-TYPE CURRENT TRANSFORMER (SEE NOTE 2)
  - DS - DISCONNECT SWITCH
  - PCS - PARTIAL DISCHARGE COUPLING CAPACITOR/TEST POINT
- PROTECTION SWITCH**
- PS - PROTECTION SWITCH
  - VS - VOLTMETER SWITCH
  - Z - SPEED PROBE
  - WL - WHITE LIGHT
  - AL - AMBER LIGHT
  - BL - BLUE LIGHT
- EXCITER**
- EX - SYNCHRONOUS MOTOR WITH BRUSHLESS EXCITER
  - EX - AUTO TRANSFORMER RECTIFIER SUPPLY FOR SYN MOTOR
  - EX - SURGE SUPPRESSOR
  - EX - TEST PUSH BUTTON, LOCKABLE IN EXTENDED POSITION
  - EX - MOTOR SPACE HEATER (\* WATTS)
  - EX - DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER, CABLE DISCONNECT
  - EX - SHUNT FOR DC AMMETER
- FOR OTHER SYMBOLS SEE DWG E1-0001**
- \* - CONTROL ROOM PANEL NUMBER \*
  - △ - IN 6.9KV SWITCHGEAR
  - △ - AT MOTOR
  - CPTR - INDICATES COMPUTER
  - PRR - CLASS 1E PROTECTIVE RELAY RACK 2-CR-11
  - RCP - FEEDWATER TURBINE AND REACTOR COOLANT PUMP SUPERVISORY PANEL 2-CV-07
  - PTC - POTENTIAL TRANSFORMER CABINET
  - HSP - HOT SHUTDOWN PANEL 2-VL-01
  - F - FUSE
  - 2 - NUMBER OF FUSES-NO NUMBER MEANS (1) FUSE
  - - SPLICE

- NOTES (CONT)**
- TWO 755A CURRENT TRANSFORMERS ARE CONNECTED IN SERIES TO ACHIEVE 10C40 ACCURACY CLASS.
  - PHASE SHIFTING TRANSFORMER - SXF SECONDARY VOLTAGE LAGS PRIMARY VOLTAGE BY 30 DEGREES.
  - BENTLEY NEVADA MODULE, INCLUDES CIRCUITS TO PROVIDE STALLED MOTOR/TWO SLOW ACCELERATION PROTECTION.
  - METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBERS FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. S1/2A1-1 S1/2A1-2 ) FOR METER/RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER, THE UNDERBAR IS EQUIVALENT TO A SLASH (e.g. 27/2ST-X IS EQUIVALENT TO 27/2ST-X ).
  - DELETED
  - FOR PROTECTIVE RELAY DETAILS SEE DWG E2-2400.
  - EXCITER POWER SUPPLY POWER IS LOCATED IN CUBICLE 5.
  - FOR FUSE INFORMATION SEE THREE LINE DIAGRAMS, REF DWG 11.
  - BREAKER HAS BEEN PERMANENTLY REMOVED FROM SWITCHGEAR COMPARTMENT.

- NOTES**
- SWITCHGEAR CLASS: 500 MVA IC
  - ALL NEUTRAL OVERCURRENT CT'S ON CABLE FEEDERS ARE WESTINGHOUSE TYPE BYZ WITH 50:5A RATIO
  - CT'S SHOWN AT MOTOR ARE WESTINGHOUSE GROUND SENSORS, BYZ WITH 50:5A RATIO
  - QUANTITY, WHERE NOT SHOWN, IS ONE
  - TYPE KF UNDERFREQUENCY RELAY HAS A FREQUENCY RANGE OF 55-59.5 HZ
  - PER WESTINGHOUSE FUNCTIONAL DIAGRAM DWG 7247D05 SH 5 REACTOR TRIP OCCURS ON SIGNAL FROM TWO OUT OF FOUR BUSES UNDERVOLTAGE OR FREQUENCY
  - CABLE SIZE WHERE NOT SHOWN IS 4.0 AWG
  - THESE CT'S SHALL HAVE RELAYING ACCURACY OF 10C400
  - CABLE QUICK DISCONNECT TYPE CONNECTORS ARE PROVIDED FOR VERTICAL MOTORS AND ARE LOCATED IN THE MOTOR TERMINAL BOX
  - EQUIPMENT AND WIRING ENCLOSED INSIDE DASHED LINE IS CLASS 1E ELECTRICAL EQUIPMENT AND WIRING

- REFERENCE DRAWINGS**
- E1-0001 PLANT ONE DIAGRAM (UNITS 1 AND 2)
  - E1-0002, 0002-A, 0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1)
  - E1-0004, 0004-A, 0004-B 6.9KV ONE LINE SAFEGUARD BUSES (UNIT 1)
  - E2-0006, 0006-A 480V ONE LINE DIAGRAM NORMAL BUSES (UNIT 2)
  - E2-0002-A, 0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
  - E1-0003, 0003-A 6.9KV ONE LINE NORMAL BUSES (UNIT 1)
  - E2-0004, 0004-A 6.9KV ONE LINE SAFEGUARD BUSES (UNIT 2)
  - E1-0023, 0023-A, 0023-B PHASING AND SYNCHRONIZING DIAGRAM (UNIT 1)
  - E2-0023, 0023-A, 0023-B PHASING AND SYNCHRONIZING DIAGRAM (UNIT 2)
  - E1-0026-01, 01A, 02, 02A 6.9KV THREE LINE DIAGRAM (UNIT 1)
  - E2-0026-01, 01A, 02, 02A 6.9KV THREE LINE DIAGRAM (UNIT 2)
  - E2-0032 (SERIES) SCHEMATIC DRAWINGS
  - E2-2400-81 PROTECTIVE DEVICE SETTING SYSTEM INDEX

RELAY TABLE				
DEVICE NUMBER	GE	DESCRIPTION	FUNCTION	REMARKS
74	GE	HGA11A52F	ALARM RELAY	ALARMS ON SMALL OVERLOADS
862 A*	GE	12HEA61A223	BUS LOCKOUT RELAY	TRIP PREVENTIVE CLOSING OF ASSOCIATED BREAKERS
86M	GE	HFAS4E187F	MOTOR BREAKER LOCKOUT RELAY	TRIP BUS 2A1, 2A2, 2A3, 2A4 AND 2A1 STATION SERVICE XFMR BREAKERS
27X2/2ST 27X3/2ST	GE	HFAS1A42H	AUXILIARY RELAYS	REACTOR COOL. PUMPS MOTOR STARTING PROTECTION
ZERO SPEED SENSOR	BENTLEY NEVADA	NO TYPE NUMBER FOR DETAILS SEE INSTRUCTION MANUAL	SEE NOTE 13	

\* - BUS NUMBER 1 OR 3

DRAWING 2323-E2-0003 REV CP-2  
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
E2-0003  
E2-0003-A

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEVERE CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

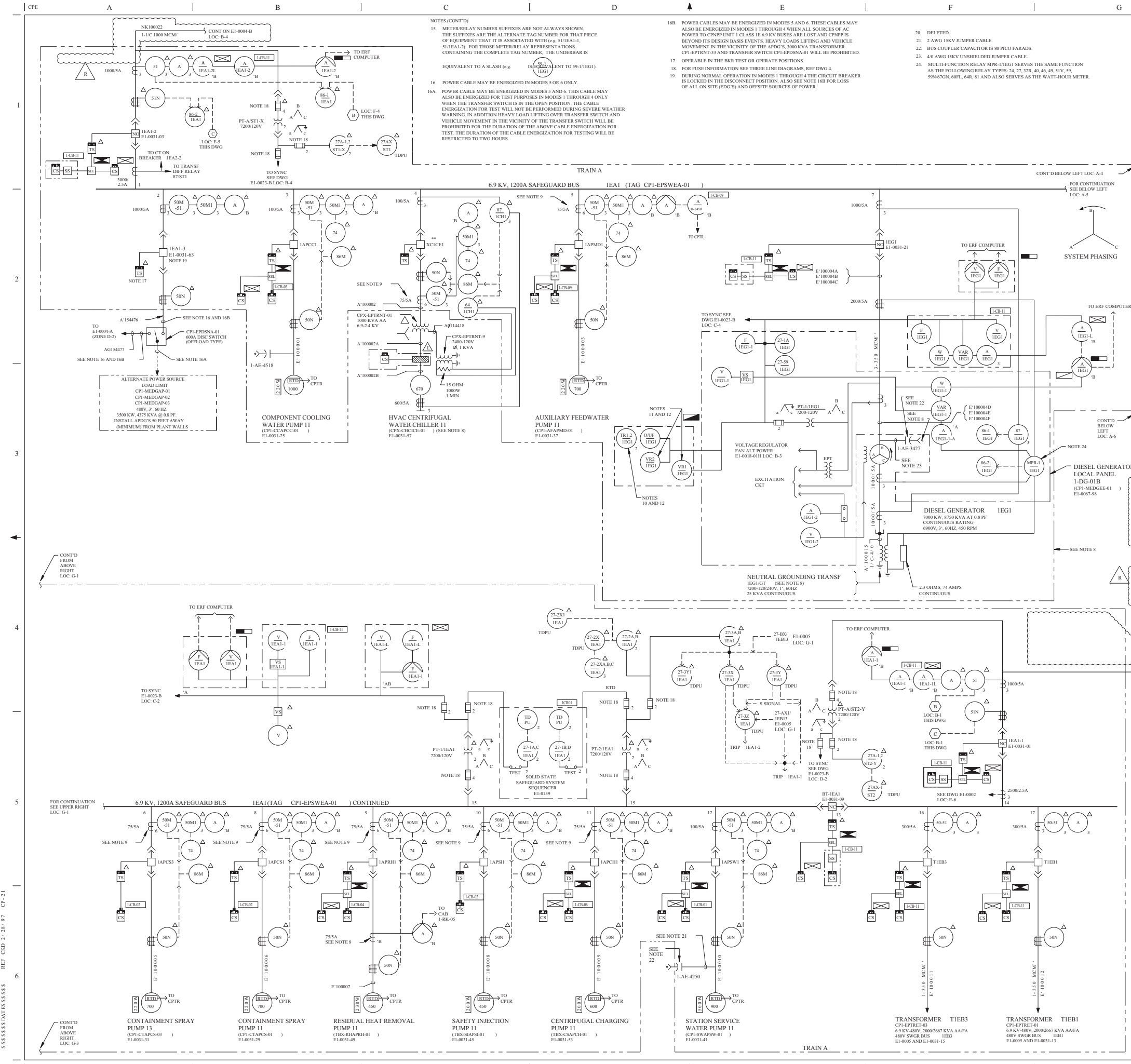
**LUMINANT CPNPP**  
**GLEN ROSE, TEXAS**

**6.9 KV AUXILIARIES ONE LINE DIAGRAM NORMAL BUSES**

DWG NO: E2-0003 SHE NO: A REV: CP-24

REF CKD 3/19/97 CP-7  
\$\$\$\$\$DATES\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY



REV	CHKD	APTD	REMARKS
7-00	10-11	10-11	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FROM 2004-0001-00-00 FOR 2004-10-0001-00-00.

**FSAR FIGURE 8.3-6**

**LEGEND**

- △ LOCATION
- 3 QUANTITY (NO NUMBER INDICATES ONE)
- CS CONTROL SWITCH WITH LIGHTS
- TS PERMISSIVE SWITCH WITH LIGHTS
- GREEN LIGHT □ WHITE LIGHT □ AMBER LIGHT □ BLUE LIGHT
- VS VOLT/METER SWITCH
- SS SELECTOR SWITCH
- SS SYNCHRONIZING SWITCH
- CIRCUIT BREAKER
- WINDOW OR THRU TYPE CURRENT TRANSFORMER, SEE NOTE 2
- DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER
- LOCAL STARTER
- MOTOR SPACE HEATER (500 WATTS)
- DC SHUNT 400A 50mV
- TRANSDUCER (XD)
- LR LINEAR REACTOR RESISTANCE=0015 OHM HEAVY 164W MAX 310 AMPS
- THYRISTOR SCR
- GB GOVERNOR RESISTOR BOX
- EPT EXCITER POWER TRANSFORMER 3" 153 KVA 6900V (383Y)-284.3V (164Y) (FOR OTHER SYMBOLS SEE DWG E1-0001)

**LOCATIONS**

- \* CONTROL ROOM PANEL NUMBER \*
- DIESEL GENERATOR-LOCAL GENERATOR PANEL
- DIESEL GENERATOR-LOCAL ENGINE PANEL
- HOT SHUTDOWN PANEL (HSP)
- SHUTDOWN TRANSFER PANEL (STP)
- ERF TRANSDUCER PANEL CP1-EPTRV-16
- 6900V SWITCHGEAR
- △ LOCAL NEAR CHILLER
- CPTR INDICATES COMPUTER
- BUS COUPLER CAPACITOR/TEST POINT FOR PARTIAL DISCHARGE MONITORING

**NOTES**

- SWITCHGEAR CLASS 500 MVA IC ALL BREAKERS ARE 1200A.
- GROUND SENSOR (ITE TYPE G85) TO BE USED WITH GROUND OVERCURRENT RELAYS 50N AND 51N, 5-50 PRIMARY RANGE.
- CABLE SIZE, WHERE NOT SHOWN, IS 40 AWG.
- QUANTITY, WHERE NOT SHOWN, IS ONE (1).
- ISOLATION BETWEEN CLASS IE BUS AND NON-CLASS IE LOAD IS PROVIDED BY THE LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKERS, INDICATED BY \*\* NEXT TO THE LOAD CIRCUIT BREAKER, AND THE BREAKER TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL.
- DELETED
- DELETED
- EQUIPMENT ENCLOSED INSIDE DASHED LINE IS CLASS IE ELECTRICAL EQUIPMENT EXCEPT THE FOLLOWING: GROUNDING TRANSFORMER DG IEG1 IS NON-CLASS IE. POWER CABLING FOR HVAC CENTRIFUGAL WATER CHILLER 11 IS ASSOCIATED CLASS IE, TRAIN A. ALSO, ON THE LOAD SIDE OF BKR IAPRH1, THE 75.5A CT'S SECONDARY IS NON CLASS IE, MPR-1 IEG1.
- TEST POINT FOR PARTIAL DISCHARGE MONITORING.
- TWO 75.5A CURRENT TRANSFORMERS ARE CONNECTED IN SERIES TO ACHIEVE THE REQUIRED ACCURACY.
- TACHOMETER RELAY SET AT APP. 94.5% SPEED.
- UNDERVOLTAGE 3 PHASE RELAY WILMAR MODEL 401-45, RANGE 85-120, SET AT 103.5 (90% RATED) VOLTS.
- GENERATOR BREAKER CLOSING PERMITTED WHEN VOLTAGE AND SPEED ABOVE THE SET VALUES.
- FOR RELAY TABLE DATA, SEE DWG E1-0004-B.
- MOTOR SPACE HEATERS ARE NON-CLASS IE.

**REFERENCE DRAWINGS**

- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
- E1-0001-A PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON
- E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAMS
- E1-0027-01, 01A 6.9 KV THREE LINE DIAGRAMS SAFEGUARD 6.9 KV SWGR BKR SCHEMATICS AND CONNECTION DIAGRAM INDEX
- E1-0031-0

DRAWING 2123-E1-0004 REV CP-5  
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
E1-0004  
E1-0004-A  
E1-0004-B

**TRAIN A**  
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

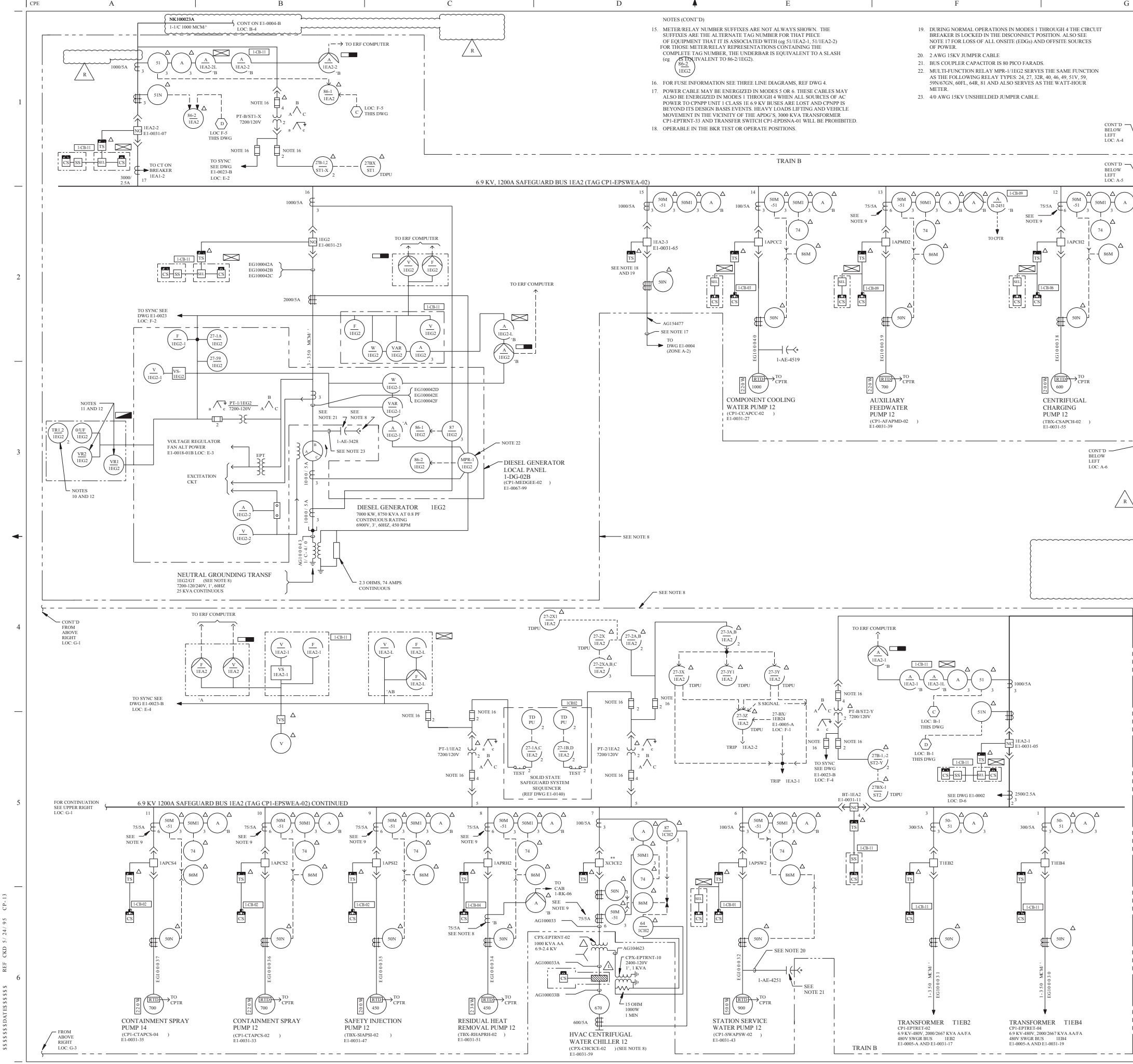
**6.9 KV AUXILIARIES**  
**ONE LINE DIAGRAM**  
**SAFEGUARD BUSES**

DWG NO: E1-0004 SH. NO. - REV. CP-40

REF CKD 2/26/97 CP-21

THIS DRAWING CREATED ELECTRONICALLY





NOTES (CONT'D)

- METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (eg 51/IEA2-1, 51/IEA2-2) FOR THOSE METER/RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER, THE UNDERBAR IS EQUIVALENT TO A SLASH (eg 86-2/IEA2).
- FOR FUSE INFORMATION SEE THREE LINE DIAGRAMS, REF DWG 4.
- POWER CABLE MAY BE ENERGIZED IN MODES 5 OR 6. THESE CABLES MAY ALSO BE ENERGIZED IN MODES 1 THROUGH 4 WHEN ALL SOURCES OF AC POWER TO CPNPP UNIT 1 CLASS 1E 6.9 KV BUSES ARE LOST AND CPNPP IS BEYOND ITS DESIGN BASIS EVENTS. HEAVY LOADS LIFTING AND VEHICLE MOVEMENT IN THE VICINITY OF THE APD'S, 3000 KVA TRANSFORMER CP1-EPRINT-33 AND TRANSFER SWITCH CP1-EPSWA-01 WILL BE PROHIBITED.
- OPERABLE IN THE BKR TEST OR OPERATE POSITIONS.

- DURING NORMAL OPERATIONS IN MODES 1 THROUGH 4 THE CIRCUIT BREAKER IS LOCKED IN THE DISCONNECT POSITION. ALSO SEE NOTE 17 FOR LOSS OF ALL ONSITE (EDGS) AND OFFSITE SOURCES OF POWER.
- 2 AWG 15KV JUMPER CABLE.
- BUS COUPLER CAPACITOR IS 80 PICO FARADS.
- MULTI-FUNCTION RELAY MPR-1/IEG2 SERVES THE SAME FUNCTION AS THE FOLLOWING RELAY TYPES: 24, 27, 32R, 40, 46, 49, 51V, 59N/67GN, 60L, 64R, 81 AND ALSO SERVES AS THE WATT-HOUR METER.
- 4/0 AWG 15KV UNSHELD JUMPER CABLE.

REV	DATE	BY	CHKD	APPV	REMARKS
23-31	08/20/2014	...	...	...	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2014-000222-02-00 PER SK-0007-14-000222-02-00

**FSAR FIGURE 8.3-6**

**LEGEND**

- LOCATION
- QUANTITY (NO NUMBER INDICATES ONE)
- CONTROL SWITCH WITH LIGHTS
- PERMISSIVE SWITCH WITH LIGHTS
- GREEN LIGHT
- WHITE LIGHT
- RED LIGHT
- AMBER LIGHT
- BLUE LIGHT
- VOLTMETER SWITCH
- SELECTOR SWITCH
- SYNCHRONIZING SWITCH
- WINDOW OR THRU TYPE CURRENT TRANSFORMER, SEE NOTE 2
- DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER
- LOCAL STARTER
- MOTOR SPACE HEATER (500 WATTS)
- DC SHUNT 400A 50mV
- TRANSDUCER (XD)
- LINEAR REACTOR RESISTANCE-0015 OHM HEAVY 164V MAX 310 AMPS
- THYRISTOR SCR
- GOVERNOR RESISTOR BOX
- EXCITER POWER TRANSFORMER 3" 153 KVA 6900V (983Y)-284.3V (164Y) (FOR OTHER SYMBOLS SEE DWG E1-0001)

**LOCATIONS**

- CONTROL ROOM PANEL NUMBER
- DIESEL GENERATOR - LOCAL ENGINE PANEL
- HOT SHUTDOWN PANEL (HSP)
- DIESEL GENERATOR - LOCAL GENERATOR PANEL
- ERF TRANSDUCER PANEL CP1-ECPRV-17
- 6900V SWITCHGEAR
- LOCAL NEAR CHILLER
- INDICATES COMPUTER
- CIRCUIT BREAKER
- PARTIAL DISCHARGE COUPLING CAPACITOR/TEST POINT

**NOTES**

- SWITCHGEAR CLASS 500 MVA IC. ALL BREAKERS ARE 1200A.
- GROUND SENSOR (ITE TYPE G55) TO BE USED WITH GROUND OVERCURRENT RELAYS 50N AND 51N, 5-50A PRIMARY RANGE.
- CABLE SIZE, WHERE NOT SHOWN, IS 4/0 AWG.
- QUANTITY, WHERE NOT SHOWN, IS ONE (1).
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY THE LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKERS, INDICATED BY "NEXT" TO THE LOAD CIRCUIT BREAKER, AND THE BREAKER TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL.
- DELETED
- DELETED
- EQUIPMENT ENCLOSED INSIDE DASHED LINE IS CLASS 1E ELECTRICAL EQUIPMENT EXCEPT THE FOLLOWING: GROUNDING TRANSFORMER FOR DG 1EG2 IS NON-CLASS 1E. POWER CABLE FOR HVAC CENTRIFUGAL WATER CHILLER 12 IS ASSOCIATED CLASS 1E. TRAIN BB, ALSO ON THE LOAD SIDE OF BKR 1APR12, THE "B" 75.5A CT'S SECONDARY IS NON CLASS 1E. MPR-1/IEG2 TEST POINT FOR PARTIAL DISCHARGE MONITORING.
- TWO 75.5A CURRENT TRANSFORMERS ARE CONNECTED IN SERIES TO ACHIEVE THE REQUIRED ACCURACY.
- TACHOMETER RELAY SET AT APP. 94.5% SPEED.
- UNDERVOLTAGE 3 PHASE RELAY WILMAR MODEL 401-45, RANGE 85-120, SET AT 103.5 (90% RATED) VOLTS.
- GENERATOR BREAKER CLOSING PERMITTED WHEN VOLTAGE AND SPEED ABOVE THE SET VALUES.
- FOR RELAY TABLE DATA, SEE DWG E1-0004-B.
- MOTOR SPACE HEATERS ARE NON-CLASS 1E.

**REFERENCE DRAWINGS**

- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
- E1-0001-A PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON
- E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAMS
- E1-0027-02, 02A 6.9 KV THREE LINE DIAGRAMS
- E1-0031-0 SAFEGUARD 6.9 KV SWGR BKR SCHEMATICS AND CONNECTION DIAGRAM INDEX

**DRAWING** 2323-E1-0004 **REV** CP-5  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

E1-0004	
E1-0004-A	
E1-0004-B	

**TRAIN B**  
**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1 SAFETY CATEGORY I  
 SAFETY CLASS 2 CLASS IIE  
 SAFETY CLASS 3 SAFETY CATED CIRCUITS

**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

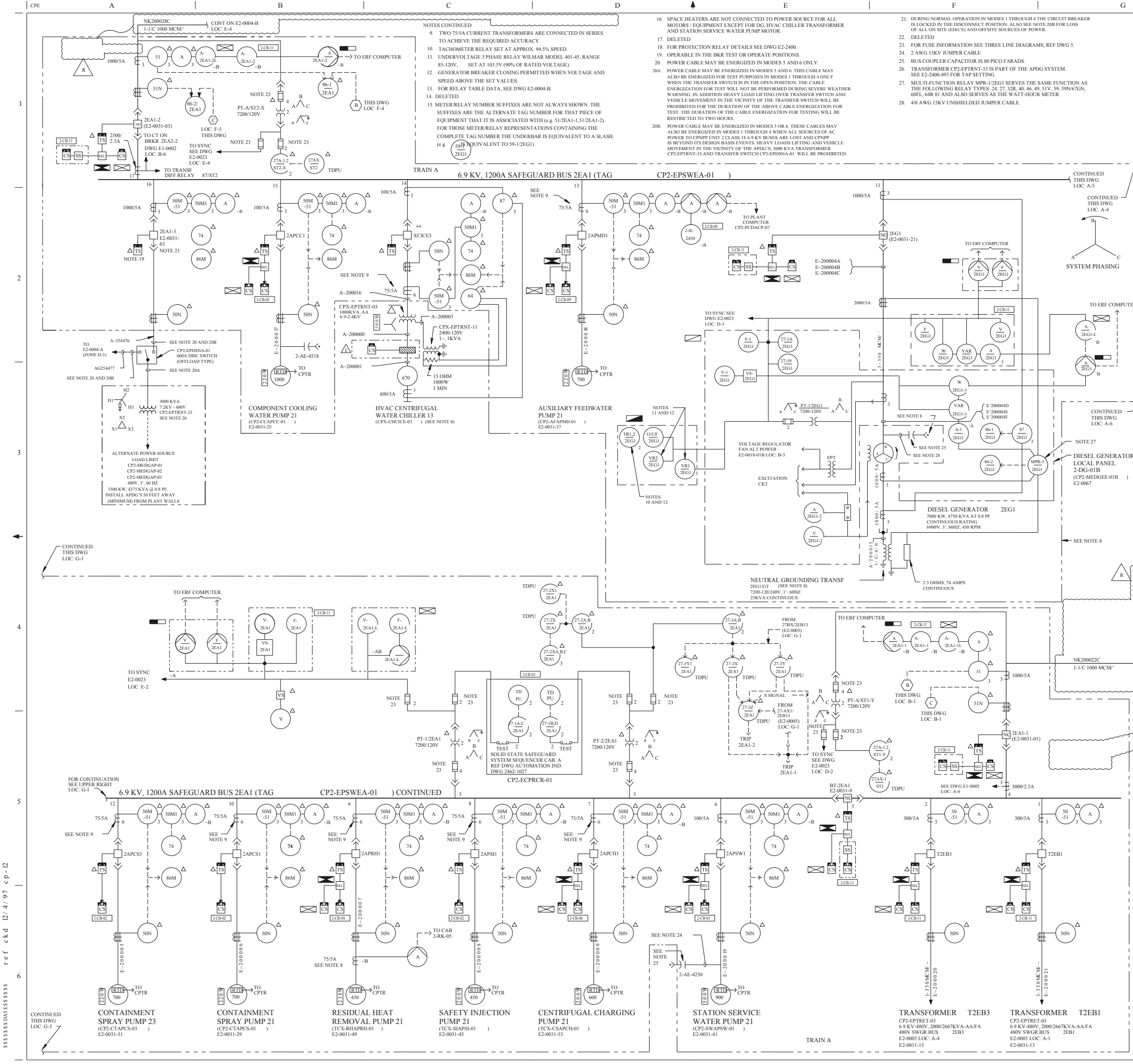
**6.9 KV AUXILIARIES**  
**ONE LINE DIAGRAM**  
**SAFEGUARD BUSES**

DWG NO: E1-0004 SH NO: A REV: CP-31

REF CKD 5/24/95 CP-13

THIS DRAWING CREATED ELECTRONICALLY





### FSAR FIGURE 8.3-6

**LEGEND**

- △ - LOCATION
- 3 - QUANTITY (NO NUMBER INDICATES ONE)
- - CONTROL SWITCH WITH LIGHTS
- - PERMISSIVE SWITCH WITH LIGHTS
- - GREEN LIGHT □ - WHITE LIGHT □ - BLUE LIGHT
- - RED LIGHT □ - AMBER LIGHT
- VS - VOLTMETER SWITCH
- SEL - SELECTOR SWITCH
- SS - SYNCHRONIZING SWITCH
- RTM - RUNNING TIME METER
- W - WINDOW OR THRU TYPE CURRENT TRANSFORMER, SEE NOTE 2
- / — - DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER
- W - LOCAL STARTER
- W - MOTOR SPACE HEATER (\* WATTS) KW = KILOWATTS, SEE NOTE 16
- - DC SHUNT, 400A, 50mV
- - TRANSDUCER (XD)
- LR - LINEAR REACTOR RESISTANCE=0015 OHMS
- HEAVY, 164V MAX, 310 AMPS
- THYRISTOR (SCR)
- GR - GOVERNOR RESISTOR BOX
- EPT - EXCITER POWER TRANSFORMER 3-, 153KV A 6900V (98873)-284.2V (164V) (FOR OTHER SYMBOLS SEE DWG E1-0001)
- - CONTROL ROOM PANEL NUMBER \*
- - DIESEL GENERATOR-LOCAL GENERATOR PANEL
- - DIESEL GENERATOR-LOCAL ENGINE PANEL
- - HOT SHUTDOWN PANEL (HSD)
- - SHUTDOWN TRANSFER PANEL (STP)
- - ERF TRANSDUCER PANEL CP2-EPCRLV-16
- - ERF TRANSDUCER PANEL CP2-EPCRLV-17
- △ - 6900V SWITCHGEAR
- △ - LOCAL NEAR CHILLER
- △ - CPTR INDICATES COMPUTER
- IE - 6A FUSE
- 6A, I.E. - FUSE RATING
- 2 - NUMBER OF FUSES, NO NUMBER MEANS (1) FUSE
- / — - BUS COUPLER CAPACITOR/TEST POINT FOR PARTIAL DISCHARGE MONITORING

**NOTES**

- SWITCHGEAR CLASS 500MVA IC ALL BREAKERS ARE 1200A.
- GROUND SENSORS TO BE USED WITH GROUND OVERCURRENT (ITE TYPE GS-5, 5-50A) RELAYS 50N AND 51N.
- CABLE SIZE, WHERE NOT SHOWN, IS 40 AWG.
- QUANTITY, WHERE NOT SHOWN, IS ONE (1).
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY THE LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKERS, INDICATED BY "N" NEXT TO THE LOAD CIRCUIT BREAKER, AND THE BREAKER TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL.
- DELETED
- DELETED
- EQUIPMENT ENCLOSED INSIDE DASHED LINE IS CLASS 1E ELECTRICAL EQUIPMENT EXCEPT THE FOLLOWING: GROUNDING TRANSFORMER FOR DG, 2EG1 IS NON-CLASS 1E. POWER CABLING FOR HVAC CENTRIFUGAL WATER CHILLER 13 IS ASSOCIATED CLASS 1E TRAIN A. ALSO ON THE LOAD SIDE OF BREAKER 2APRH1, THE 75/5A CT'S SECONDARY IS NON-CLASS 1E, TEST POINT FOR PARTIAL DISCHARGE MONITORING.

**REFERENCE DRAWINGS**

- E1-0001 PLANT ONE LINE DIAGRAM (UNIT 1 AND 2)
- E1-0002 MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1 SAFEGUARD)
- E1-0002-A AND E1-0002-B 6.9 KV ONE LINE BUS (UNIT 2)
- E2-0005 480V ONE LINE SAFEGUARD BUS (UNIT 2)
- E2-0027-01 AND E2-0027-01A 6.9 KV THREE LINE DIAGRAM - SAFEGUARD BUSES (UNIT 2)
- E2-0002-A AND E2-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
- E2-0023 PHASING AND SYNCHRONIZING DIAGRAM (UNIT 2)
- E2-0031 AND E2-0067 (SERIES) SCHEMATIC DRAWINGS
- 2462-1027 AUTOMATIC IND. (SOLID STATE SEQUENCER)
- E2-2400-301 PROTECTIVE DEVICE SETTING SYSTEM INDEX

DRAWING NO.	2223-E2-0004	REV.	CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0004			
E2-0004-A			
E2-0004-B			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

**6.9 KV AUXILIARIES**  
ONE LINE DIAGRAM  
SAFEGUARD BUSES

DWG NO. **E2-0004** SH NO. - REV. **CP-30**

THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE  
FDA-2014-000225-02 PER 36-0011-14-000225-02-00

THIS DRAWING CREATED ELECTRONICALLY

ref ekd 12/4/97 cp-12

NOTES CONTINUED

- 9. TWO 75/5A CURRENT TRANSFORMERS ARE CONNECTED IN SERIES TO ACHIEVE THE REQUIRED ACCURACY.
- 10. TACHOMETER RELAY SET AT APPROX. 94.5% SPEED.
- 11. UNDERVOLTAGE 3 PHASE RELAY WILLMAR MODEL 401-45, RANGE 85-120V. SET AT 103.5V (90% OF RATED VOLTAGE).
- 12. GENERATOR BREAKER CLOSING PERMITTED WHEN VOLTAGE AND SPEED ABOVE THE SET VALUES.
- 13. FOR RELAY TABLE DATA, SEE DWG E2-0004-B.
- 14. DELETED.
- 15. METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT'S ASSOCIATED WITH (E.G. 51/2EA2-1, 51/2EA2-2). FOR THOSE METER/RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER THE UNDERBAR IS EQUIVALENT TO A SLASH (E.G. 51/2EA2-1 IS EQUIVALENT TO 51-1/2EG2).

- 16. SPACE HEATERS ARE NOT CONNECTED TO POWER SOURCE FOR ALL MOTORS/EQUIPMENT EXCEPT FOR DC, CHILLER TRANSFORMER AND STATION SERVICE WATER PUMP MOTOR.
- 17. DELETED.
- 18. FOR PROTECTION RELAY DETAILS SEE DWG E2-2400.
- 19. OPERABLE IN THE BKR TEST OR OPERATE POSITIONS.
- 20. POWER CABLE MAY BE ENERGIZED IN MODES 5 OR 6. THESE CABLES MAY ALSO BE ENERGIZED IN MODES 1 THROUGH 4 WHEN ALL SOURCES OF AC POWER TO CPNPP UNIT 2 CLASS 1E 6.9 KV BUSES ARE LOST AND CPNPP IS BEYOND ITS DESIGN BASIS EVENTS. HEAVY LOADS LIFTING AND VEHICLE MOVEMENT IN THE VICINITY OF THE APD/S, 3000 KVA TRANSFORMER CP2-EPRINT-33 AND TRANSFER SWITCH CP2-EPNSA-01 WILL BE PROHIBITED.

- 21. DURING NORMAL OPERATIONS IN MODES 1 THROUGH 4 THE CIRCUIT BREAKER IS LOCKED IN THE DISCONNECT POSITION. ALSO SEE NOTE 20 FOR LOSS OF ALL ONSITE (EDGs) AND OFFSITE SOURCES OF POWER.
- 22. FOR FUSE INFORMATION SEE THREE LINE DIAGRAMS, REF DWG 5.
- 23. 2 AWG 15KV JUMPER CABLE.
- 24. BUS COUPLER CAPACITOR IS 80 PICO FARADS.
- 25. 40 AWG 15KV UNSHIELDED JUMPER CABLE.
- 26. MULTI-FUNCTION RELAY MPR-1/2EG2 SERVES THE SAME FUNCTION AS THE FOLLOWING RELAY TYPES: 24, 27, 32R, 40, 46, 49, 51V, 59, 59N/67GN, 60FL, 64R, 81 AND ALSO SERVES AS THE WATT-HOUR METER.

REV	DATE	CHKD	APPD	REMARKS
1	2015	2015	2015	THIS DRAWING REVISED TO INCORPORATE ALCR-2015-00037.1 TO EDITORIALY CORRECT CONDUIT NUMBER FROM EG200042E TO EG200042C.

### FSAR FIGURE 8.3-6

- LEGEND:
- LOCATION
  - QUANTITY (NO NUMBER INDICATES ONE)
  - CONTROL SWITCH WITH LIGHTS
  - PERMISSIVE SWITCH WITH LIGHTS
  - GREEN LIGHT □ WHITE LIGHT □ BLUE LIGHT
  - RED LIGHT □ AMBER LIGHT
  - VS - VOLTMETER SWITCH
  - SS - SELECTOR SWITCH
  - SS - SYNCHRONIZING SWITCH
  - RTM - RUNNING TIME METER
  - W - WINDOW OR THRU TYPE CURRENT TRANSFORMER, SEE NOTE 2
  - W - DRAWOUT DISCONNECT FOR BREAKER OR POTENTIAL TRANSFORMER
  - W - LOCAL STARTER
  - W - MOTOR SPACE HEATER (\* WATTS, KW = KILOWATTS), SEE NOTE 16
  - W - DC SHUNT, 400A, 50mV
  - W - TRANSDUCER (XD)
  - LR - LINEAR REACTOR RESISTANCE=0015 OHMS
  - W - HEAVY, 164V MAX, 310 AMPS
  - W - THYRISTOR (SCR)
  - GR - GOVERNOR RESISTOR BOX
  - EPT - EXCITER POWER TRANSFORMER 3-1, 153KV A 6900V (3983Y)-284.3V (164Y) (FOR OTHER SYMBOLS SEE DWG E1-0001)
  - D - DIESEL GENERATOR-LOCAL ENGINE PANEL
  - D - DIESEL GENERATOR-LOCAL GENERATOR PANEL
  - HSD - HOT SHUTDOWN PANEL (HSD)
  - STP - SHUTDOWN TRANSFER PANEL (STP)
  - ERF - ERF TRANSDUCER PANEL CP2-ECRPLV-16
  - ERF - ERF TRANSDUCER PANEL CP2-ECRPLV-17
  - 6900V SWITCHGEAR
  - LOCAL NEAR CHILLER
  - CPTR - INDICATES COMPUTER
  - IE-6A - FUSE
  - IE-6A - FUSE RATING
  - 2 - NUMBER OF FUSES, NO NUMBER MEANS (1) FUSE
  - W - BUS COUPLER CAPACITOR/TEST POINT FOR PARTIAL DISCHARGE MONITORING

- NOTES:
- SWITCHGEAR CLASS 500MVA IC ALL BREAKERS ARE 1200A.
  - GROUND SENSORS TO BE USED WITH BREAKER OVERCURRENT (I) TYPE GS-5, 5-50A RELAYS 50N AND 51N.
  - CABLE SIZE, WHERE NOT SHOWN, IS 40 AWG.
  - QUANTITY, WHERE NOT SHOWN, IS ONE (1).
  - ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY THE LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKERS, INDICATED BY \*\* NEXT TO THE LOAD CIRCUIT BREAKER, AND THE BREAKER TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL.
  - DELETED
  - DELETED
  - EQUIPMENT ENCLOSED INSIDE DASHED LINE IS CLASS 1E ELECTRICAL EQUIPMENT EXCEPT THE FOLLOWING: GROUNDING TRANSFORMER FOR 2EG2 IS NON-CLASS 1E. POWER CABLING FOR HVAC CENTRIFUGAL WATER CHILLER 14 IS ASSOCIATED CLASS 1E TRAIN BB ALSO ON THE LOAD SIDE OF BREAKER 2APRH2 THE -B 75/5A CT'S SECONDARY IS NON-CLASS 1E, TEST POINT FOR PARTIAL DISCHARGE MONITORING. MPR-1/2EG2.

- REFERENCE DRAWINGS:
- E1-0001 PLANT ONE LINE DIAGRAM (UNIT 1 AND 2)
  - E1-0002, E1-0002-A AND E1-0002-B MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 1 SAFEGUARD)
  - E2-0000, E2-0005 AND E2-0005-A 6.9 KV ONE LINE SAFEGUARD BUS (UNIT 2) 480V ONE LINE SAFEGUARD BUS (UNIT 2)
  - E2-0005-A 6.9 KV THREE LINE DIAGRAM- SAFEGUARD BUSES (UNIT 2)
  - E2-0027-02 AND E2-0027-04 MAIN ONE LINE METER AND RELAY DIAGRAM (UNIT 2)
  - E2-0002 AND E2-0002-A PHASING AND SYNCHRONIZING DIAGRAM (UNIT 2)
  - E2-0023 (SERIES)
  - E2-0031 AND E2-0067 (SERIES)
  - 2462-1027 AUTOMATIC IND (SOLID STATE SEQUENCER)
  - E2-2400-301 PROTECTIVE DEVICE SETTING SYSTEM INDEX

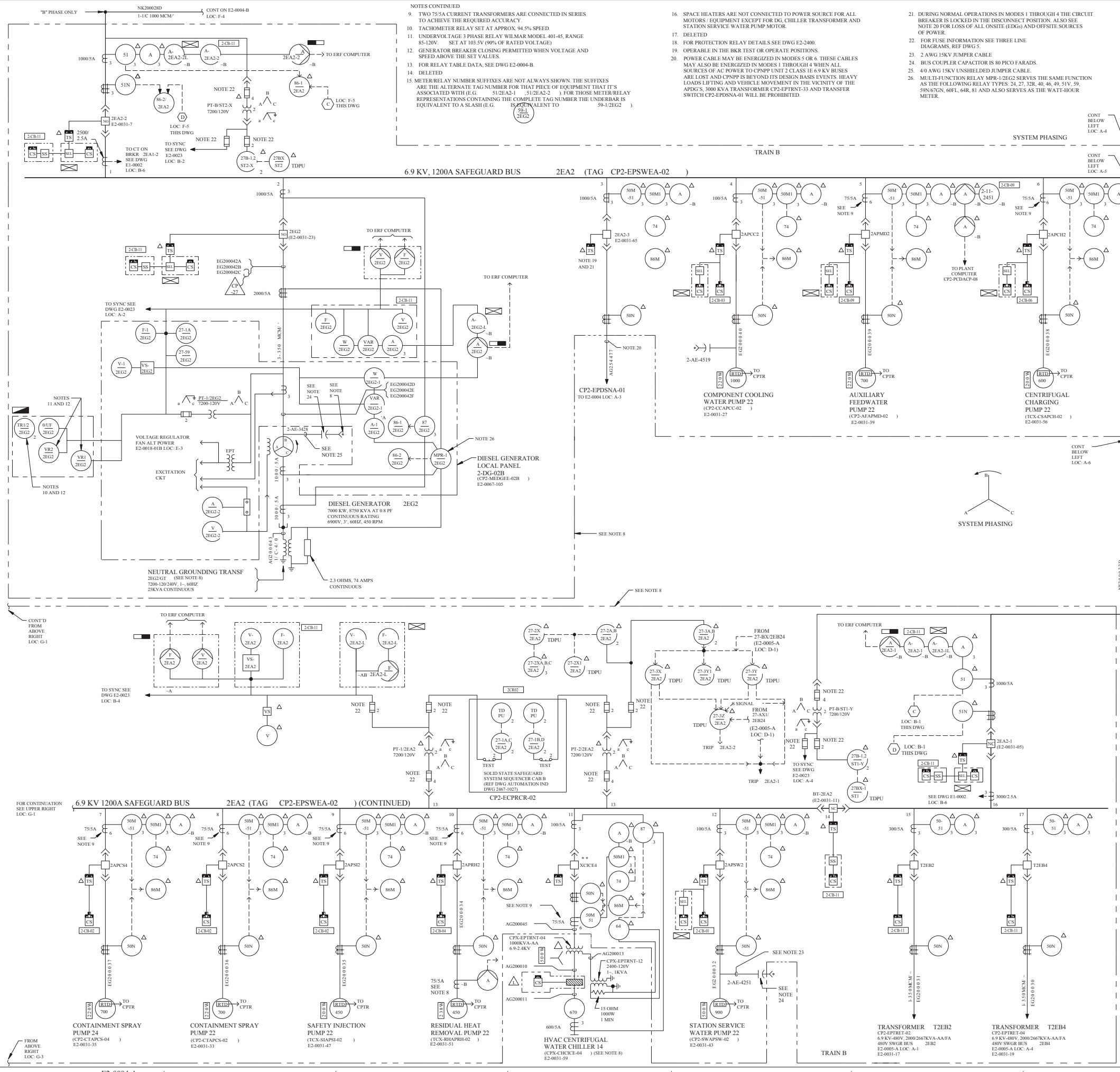
DRAWING NO.	2323-E2-0004	REV	CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0004			
E2-0004-A			
E2-0004-B			

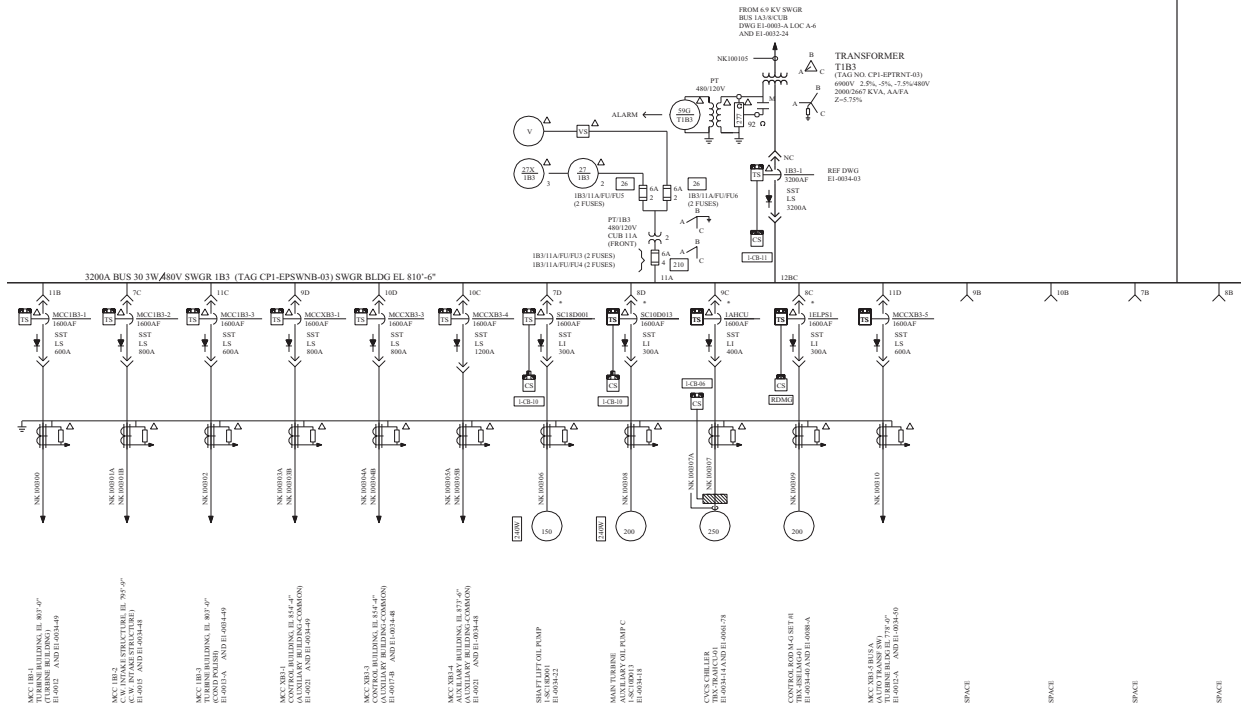
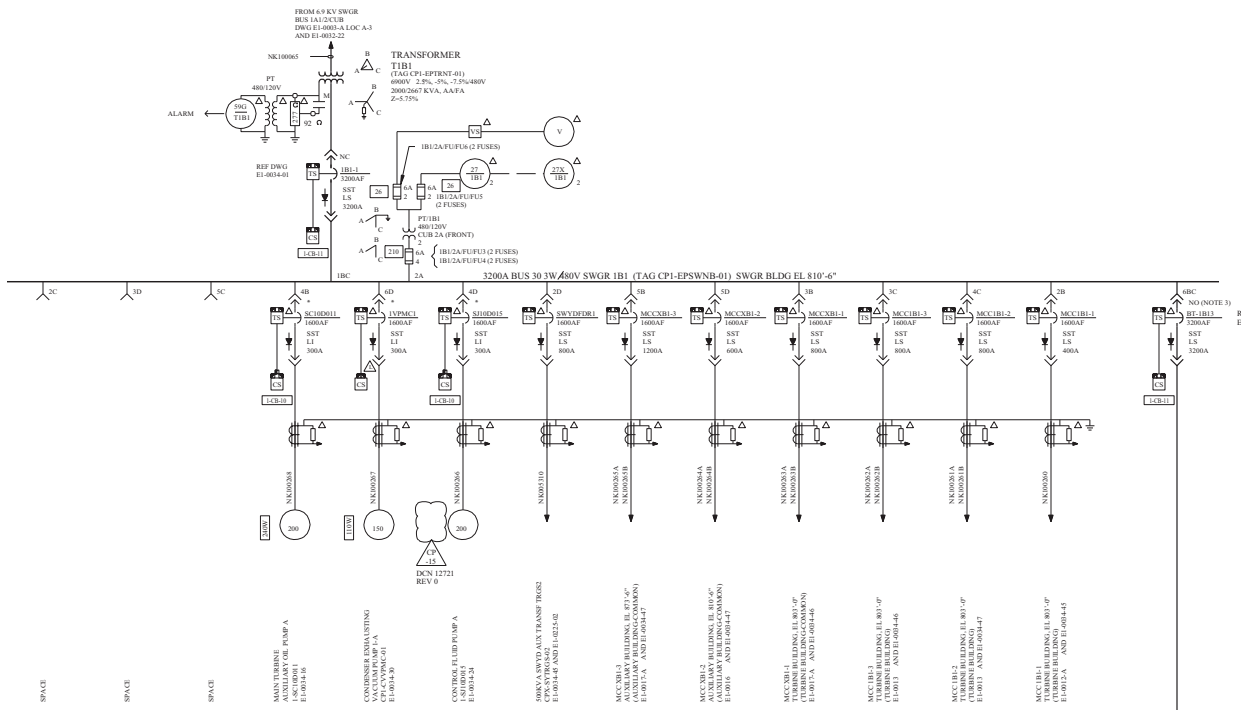
### CLASS I

(NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1 SEISMIC CATEGORY I  
 SAFETY CLASS 2 CLASS 1E  
 SAFETY CLASS 3 ASSOCIATED CIRCUITS

LUMINANT  
 CPNPP  
 GLEN ROSE, TEXAS

6.9 KV AUXILIARIES  
 ONE LINE DIAGRAM  
 SAFEGUARD BUSES





**FSAR FIGURE 8.3-7**

**LEGEND**

**SYMBOLS**

- DRAWOUT BREAKER DISCONNECT
- AIR CIRCUIT BREAKER, STORED ENERGY ELECTRICALLY OPERATED, DRAWOUT TYPE
- SET - SOLID STATE TRIP
- L1 - LONG TIME, SHORT TIME
- LI - LONG TIME, INSTANTANEOUS
- LOCATION
- QUANTITY (NO NUMBER INDICATES ONE)

**CONTROL SWITCH WITH LIGHTS**

- CLOSE-TRIP PUSHBUTTONS WITH LIGHTS
- GREEN LIGHT
- WHITE LIGHT
- RED LIGHT
- AMBER LIGHT

**RELAYS**

- UNDER VOLTAGE "G" TYPE (NOV11A) OR EQUAL
- TIME DELAY PICK-UP AUX RELAY 0.1-1.0 SEC AGAST TYPE 702 PA
- OVERVOLTAGE
- FUSE B/M ITEM NUMBER REF DWG 5

**LOCATIONS**

- ROD DRIVE M.G. SET CONTROL PANEL
- 480V SWITCHGEAR
- CONTROL ROOM PANEL NUMBER "X"
- LOCAL

**RELAYS**

- 27
- 27X
- 89G

**NOTES**

1. ALL MOTOR AND FEEDER RATINGS ARE GIVEN IN HP UNLESS OTHERWISE NOTED.
2. FEEDER BREAKERS MARKED WITH \* ARE TRIPPED ON BUS UNDERVOLTAGE BY 27X RELAYS.
3. ELECTRICAL INTERLOCK SHALL PRECLUDE PARALLELING OF TWO SOURCE TRANSFORMERS.
4. FOR REMOTELY CONTROLLED BREAKERS, LOCAL CONTROL IS NOT EFFECTIVE WHEN THE BREAKER IS IN OPERATING POSITION.
5. DELETED
6. BREAKER TRIP RATINGS ARE ADJUSTABLE BETWEEN 50% TO 125% OF SENSOR RATING.
7. METER RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT'S ASSOCIATED WITH (e.g. V1B1) FOR THOSE METER/RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER. THE "UNDERBAR" IS EQUIVALENT TO A "SLASH" (e.g. IS EL 810'-6 IS EQUIVALENT TO 27B1B).
8. MANUAL CLOSE INTERLOCK SCREWS ARE REMOVED TO ALLOW LOCAL OPERATION OF 480V SWITCHGEAR BREAKERS.
9. DELETED
10. DELETED

**REFERENCE DRAWINGS**

1. EI-0001 PLANT ONE-LINE DIAGRAM UNITS (AND 2)
2. EI-0001-A PLANT ONE-LINE DIAGRAM UNITS (COMMON)
3. EI-0004-0 NORMAL 480V SWGR IBE SCHEMATIC AND CONNECTION DIAGRAM INDEX
4. 144270-0 AND 144270-3 BUS 1E2 AND 1H4 ONE LINE AND SCHEMATIC DIAGRAMS
5. EI-0024-0 FUSE BILL OF MATERIAL

**DRAWING** 2323-EI-0006 REV 07-8  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
 EI-0006  
 EI-0006-A

**NON-SAFETY**

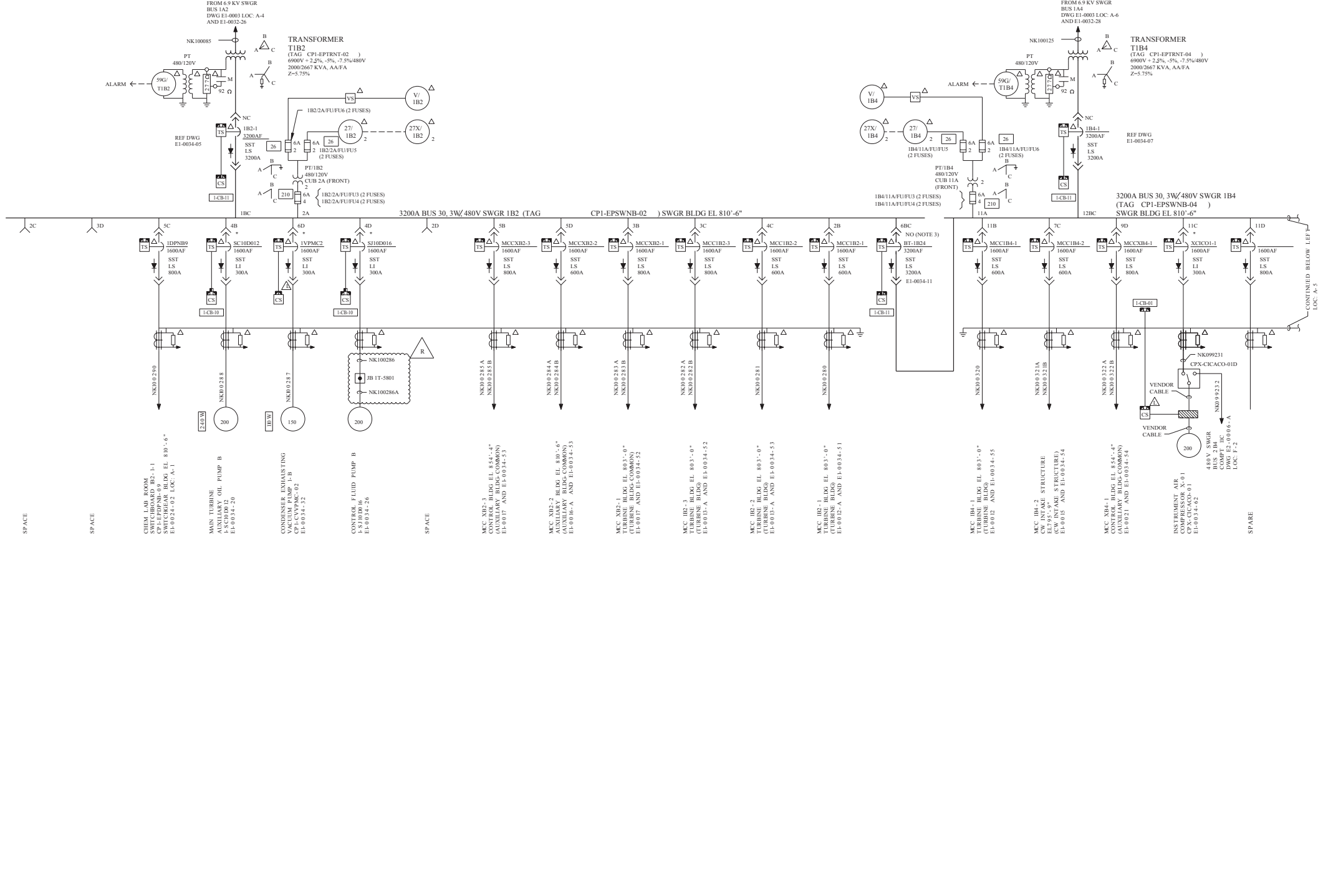
**TXU ELECTRIC  
 CPSE  
 GLEN ROSE, TEXAS**

**480V AUXILIARIES  
 ONE-LINE DIAGRAM  
 NORMAL BUSES**

DWG NO: EI-0006 SHE NO: REV: CP-15

REFERENCE CHECKED 09/07/21

THIS DRAWING CANNOT BE ELECTRONICALLY



REV	DWN	CHKD	APVD	REMARKS
CP-27	08/20/2012	08/20/2012		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2012-00078-01-00 PER SK. 000012-00078-01-00

## FSAR FIGURE 8.3-7

**LEGEND**

- DRAWOUT BREAKER DISCONNECT
- AIR CIRCUIT BREAKER, STORED ENERGY ELECTRICALLY OPERATED, DRAWOUT TYPE
- SST - SOLID STATE TRIP
  - LS - LONG TIME, SHORT TIME
  - LI - LONG TIME, INSTANTANEOUS
- LOCATION
- QUANTITY (NO NUMBER INDICATES ONE)
- CONTROL SWITCH WITH LIGHTS
- CLOSE-TRIP PUSH BUTTONS WITH LIGHTS
- GREEN LIGHT
- WHITE LIGHT
- RED LIGHT
- AMBER LIGHT
- VOLTMETER SELECTOR SWITCH
- MOTOR SPACE HEATER WITH X WATT RATING
- WINDOW TYPE CT
- RESISTOR 1 Ω, 5 WATT TO GRD PULSE DETECTION SCHEME, REF DWGS 4 AND 6.
- 277 Ω GROUNDING RESISTOR TAPPED AT 92
- M - CONTACT OF PULSING CONTACTOR
- VOLTMETER
- SEE NOTE 2
- LOCAL STARTER
- INDICATING LIGHTS

**LOCATIONS**

- RDMG - ROD DRIVE MG SET CONTROL PANEL
- 480V SWITCHGEAR
- X - CONTROL ROOM PANEL NUMBER X
- LOCAL

**RELAYS**

- 27 - UNDER VOLTAGE GE TYPE NGV13A11A OR EQUAL
- 27X - TIME DELAY PICK-UP AUX RELAY 0.1-1.0 SEC AGASTAT TYPE 7012 PA.
- 59G - OVERVOLTAGE, TYPE CV-8, 67 VOLTS RANGE.

- FUSE B/M ITEM NUMBER REF DWG 8

- INDICATES SPLICE PER 2323-ES-100

**NOTES**

1. ALL MOTOR AND FEEDER RATINGS ARE GIVEN IN HP UNLESS OTHERWISE NOTED.
2. FEEDER BREAKERS MARKED WITH \* ARE TRIPPED ON BUS UNDER VOLTAGE BY 27X RELAYS.
3. ELECTRICAL INTERLOCK SHALL PRECLUDE PARALLELING OF TWO SOURCE TRANSFORMERS.
4. FOR REMOTELY CONTROLLED BREAKERS, LOCAL CONTROL IS NOT EFFECTIVE WHEN THE BREAKER IS IN OPERATING POSITION.
5. DELETED
6. BREAKER TRIP RATINGS ARE ADJUSTABLE BETWEEN 50% TO 125% OF SENSOR RATING.
7. MANUAL CLOSE INTERLOCK SCREWS ARE REMOVED TO ALLOW LOCAL OPERATION OF 480V SWITCHGEAR BREAKERS.
8. DELETED

**REFERENCE DRAWINGS**

1. E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
2. E1-0001-A PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON
3. E1-0034-0 NORMAL 480V SWGR BKR SCHEMATIC AND CONNECTION DIAGRAM INDEX
4. 1442F02 BUS 1B2 AND 1B4 ONE LINE DIAGRAM SCHEMATIC DIAGRAM
5. 1442F03 BUS 1B1 ONE LINE DIAGRAM SCHEMATIC DIAGRAM
6. 9284D85 BUS 1B1 ADDITION, POWELL DRAWINGS
7. 143301-D1, D2, D3 AND D4
8. E1-0024-04 FUSE BILL OF MATERIAL

DRAWING E1-0006-A REV CP-8	
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0006-A	
E1-0006-B	
DRAWING 2323-E1-0006 REV CP-5	
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0006	
E1-0006-A	

NON-SAFETY

LUMINANT  
CPNP  
GLEN ROSE, TEXAS

480V AUXILIARIES  
ONE LINE DIAGRAM  
NORMAL BUSES

DWG NO E1-0006	SH NO A	REV CP-27
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REFERENCES CHECKED 4/9/97 CP-20

THIS DRAWING CREATED ELECTRONICALLY





NOTES (CONT.)

7. DELETED

8. METER RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBERS FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH, (eg V/2B1 ) FOR THOSE METER RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER, THE UNDERBAR IS EQUIVALENT TO A SLASH, (eg 27 IS EQUIVALENT TO 27/2B2 ).

9. MANUAL CLOSE INTERLOCK SCREWS ARE REMOVED TO ALLOW LOCAL OPERATION OF 480V SWITCHGEAR BREAKERS.

REV	DATE	BY	APPV	REMARKS
CP-11	06/01/2011	05/20/2011		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA:2011-000015-01-00 PER SK-000115-000015-01-00

FSAR FIGURE 8.3-7

- LEGEND:
- DRAWOUT BREAKER DISCONNECT
  - AIR CIRCUIT BREAKER, STORED ENERGY ELECTRICALLY OPERATED, DRAWOUT TYPE
  - SST - SOLID STATE TRIP
  - LS - LONG TIME, SHORT TIME
  - LI - LONG TIME, INSTANTANEOUS
  - I - INSTANTANEOUS
  - LOCATION
  - QUANTITY (NO NUMBER INDICATES ONE)
  - CONTROL SWITCH WITH LIGHTS
  - CLOSE-TRIP PUSH BUTTONS WITH LIGHTS
  - GREEN LIGHT
  - RED LIGHT
  - AMBER LIGHT
  - WHITE LIGHT
  - VOLTMETER SELECTOR SWITCH
  - LOCAL STARTER
  - MOTOR SPACE HEATER WITH "X" WATT RATING
  - WINDOW TYPE C.T. RESISTOR 1 Ω, 5 WATT
  - TYPE BYZ 50/5 AMP RATIO RESISTOR 1 Ω, 5 WATT
  - TO GRD PULSE DETECTION SCHEME, REF DWG 2
  - 277 Ω - GROUNDING RESISTOR TAPPED AT 92 Ω
  - M - CONTACT OF PULSING CONTACTOR
  - SEE NOTE 2
  - RDMG - ROD DRIVE M.G. SET CONTROL PANEL

- LOCATIONS
- 480V SWITCHGEAR
  - CONTROL ROOM PANEL NUMBER "X"
  - LOCAL
  - FUSE B/M ITEM NUMBER REF DWG 8
- RELAYS
- 27 - UNDER VOLTAGE "GE" TYPE NGV13A11A OR EQUAL
  - 27X - TIME DELAY PICK-UP AUXILIARY RELAY 0.1-1.0 SEC AGASTAT TYPE 7014 PA
  - 59G - OVERVOLTAGE, TYPE CV-8, 67 VOLTS RANGE
- NOTES
- ALL MOTOR AND FEEDER RATINGS ARE GIVEN IN HP UNLESS OTHERWISE NOTED.
  - FEEDER BREAKERS MARKED WITH \* ARE TRIPPED ON BUS UNDER VOLTAGE BY 27X RELAYS.
  - ELECTRICAL INTERLOCK SHALL PRECLUDE PARALLELING OF TWO SOURCE TRANSFORMERS.
  - FOR REMOTELY CONTROLLED BREAKERS, LOCAL CONTROL IS NOT EFFECTIVE WHEN THE BREAKER IS IN OPERATING POSITION.
  - DELETED
  - BREAKER TRIP RATINGS ARE ADJUSTABLE BETWEEN 50% TO 125% OF SENSOR RATING.

- REFERENCE DRAWINGS
- E1-0001 PLANT ONE LINE DIAGRAM-UNITS 1 AND 2
  - WESTINGHOUSE DRAWINGS 1442F29 BUS 2BAND 2B3 ONE LINE DIAGRAM
  - E2-0003A 69KV AUXILIARIES ONE LINE DIAGRAM
  - E2-0008 MCC ONE LINE DIAGRAMS E2-0012 AND -12A E2-0013 AND -13A E1-0015 E1-0016 E1-0017A AND -17B E1-0021
  - E1-0225-02
  - E2-0004 SERIES - SCHEMATIC DRAWINGS
  - E2-2400-211 - PROTECTIVE DEVICE SETTINGS SYSTEM INDEX
  - E2-0024-04 FUSE BILL OF MATERIAL

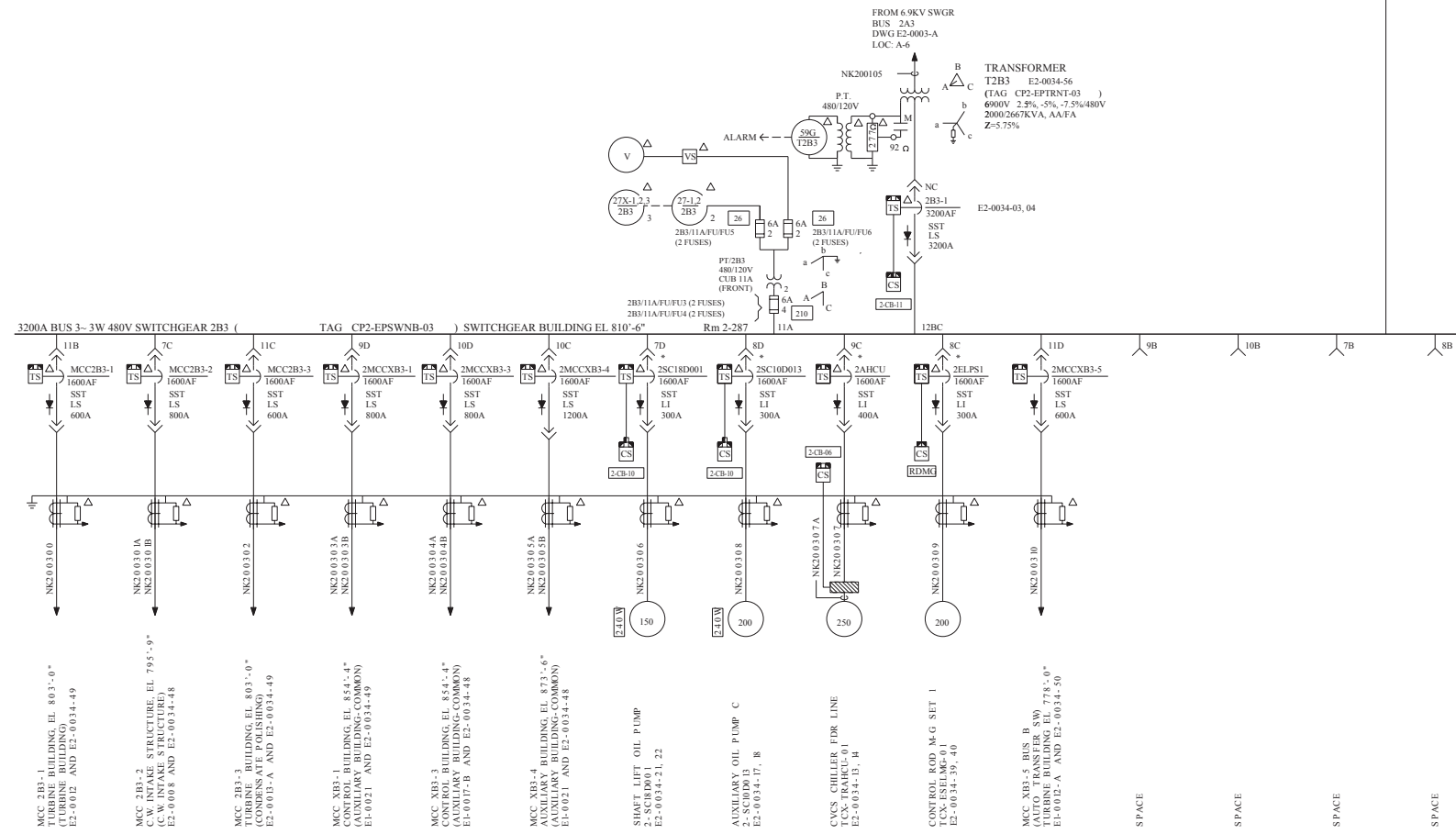
DWG. NO.	REV
E2-0006	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0006	
E2-0006-A	

NON-SAFETY

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

480V AUXILIARIES  
ONE LINE DIAGRAM  
NORMAL BUSES

DWG. NO.	SHEET NO.	REV.
E2-0006	-	CP-11



MCC 2B3-1 TURBINE BUILDING EL. 803'-0" (TURBINE BUILDING) E2-0012 AND E2-0034-49

MCC 2B3-2 C.W. INTAKE STRUCTURE EL. 795'-9" (C.W. INTAKE STRUCTURE) E2-0008 AND E2-0034-48

MCC 2B3-3 TURBINE BUILDING EL. 803'-0" (TURBINE BUILDING) E2-0013-A AND E2-0034-49

MCC XB3-1 BUILDING EL. 854'-4" (AUXILIARY BUILDING-COMMON) E1-0021 AND E2-0034-49

MCC XB3-2 CONTROL BUILDING EL. 854'-4" (AUXILIARY BUILDING-COMMON) E1-0017-B AND E2-0034-48

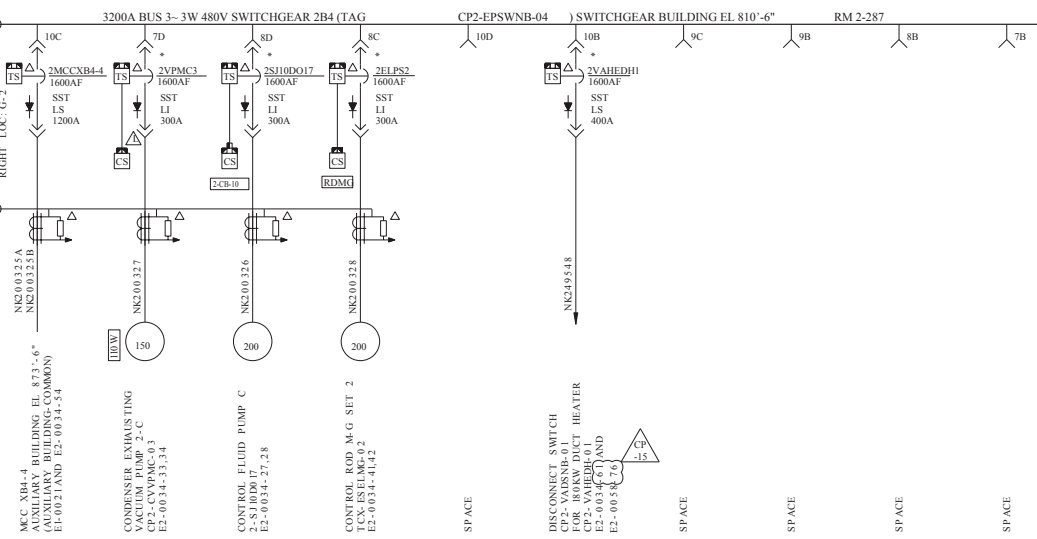
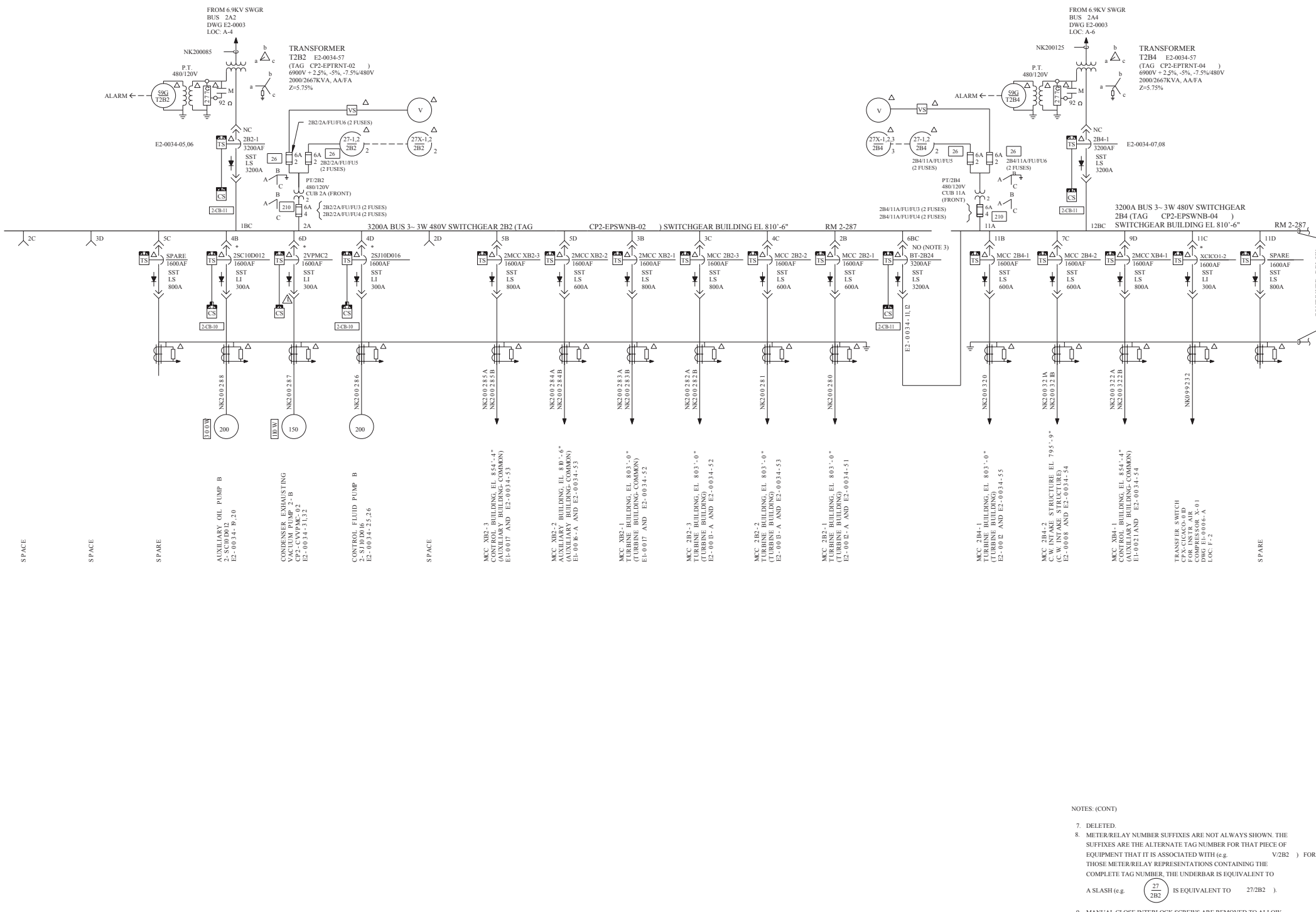
MCC XB3-4 AUXILIARY BUILDING EL. 873'-6" (AUXILIARY BUILDING-COMMON) E1-0021 AND E2-0034-48

SHAFT LIGHT OIL PUMP 2-SC180013 E2-0034-17, 18

AUXILIARY OIL PUMP C 2-SC180013 E2-0034-17, 18

CVCS CHILLER FDR LINE (AUTO TRANSFER SW) E1-0012-A AND E2-0034-50

MCC XB3-5 BUS B (AUTO TRANSFER SW) E1-0012-A AND E2-0034-50



REV	DATE	BY	CHK	APPV	REMARKS
27-15	06.26.2011	06.26.2011	06.26.2011	06.26.2011	THIS DRAWING REVISED TO INCORPORATE ALCR.2015.010091.1 TO CORRECTLY REFLECT THE DRAWING CONSTITUTIONS FROM E2-0004 AND E2-0058 TO E2-0004-61 AND E2-0058-76.

**FSAR FIGURE 8.3-7**

- LEGEND:
- DRAWOUT BREAKER DISCONNECT
  - AIR CIRCUIT BREAKER, STORED ENERGY, ELECTRICALLY OPERATED, DRAWOUT TYPE
  - SOLID STATE TRIP
  - LONG TIME, SHORT TIME
  - LONG TIME, INSTANTANEOUS
  - INSTANTANEOUS
  - LOCATION
  - QUANTITY (NO NUMBER INDICATES ONE)
  - CONTROL SWITCH WITH LIGHTS
  - CLOSE-TRIP PUSH BUTTONS WITH LIGHTS
  - GREEN LIGHT
  - RED LIGHT
  - AMBER LIGHT
  - WHITE LIGHT
  - VOLTMETER SELECTOR SWITCH
  - MOTOR SPACE HEATER WITH "X" WATT RATING
  - WINDOW TYPE C.T.
  - RESISTOR 1 Ω, 5 WATT
  - TO GRD PULSE DETECTION SCHEME, REF DWG 2
  - 277 Ω - GROUNDING RESISTOR TAPPED AT 92 Ω
  - M - CONTACT OF PULSING CONTACTOR
  - VOLTMETER
  - SEE NOTE 2
  - ROD DRIVE M.G. SET CONTROL PANEL

- LOCATIONS:
- 480V SWITCHGEAR
  - CONTROL ROOM PANEL NUMBER "X"
  - LOCAL
  - FUSE B/M ITEM NUMBER REF DWG 7
- RELAYS:
- 27 - UNDER VOLTAGE "GE" TYPE NGV13A11A OR EQUAL
  - 27X - TIME DELAY PICK-UP AUXILIARY RELAY 0.1-1.0 SEC AGASTAT TYPE 7014 PA
  - 59G - OVERVOLTAGE, CV-8, 67 VOLTS RANGE

- NOTES:
- ALL MOTOR AND FEEDER RATINGS ARE GIVEN IN HP UNLESS OTHERWISE NOTED.
  - FEEDER BREAKERS MARKED WITH \* ARE TRIPPED ON BUS UNDER VOLTAGE BY 27X RELAYS.
  - ELECTRICAL INTERLOCK SHALL PRECLUDE PARALLELING OF TWO SOURCE TRANSFORMERS.
  - FOR REMOTELY CONTROLLED BREAKERS, LOCAL CONTROL IS NOT EFFECTIVE WHEN THE BREAKER IS IN OPERATING POSITION.
  - DELETED.
  - BREAKER TRIP RATINGS ARE ADJUSTABLE BETWEEN 50% TO 125% OF SENSOR RATING.

- NOTES: (CONT)
- DELETED.
  - METER RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. V/2B2 ) FOR THOSE METER/RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER, THE UNDERBAR IS EQUIVALENT TO A SLASH (e.g.  $\frac{27}{2B2}$  IS EQUIVALENT TO 27/2B2 ).
  - MANUAL CLOSE INTERLOCK SCREWS ARE REMOVED TO ALLOW LOCAL OPERATION OF 480V SWITCHGEAR BREAKERS.

- REFERENCE DRAWINGS:
- E1-0001 PLANT ONE LINE DIAGRAM - UNITS 1 AND 2
  - WESTINGHOUSE DRAWINGS
    - 1442F30 BUS 2B2 AND 2B4 ONE LINE DIAGRAM
  - E2-0003 6.9KV AUXILIARIES ONE LINE DIAGRAM
  - E2-0008 MCC ONE LINE DIAGRAMS
    - E2-0012 AND-12A
    - E2-0013-A
    - E1-0015 AND-15A
    - E1-0016-A
    - E1-0017
    - E1-0021
  - E2-0034 SERIES, SCHEMATIC DIAGRAMS
  - E2-2400-211 - PROTECTIVE DEVICE SETTINGS SYSTEM INDEX
  - E2-0024-04 - FUSE BILL OF MATERIAL

DRAWING	2323-E2-0006	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0006			
E2-0006-A			

NON-SAFETY

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

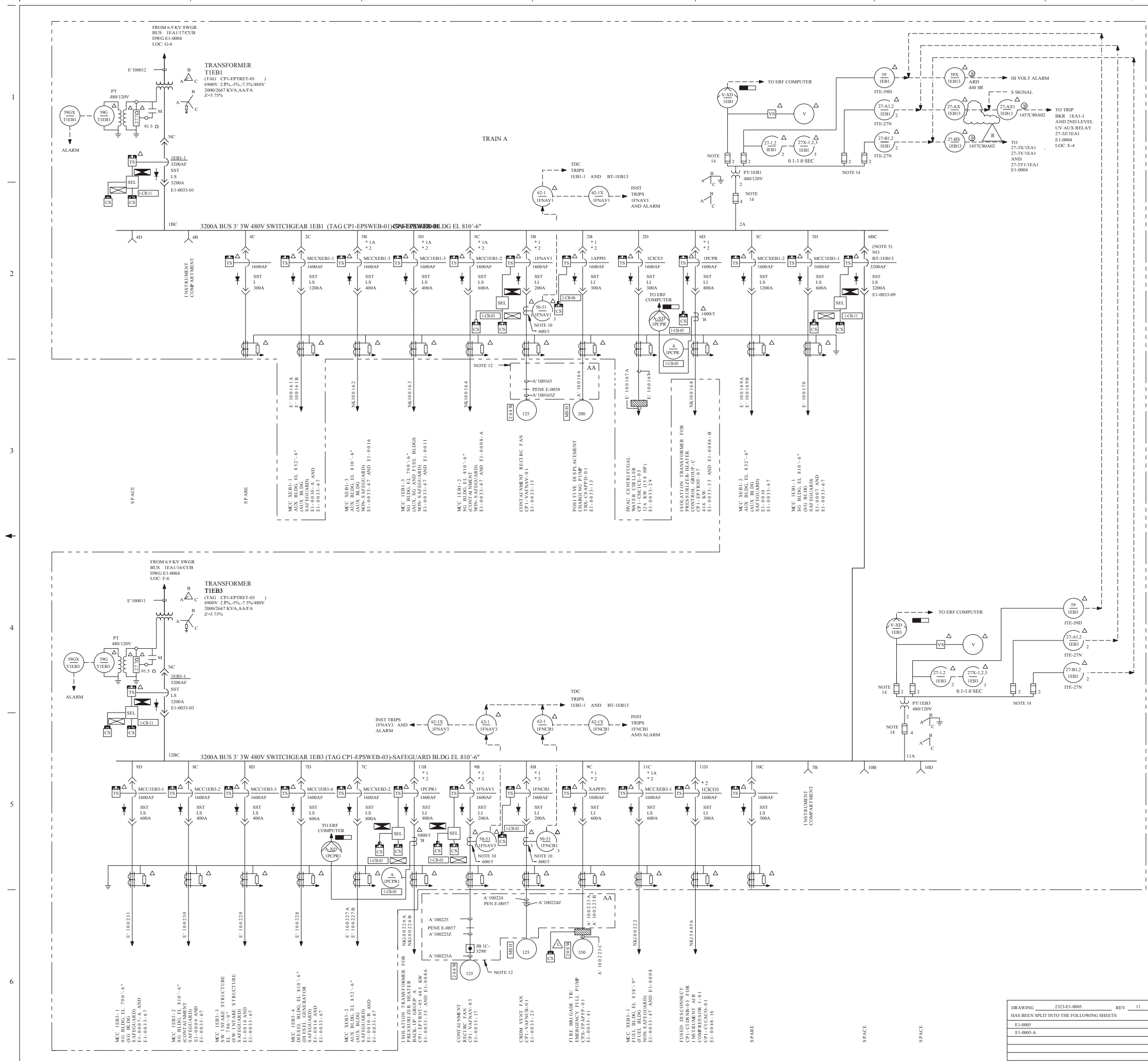
480V AUXILIARIES  
ONE LINE DIAGRAM  
NORMAL BUSES

DWG. NO.	E2-0006	SH. NO.	A	REV.	CP-15
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< FINAL PRINT >

THIS DRAWING CREATED ELECTRONICALLY

\$\$\$\$\$DATE\$\$\$\$\$



REV	DATE	BY	CHKD	APPV	REMARKS
P-27	08-29-2009	08-29-2009			THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FSA-2005-001066-01-00 PER SK-005-05-001066-01-00

### FSAR FIGURE 8.3-8

**LEGEND**

**SYMBOLS**

- DRAWOUT BREAKER DISCONNECT
- AIR CIRCUIT BREAKER, STORED ENERGY ELECTRICALLY OPERATED, DRAWOUT TYPE
- SST-SOLID STATE TRIP  
L=LONG TIME, SHORT TIME  
I=LONG TIME, INSTANTANEOUS  
I=INSTANTANEOUS
- QTY - QUANTITY (NO NUMBER INDICATES ONE)
- SEL - SELECTOR SWITCH
- CS - CONTROL SWITCH WITH LIGHTS
- IS - CLOSE-TRIP PUSH BUTTONS WITH LIGHTS  
NO - GREEN LIGHT  
ON - WHITE LIGHT  
AM - AMBER LIGHT
- VS - VOLTMETER SELECTOR SWITCH
- LS - LOCAL STARTER
- M - MOTOR SPACE HEATER WITH X WATT RATING
- W - WINDOW TYPE CT, T - BYZ 50.5 AMP RATIO RESISTOR 1.5 WATT TO GRD PULSE DETECTION SCHEME, REF DWG-3
- 27T - GROUNDING RESISTOR, TAPPED AT 91.5
- V - VOLTMETER
- CT - CURRENT TRANSFORMER CLASS C-100
- NS - NON-FUSE DISCONNECT SWITCH
- SP - INDICATES SPLICE

**LOCATIONS**

- 480V SWITCHGEAR
- LOCAL
- CONTROL ROOM PANEL X
- HOT SHUTDOWN PANEL (HSP)
- SHUTDOWN TRANSFER PANEL (STP)
- ERF TRANS-DUCER PANEL CP1-ECRPLY-16

**RELAYS**

- 27 - UNDERVOLTAGE GE TYPE NVU31A1A OR EQUAL
- 27X - TIME DELAY PICK-UP AUXILIARY RELAY 0.1-1.0 SEC AGASTAT TYPE E7012PA
- 59G - OVERVOLTAGE, PE CV-8, 67 VOLT RANGE
- 51 - ITE RELAY TYPE ITES1L, STYLE 22385340
- 50-51 - ITE RELAY TYPE ITES1M, STYLE 22388541
- 62 - TIME DELAY PICK UP AUXILIARY RELAY 0.1-1.0 SEC AGASTAT TYPE E7012PA

**NOTES**

- ALL MOTOR AND FEEDER RATINGS GIVEN IN HP UNLESS OTHERWISE NOTED
- EQUIPMENT ENCLOSED INSIDE DASHED LINE IS CLASS II ELECTRICAL EQUIPMENT EXCEPT AS FOLLOWS GROUND PULSING AND FAULTED FEEDER LOCATION SCHEME IS NOT REQUIRED TO REMAIN FUNCTIONAL DURING OR AFTER A DESIGN BASIS EVENT
- FEEDER BREAKERS MARKED WITH \* 1 ARE TRIPPED ON BUS UNDERVOLTAGE BY 27X RELAYS. FEEDER BREAKERS MARKED WITH \* 1A ARE TRIPPED ON BUS UNDERVOLTAGE BY 27 RELAYS OR BY DIESEL GENERATOR BREAKER \* 4 CONTACT ONLY AFTER THE DIESEL GENERATOR IS CONNECTED TO THE 69 KV SAFEGUARD BUS.
- ISOLATION BETWEEN CLASS IE BUS AND NON-CLASS IE LOAD IS PROVIDED BY THE LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKERS. INDICATED BY \* 2 NEXT TO THE LOAD CIRCUIT BREAKER, AND THE BREAKER TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL. LOAD CIRCUITS ARE ASSOCIATED CLASS IE TRAIN AA, BB OR NON CLASS IE TRAIN C AS APPLICABLE.
- ELECTRICAL INTERLOCK SHALL PRECLUDE PARALLELING OF TWO SOURCE TRANSFORMERS.
- NOT USED
- FOR REMOTELY CONTROLLED BREAKERS LOCAL CONTROL IS NOT EFFECTIVE WHEN THE BREAKER IS IN OPERATING POSITION.
- DELETED
- BREAKER TRIP RATINGS ARE ADJUSTABLE BETWEEN 50% TO 125% OF SENSOR RATING.
- TWO CT'S ARE ON THE BUS SIDE AND ONE CT IS ON THE LOAD SIDE.
- METER RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT'S ASSOCIATED WITH (e.g. V/IEB1). FOR THOSE METER RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER, THE "UNDERBAR" IS EQUIVALENT TO A "SLASH" (e.g. 59/IEB1) IS EQUIVALENT TO 59/IEB1).
- CABLES ENCLOSED INSIDE DASHED LINE ARE ASSOCIATED CLASS IE, TRAIN AA AND EQUIPMENT IS NON-IE.
- MANUAL CLOSE INTERLOCK SCREWS ARE REMOVED TO ALLOW LOCAL OPERATION OF 480V SWITCHGEAR BREAKERS.
- FOR FUSE INFORMATION SEE THREE LINE DIAGRAMS, E1-0033-63, -71.

**REFERENCE DRAWINGS**

E1-0001	PLANT ONE LINE DIAGRAM UNITS 1 AND 2
E1-0001-A	PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON
E1-0033-0	SAFEGUARD 480V SWGR BKR SCHEMATIC AND CONNECTION DIAGRAM INDEX
1442F57, 57A	WESTINGHOUSE 480V SWGR BUS IEB1 AND IEB3 ONE LINE DIAGRAMS
1442F59, 89A, 89B	WESTINGHOUSE 480V SWGR SWITCH DEVELOPMENT AND UNDERVOLTAGE SCHEMATIC DIAGRAMS

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 - SBEMC CATEGORY I  
SAFETY CLASS 2  
SAFETY CLASS 3 - ASSOCIATED CIRCUITS

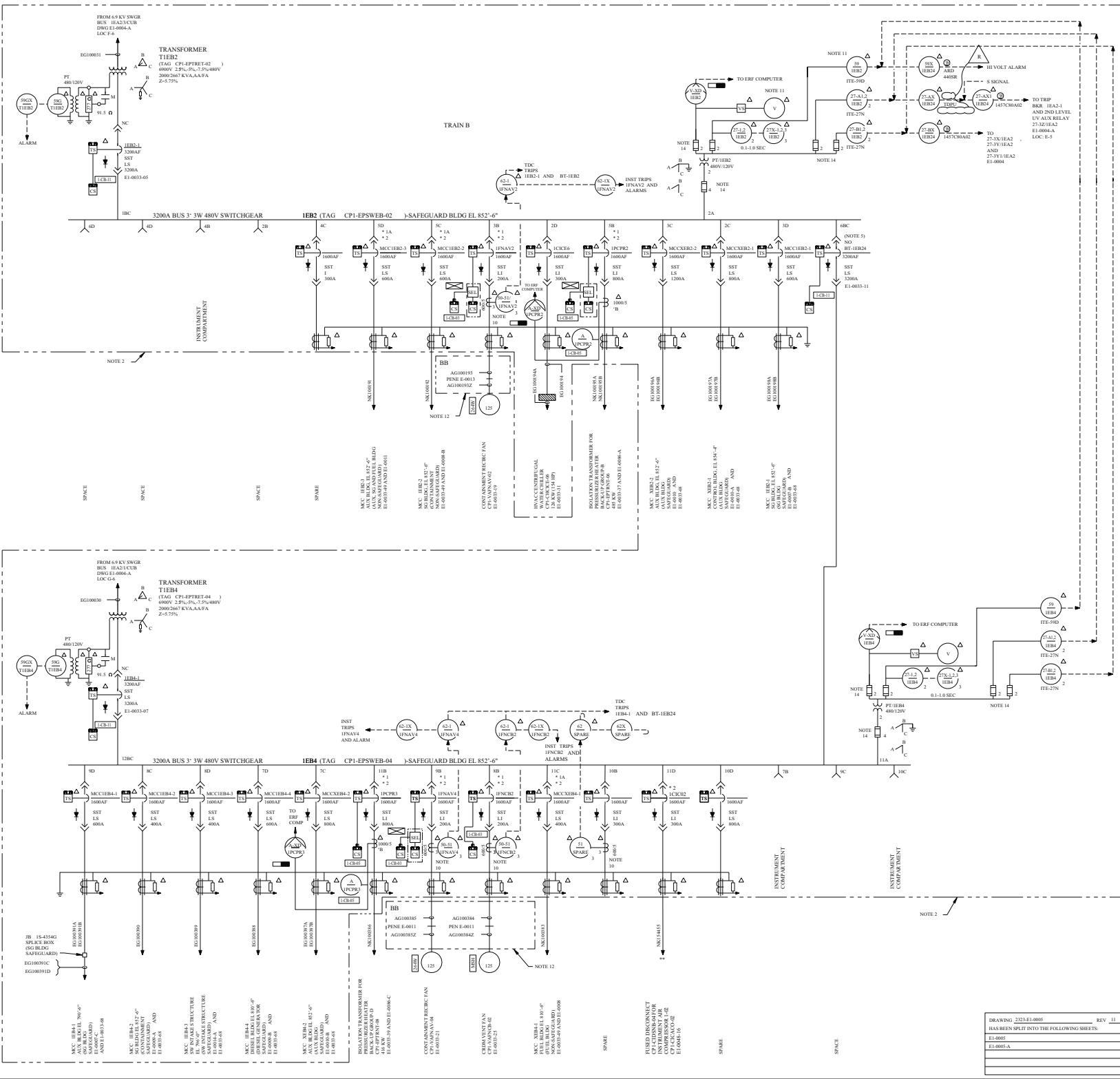
**LUMINANT CPNPP**  
GLEN ROSE, TEXAS

**480V AUXILIARIES ONE LINE DIAGRAM SAFEGUARD BUSES**

DWG NO.	E1-0005	SH	REV.	CP-27
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DRAWING 2323-E1-0005 REV 11  
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
E1-0005  
E1-0005-A

THIS DRAWING CREATED ELECTRONICALLY



REV	DATE	BY	CHKD	APPV	REMARKS
001	08/08				ISSUE DRAWING FOR TRAIN B INSTRUMENTATION SCHEMATIC CHANGE FSA 2005 001004-01-00 FOR REL 0022-05-001004-01-00

### FSAR FIGURE 8.3-8

**LEGEND**

- DRAWOUT BREAKER DISCONNECT
- AIR CIRCUIT BREAKER STORED ENERGY ELECTRICALLY OPERATED, DRAWOUT TYPE
- SOLID STATE TRIP
  - LONG TIME, SHORT TIME
  - LONG TIME, INSTANTANEOUS
  - INSTANTANEOUS
- LOCATION
- QUANTITY (NO NUMBER INDICATES ONE)
- SELECTOR SWITCH
- CONTROL SWITCH WITH LIGHTS
  - GREEN LIGHT
  - RED LIGHT
  - WHITE LIGHT
  - AMBER LIGHT
- VOLTMETER SELECTOR SWITCH
- LOCAL STARTER
- MOTOR SPACE HEATER WITH X WATT RATING
- WINDOW TYPE CT TV 50/5 AMP RATIO
- RESISTOR 1/2 WATT
- 277 OHM RESISTOR, TAPPED AT 91.5
- VOLTMETER
- TRANSDUCER

\* 1 OR 1A - SEE NOTE 3, \* 2 SEE NOTE 4  
 - CURRENT TRANSFORMER CLASS C-100  
 - NON-FUSE DISCONNECT SWITCH

**LOCATIONS**

- 480V SWITCHGEAR
- LOCAL
- CONTROL ROOM PANEL X
- HOT SHUTDOWN PANEL (HSP)
- SHUTDOWN TRANSFER PANEL (STP)
- ERF TRANSDUCER PANEL - CP-EPCLP-17

**RELAYS**

- 27 - UNDERVOLTAGE TYPE NOV11A OR EQUAL
- 27X - TIME DELAY PICK UP AUXILIARY RELAY 0.1-1.0 SEC AGASTAT TYPE E7012PA
- 59G - OVERVOLTAGE, TYPE CV-8, 67 VOLT RANGE
- 51 - JTE RELAY TYPE TESTIL, STYLE 238540
- 50-51 - JTE RELAY TYPE TESTIL, STYLE 238541
- 62 - TIME DELAY PICK UP AUXILIARY RELAY 0.1-1.0 SEC AGASTAT TYPE E7012PA

**NOTES**

- ALL MOTOR AND FEEDER RATINGS GIVEN IN HP UNLESS OTHERWISE NOTED
- \* 1 OR 1A OR 1B OR 1C OR 1D OR 1E OR 1F OR 1G OR 1H OR 1I OR 1J OR 1K OR 1L OR 1M OR 1N OR 1O OR 1P OR 1Q OR 1R OR 1S OR 1T OR 1U OR 1V OR 1W OR 1X OR 1Y OR 1Z OR 1AA OR 1AB OR 1AC OR 1AD OR 1AE OR 1AF OR 1AG OR 1AH OR 1AI OR 1AJ OR 1AK OR 1AL OR 1AM OR 1AN OR 1AO OR 1AP OR 1AQ OR 1AR OR 1AS OR 1AT OR 1AU OR 1AV OR 1AW OR 1AX OR 1AY OR 1AZ OR 1BA OR 1BB OR 1BC OR 1BD OR 1BE OR 1BF OR 1BG OR 1BH OR 1BI OR 1BJ OR 1BK OR 1BL OR 1BM OR 1BN OR 1BO OR 1BP OR 1BQ OR 1BR OR 1BS OR 1BT OR 1BU OR 1BV OR 1BW OR 1BX OR 1BY OR 1BZ OR 1CA OR 1CB OR 1CC OR 1CD OR 1CE OR 1CF OR 1CG OR 1CH OR 1CI OR 1CJ OR 1CK OR 1CL OR 1CM OR 1CN OR 1CO OR 1CP OR 1CQ OR 1CR OR 1CS OR 1CT OR 1CU OR 1CV OR 1CW OR 1CX OR 1CY OR 1CZ OR 1DA OR 1DB OR 1DC OR 1DD OR 1DE OR 1DF OR 1DG OR 1DH OR 1DI OR 1DJ OR 1DK OR 1DL OR 1DM OR 1DN OR 1DO OR 1DP OR 1DQ OR 1DR OR 1DS OR 1DT OR 1DU OR 1DV OR 1DW OR 1DX OR 1DY OR 1DZ OR 1EA OR 1EB OR 1EC OR 1ED OR 1EE OR 1EF OR 1EG OR 1EH OR 1EI OR 1EJ OR 1EK OR 1EL OR 1EM OR 1EN OR 1EO OR 1EP OR 1EQ OR 1ER OR 1ES OR 1ET OR 1EU OR 1EV OR 1EW OR 1EX OR 1EY OR 1EZ OR 1FA OR 1FB OR 1FC OR 1FD OR 1FE OR 1FF OR 1FG OR 1FH OR 1FI OR 1FJ OR 1FK OR 1FL OR 1FM OR 1FN OR 1FO OR 1FP OR 1FQ OR 1FR OR 1FS OR 1FT OR 1FU OR 1FV OR 1FW OR 1FX OR 1FY OR 1FZ OR 1GA OR 1GB OR 1GC OR 1GD OR 1GE OR 1GF OR 1GG OR 1GH OR 1GI OR 1GJ OR 1GK OR 1GL OR 1GM OR 1GN OR 1GO OR 1GP OR 1GQ OR 1GR OR 1GS OR 1GT OR 1GU OR 1GV OR 1GW OR 1GX OR 1GY OR 1GZ OR 1HA OR 1HB OR 1HC OR 1HD OR 1HE OR 1HF OR 1HG OR 1HH OR 1HI OR 1HJ OR 1HK OR 1HL OR 1HM OR 1HN OR 1HO OR 1HP OR 1HQ OR 1HR OR 1HS OR 1HT OR 1HU OR 1HV OR 1HW OR 1HX OR 1HY OR 1HZ OR 1IA OR 1IB OR 1IC OR 1ID OR 1IE OR 1IF OR 1IG OR 1IH OR 1II OR 1IJ OR 1IK OR 1IL OR 1IM OR 1IN OR 1IO OR 1IP OR 1IQ OR 1IR OR 1IS OR 1IT OR 1IU OR 1IV OR 1IW OR 1IX OR 1IY OR 1IZ OR 1JA OR 1JB OR 1JC OR 1JD OR 1JE OR 1JF OR 1JG OR 1JH OR 1JI OR 1JJ OR 1JK OR 1JL OR 1JM OR 1JN OR 1JO OR 1JP OR 1JQ OR 1JR OR 1JS OR 1JT OR 1JU OR 1JV OR 1JW OR 1JX OR 1JY OR 1JZ OR 1KA OR 1KB OR 1KC OR 1KD OR 1KE OR 1KF OR 1KG OR 1KH OR 1KI OR 1KJ OR 1KK OR 1KL OR 1KM OR 1KN OR 1KO OR 1KP OR 1KQ OR 1KR OR 1KS OR 1KT OR 1KU OR 1KV OR 1KW OR 1KX OR 1KY OR 1KZ OR 1LA OR 1LB OR 1LC OR 1LD OR 1LE OR 1LF OR 1LG OR 1LH OR 1LI OR 1LJ OR 1LK OR 1LL OR 1LM OR 1LN OR 1LO OR 1LP OR 1LQ OR 1LR OR 1LS OR 1LT OR 1LU OR 1LV OR 1LW OR 1LX OR 1LY OR 1LZ OR 1MA OR 1MB OR 1MC OR 1MD OR 1ME OR 1MF OR 1MG OR 1MH OR 1MI OR 1MJ OR 1MK OR 1ML OR 1MM OR 1MN OR 1MO OR 1MP OR 1MQ OR 1MR OR 1MS OR 1MT OR 1MU OR 1MV OR 1MW OR 1MX OR 1MY OR 1MZ OR 1NA OR 1NB OR 1NC OR 1ND OR 1NE OR 1NF OR 1NG OR 1NH OR 1NI OR 1NJ OR 1NK OR 1NL OR 1NM OR 1NN OR 1NO OR 1NP OR 1NQ OR 1NR OR 1NS OR 1NT OR 1NU OR 1NV OR 1NW OR 1NX OR 1NY OR 1NZ OR 1OA OR 1OB OR 1OC OR 1OD OR 1OE OR 1OF OR 1OG OR 1OH OR 1OI OR 1OJ OR 1OK OR 1OL OR 1OM OR 1ON OR 1OO OR 1OP OR 1OQ OR 1OR OR 1OS OR 1OT OR 1OU OR 1OV OR 1OW OR 1OX OR 1OY OR 1OZ OR 1PA OR 1PB OR 1PC OR 1PD OR 1PE OR 1PF OR 1PG OR 1PH OR 1PI OR 1PJ OR 1PK OR 1PL OR 1PM OR 1PN OR 1PO OR 1PP OR 1PQ OR 1PR OR 1PS OR 1PT OR 1PU OR 1PV OR 1PW OR 1PX OR 1PY OR 1PZ OR 1QA OR 1QB OR 1QC OR 1QD OR 1QE OR 1QF OR 1QG OR 1QH OR 1QI OR 1QJ OR 1QK OR 1QL OR 1QM OR 1QN OR 1QO OR 1QP OR 1QQ OR 1QR OR 1QS OR 1QT OR 1QU OR 1QV OR 1QW OR 1QX OR 1QY OR 1QZ OR 1RA OR 1RB OR 1RC OR 1RD OR 1RE OR 1RF OR 1RG OR 1RH OR 1RI OR 1RJ OR 1RK OR 1RL OR 1RM OR 1RN OR 1RO OR 1RP OR 1RQ OR 1RR OR 1RS OR 1RT OR 1RU OR 1RV OR 1RW OR 1RX OR 1RY OR 1RZ OR 1SA OR 1SB OR 1SC OR 1SD OR 1SE OR 1SF OR 1SG OR 1SH OR 1SI OR 1SJ OR 1SK OR 1SL OR 1SM OR 1SN OR 1SO OR 1SP OR 1SQ OR 1SR OR 1SS OR 1ST OR 1SU OR 1SV OR 1SW OR 1SX OR 1SY OR 1SZ OR 1TA OR 1TB OR 1TC OR 1TD OR 1TE OR 1TF OR 1TG OR 1TH OR 1TI OR 1TJ OR 1TK OR 1TL OR 1TM OR 1TN OR 1TO OR 1TP OR 1TQ OR 1TR OR 1TS OR 1TT OR 1TU OR 1TV OR 1TW OR 1TX OR 1TY OR 1TZ OR 1UA OR 1UB OR 1UC OR 1UD OR 1UE OR 1UF OR 1UG OR 1UH OR 1UI OR 1UJ OR 1UK OR 1UL OR 1UM OR 1UN OR 1UO OR 1UP OR 1UQ OR 1UR OR 1US OR 1UT OR 1UU OR 1UV OR 1UW OR 1UX OR 1UY OR 1UZ OR 1VA OR 1VB OR 1VC OR 1VD OR 1VE OR 1VF OR 1VG OR 1VH OR 1VI OR 1VJ OR 1VK OR 1VL OR 1VM OR 1VN OR 1VO OR 1VP OR 1VQ OR 1VR OR 1VS OR 1VT OR 1VU OR 1VV OR 1VW OR 1VX OR 1VY OR 1VZ OR 1WA OR 1WB OR 1WC OR 1WD OR 1WE OR 1WF OR 1WG OR 1WH OR 1WI OR 1WJ OR 1WK OR 1WL OR 1WM OR 1WN OR 1WO OR 1WP OR 1WQ OR 1WR OR 1WS OR 1WT OR 1WU OR 1WV OR 1WW OR 1WX OR 1WY OR 1WZ OR 1XA OR 1XB OR 1XC OR 1XD OR 1XE OR 1XF OR 1XG OR 1XH OR 1XI OR 1XJ OR 1XK OR 1XL OR 1XM OR 1XN OR 1XO OR 1XP OR 1XQ OR 1XR OR 1XS OR 1XT OR 1XU OR 1XV OR 1XW OR 1XX OR 1XY OR 1XZ OR 1YA OR 1YB OR 1YC OR 1YD OR 1YE OR 1YF OR 1YG OR 1YH OR 1YI OR 1YJ OR 1YK OR 1YL OR 1YM OR 1YN OR 1YO OR 1YP OR 1YQ OR 1YR OR 1YS OR 1YT OR 1YU OR 1YV OR 1YW OR 1YX OR 1YY OR 1YZ OR 1ZA OR 1ZB OR 1ZC OR 1ZD OR 1ZE OR 1ZF OR 1ZG OR 1ZH OR 1ZI OR 1ZJ OR 1ZK OR 1ZL OR 1ZM OR 1ZN OR 1ZO OR 1ZP OR 1ZQ OR 1ZR OR 1ZS OR 1ZT OR 1ZU OR 1ZV OR 1ZW OR 1ZX OR 1ZY OR 1ZZ

**REFERENCE DRAWINGS**

- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
- E1-0001-A PLANT ONE LINE DIAGRAM UNIT 1 AND COMMON
- E1-0006 PRESSURIZED HEATER WIRING AND INTERCONNECTION DIAGRAM
- E1-0003-0 SAFEGUARD 480V SWGR BKR SCHEMATIC AND CONNECTION DIAGRAM UNITS

142578, 80A WESTINGHOUSE 480V SWGR BUS IEB2 AND IEB4  
 142579, 80A, 80B WESTINGHOUSE 480V SWGR SWITCH DEVELOPMENT AND UNDERVOLTAGE SCHEMATIC DIAGRAMS

**TRAIN B**

### CLASS I

(NUCLEAR SAFETY-RELATED)

SAFETY CLASS: CLASS I  
 SAFETY CLASS: CLASS I  
 SAFETY CLASS: CLASS I

### LUMINANT

CPNP  
 GLEN ROSE, TEXAS

**480V AUXILIARIES**  
 ONE LINE DIAGRAM  
 SAFEGUARD BUSES

DWG NO: E1-0005 SHEET NO: A REV: CP-23

DATE: 08/08

DRAWING 22241.0005 REV 11  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
 E1-0005  
 E1-0005-A

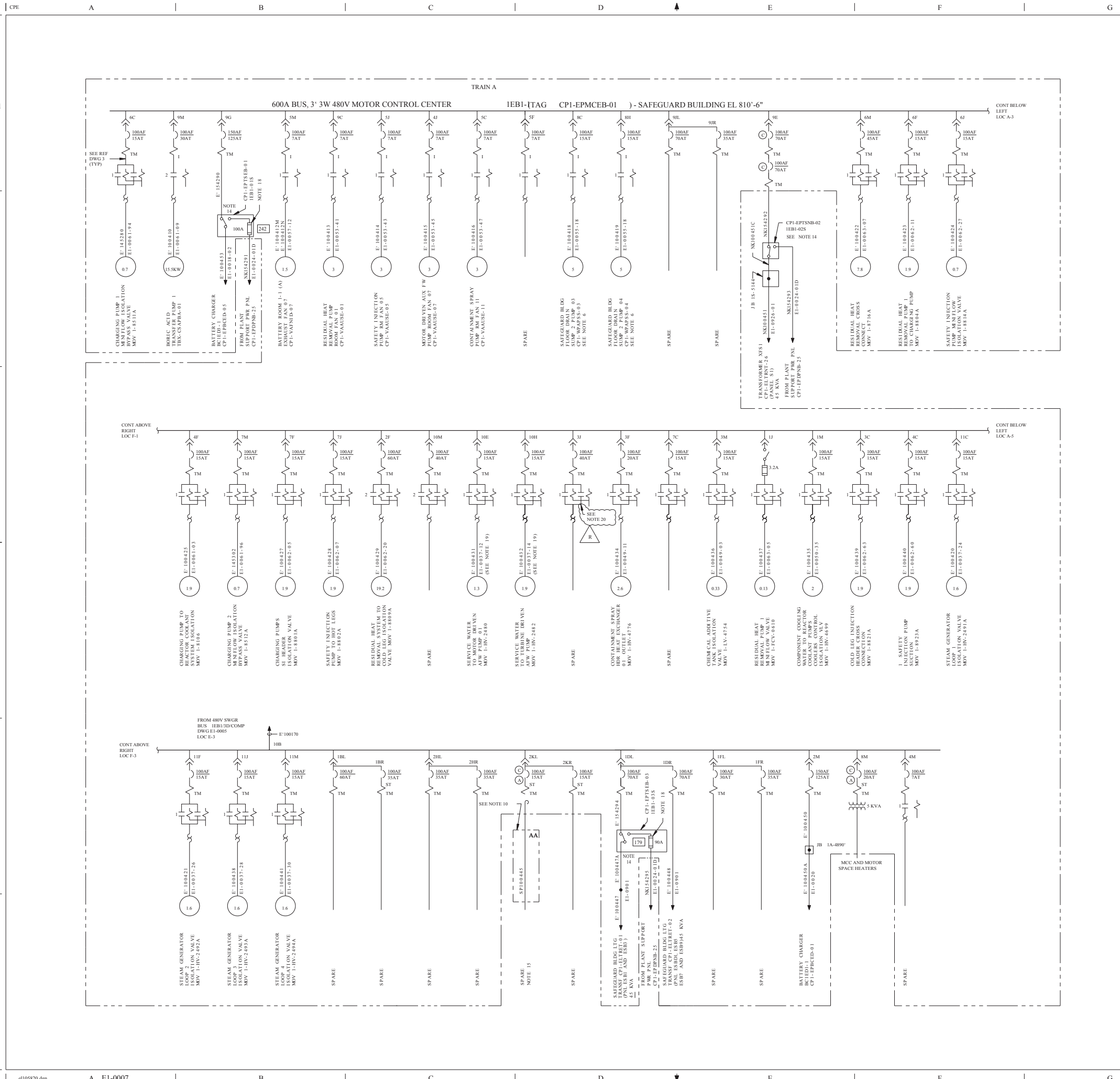
REF CSD 22579/CP-14

THIS DRAWING CANNOT BE ELECTRONICALLY









REV	DATE	BY	CHKD	APPD	REMARKS
CP-35	08/29/2011	08/29/2011			THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2010-00001-01-00 FOR 30-000-11-00001-01-00

**FSAR FIGURE 8.3-9**

- LEGEND:**
- 4C - MCC COMPARTMENT NUMBER
  - DRAWOUT BREAKER DISCONNECT
  - 3" CIRCUIT BREAKER
  - AF - BREAKER FRAME SIZE
  - AT - BREAKER TRIP RATING
  - 3" 30 AMP FUSED SWITCH WITH GOLD SHAWMUT TYPE TRIP-ONIC FUSES
  - 3.2A - 3.2 AMP FUSE RATING
  - MAGNETIC TRIP ELEMENT
  - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 12
  - TM - THERMAL MAGNETIC TRIP ELEMENT
  - ST - INDICATES BREAKER WITH SHUNT TRIP DEVICE
  - MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER
  - THERMAL OVERLOAD RELAY
  - MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
  - 2 - INDICATES MOTOR 2 HORSEPOWER
  - INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)
  - INDICATES SPLICE
  - SEE NOTE 16
  - SEE NOTE 16 AND 17
  - 90A 159 - FUSE
  - 90A - FUSE RATING
  - 159 - FUSE B/M ITEM NUMBER REF DWG 5

- NOTES:**
1. DELETED
  2. EQUIPMENT/CABLE ENCLOSED INSIDE DASHED LINE IS CLASS 1E, TRAIN A AND TRAIN B AS NOTED.
  3. DELETED
  4. DELETED
  5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  6. SAFEGUARD BUILDING FLOOR DRAIN SLUMP 1 AND SLUMP 2 PUMPS CPI-WPAPS-01.02 AND CPI-WPAPS-03.04 WILL HAVE ELECTRIC ALTERNATORS LOCATED IN THE MCC'S.
  7. DELETED
  8. DELETED
  9. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
  10. EQUIPMENT/CABLE ENCLOSED INSIDE DASHED LINE IS ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
  11. DELETED
  12. FOR BREAKERS O/LH SETTINGS SEE REFERENCE DRAWING 2.
  13. 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
  14. THIS TRANSFER SWITCH IS AN "OFF-LOAD TYPE" AND IS NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND PRE-REQUISITES FOR TRANSFER OF POWER ARE STATED IN DRD IE-041 "480V AND 120V AC ELECTRICAL POWER SYSTEM".
  15. ASSOCIATED SPARE CABLE SP10445 IS DETERMINATED AT BOTH ENDS: AT THE MCC AND AT THE MOTOR STARTER LOCATED IN PANEL CPI-EIPRLR-48.
  16. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY (C) NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY (A) NEXT TO THE BREAKER/STARTER AS FOLLOWS:
    - (A) - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS).
  17. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY (NE) TO THE BREAKER/FUSE.
  18. FUSES ARE NON-CLASS 1E.
  19. CIRCUIT BREAKER NORMALLY OPEN (ONLY REQUIRED IN MODES 1 THROUGH 4) FOR FSSA MODIFICATION. REFERENCE FDA-2010-000172-82.
  20. STARTER IS DEFECTIVE.

- REFERENCE DRAWINGS:**
1. E1-0001 PLANT ONE-LINE DIAGRAM UNITS 1 AND 2
  2. E1-2400 PROTECTIVE DEVICE SETTINGS
  3. E1-0007-D CONTROL POWER XFMR FUSE & CONTROL CIRCUIT LOADING DATA
  4. E1-0066-74 1-LINE SHIELDING SCHEMATIC DIAGRAM
  5. E1-0024-04 FUSE BILL OF MATERIAL

DRAWING NO.	2323-E1-0007	REV	CP-6
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS.			
E1-0007			
E1-0007-A			
E1-0007-B			
E1-0007-C			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT CPNPP**  
GLEN ROSE, TEXAS

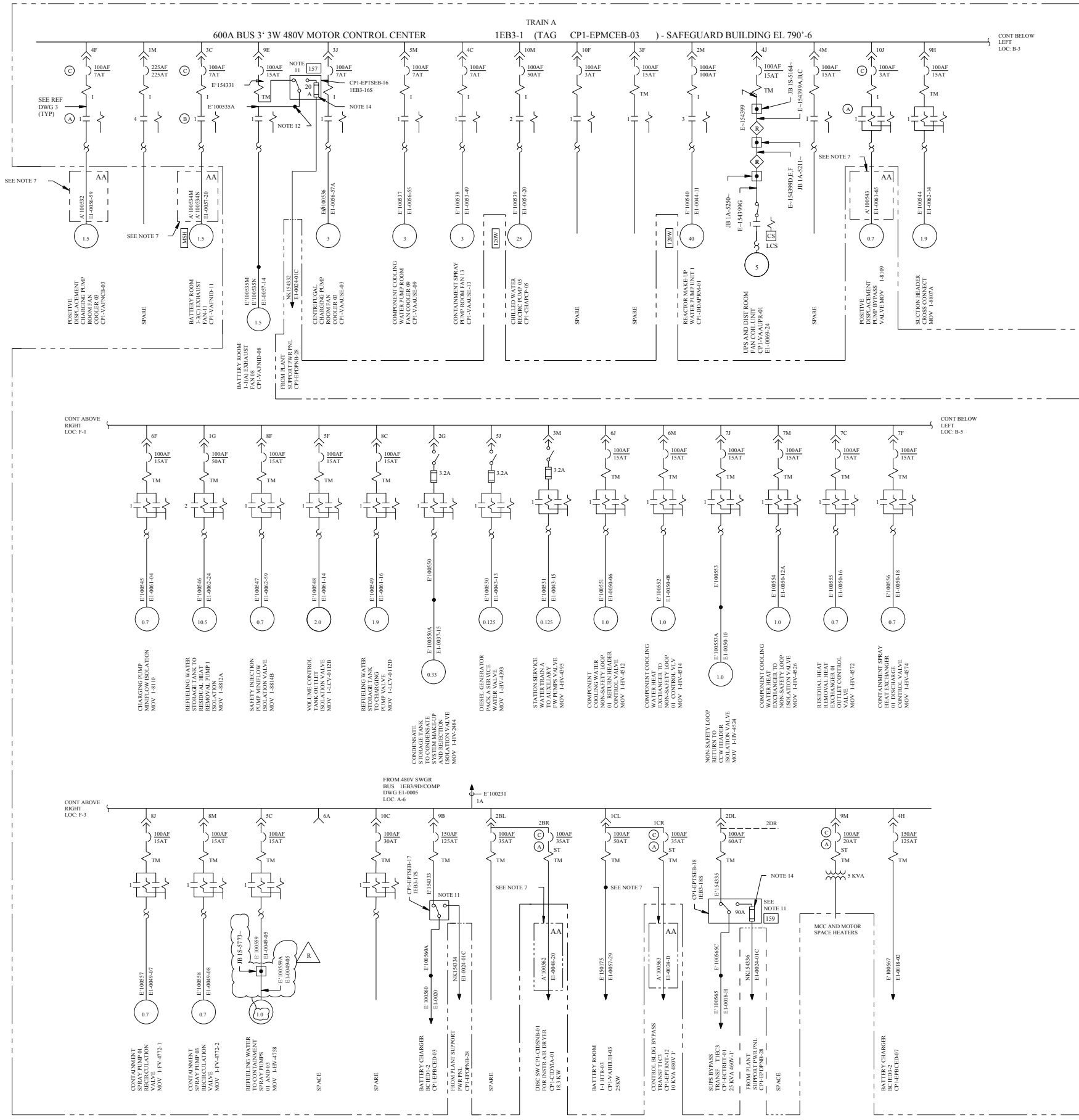
**SAFEGUARD AND AUXILIARY BUILDINGS**  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DWG NO. E1-0007 SH NO. - REV. CP-35

REF CKD CP-25 11/20/96

THIS DRAWING CREATED ELECTRONICALLY

FSAR FIGURE 8.3-9



- LEGEND
- INDICATES FIREZONE R CABLE INSTALLED TO PROVIDE A ONE HOUR FIRE BARRIER REQUIRED TO MEET FIRE SAFE SHUTDOWN ANALYSIS REQUIREMENTS
  - MCC COMPARTMENT NUMBER
  - DRAWOUT BREAKER DISCONNECT
  - 3" CIRCUIT BREAKER
  - AF-BREAKER FRAME SIZE
  - AT-BREAKER TRIP RATING
  - 3" 30 AMP FUSED SWITCH WITH GOULD-SHAWMUT TYPE TRI-ONIC FUSES
  - 2 AMP FUSE TRIP RATING
  - MAGNETIC TRIP ELEMENT
  - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 9
  - THERMAL MAGNETIC TRIP ELEMENT
  - INDICATES BREAKER WITH SHUNT TRIP DEVICE
  - MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER
  - THERMAL OVERLOAD RELAY
  - MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
  - INDICATES MOTOR 2 HORSEPOWER
  - MOTOR SPACE HEATER WITH "X" WATT RATING
  - INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)
  - INDICATES SPLICE
  - MOTOR SPACE HEATER
  - SEE NOTE 13
  - SEE NOTE 13
  - SEE NOTE 13
  - FUSE
  - FUSE RATING
  - FUSE B/M ITEM NUMBER REF DWG 5

- NOTES
1. DELETED
  2. ARE CLASS IE, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-CLASS IE, UNLESS NOTED.
  3. DELETED
  4. DELETED
  5. THERMAL OVERLOAD RELAYS FOR CLASS IE MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  6. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
  7. CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS IE, TRAIN A OR TRAIN B AS NOTED.
  8. DELETED
  9. FOR BREAKER OIL SETTINGS SEE REFERENCE DRAWING 2
  10. 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
  11. THIS TRANSFER SWITCH IS AN "OFF-LOAD TYPE" AND IS NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND PREREQUISITES FOR TRANSFER OF POWER ARE STATED IN DBO EE-047 "480V AND 120V AC ELECTRICAL POWER SYSTEM".
  12. SPLICE #4 AWG ONTO CABLE IN TRANSFER SWITCH ENCLOSURE. TERMINATE #4 AWG ONTO TRANSFER SWITCH.
  13. ISOLATION BETWEEN CLASS IE BUS AND NON-CLASS IE LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY OR NEXT TO THE BREAKER STARTER AS FOLLOWS:
    - (A) - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)
    - (B) - TRIPPED BY SAFETY INJECTION SEQUENCER AUTO LOCKOUT CONTACT (SISIAL)
  14. FUSES ARE NON-CLASS IE.

REFERENCE DRAWINGS

E1-0001	PLANT ONE LINE DIAGRAM UNITS 1 AND 2
E1-2400	PROTECTIVE DEVICE SETTINGS
E1-0007-D	CONTROL POWER XFMR FUSE & CONTROL CIRCUIT LOADING DATA
E1-0066-74	LOAD SHEDDING SCHEMATIC DIAGRAM
E1-0024-04	FUSE BILL OF MATERIAL

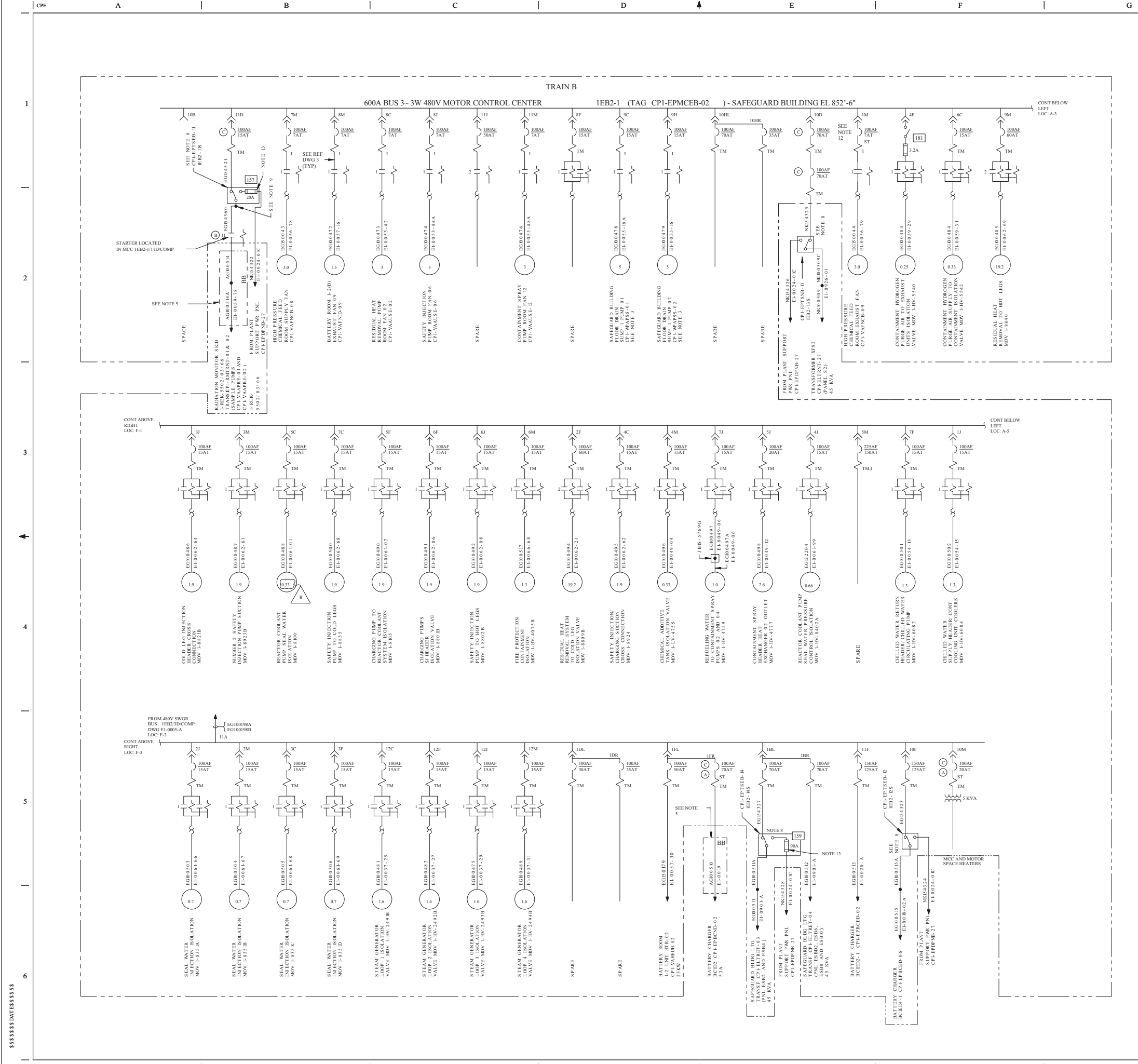
DRAWING 2323-E1-0007 REV CP-6  
 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

E1-0007	
E1-0007-A	
E1-0007-B	
E1-0007-C	

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1 SEISMIC CATEGORY I  
 SAFETY CLASS 2 CLASS IE ASSOCIATED CIRCUITS

**LUMINANT**  
 CPSES  
 GLEN ROSE, TEXAS

SAFE GUARD AND AUXILIARY BUILDINGS  
 SAFE GUARD 480V MCC'S  
 ONE LINE DIAGRAM



REV	DATE	BY	CHK	APPV	REMARKS
P-17	06/11/2011	GAW	06/11/2011		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2010-00172-75-00 PER SK-0004-10-00172-75-00.

**FSAR FIGURE 8.3-9**

**LEGEND**

- MCC COMPARTMENT NUMBER
- DRAWOUT BREAKER DISCONNECT
- 3-CIRCUIT BREAKER (UNLESS OTHERWISE NOTED)
- AF-BREAKER FRAME SIZE
- AT-BREAKER TRIP RATING
- 3-30 AMP FUSED SWITCH WITH GOULD SHAWMUT TYPE TRILONIC FUSES 3.2 AMP FUSE TRIP RATING
- MAGNETIC TRIP ELEMENT
- ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 6
- THERMAL MAGNETIC TRIP ELEMENT
- INDICATES BREAKER WITH SHUNT TRIP DEVICE
- MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER
- THERMAL OVERLOAD RELAY
- MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
- INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)
- INDICATES SPLICE
- 20A - FUSE RATING
- 157 - FUSE BM ITEM NUMBER REF DWG 4
- SEE NOTE 10
- SEE NOTE 10
- SEE NOTE 10 AND 11

**NOTES**

- EQUIPMENT CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E. TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E. UON.
- THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
- SAFEGUARD BUILDING FLOOR DRAIN SUMP 1 AND SUMP 2 PUMPS CPl-WPAPSS-01 AND CPl-WPAPSS-02 WILL HAVE ELECTRIC ALTERNATORS LOCATED IN THE MCCS.
- INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
- CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E. TRAIN AA OR TRAIN BB AS NOTED.
- FOR BREAKER/OLH SETTINGS SEE REFERENCE DRAWING 2.
- 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
- THIS TRANSFER SWITCH IS AN "OFF-LOAD TYPE" AND IS NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND PREREQUISITES FOR TRANSFER OF POWER ARE STATED IN DBD EE-041 548V AND 120V AC ELECTRICAL POWER SYSTEM.
- SPLICE #4 AWG ONTO CABLE IN TRANSFER SWITCH ENCLOSURE. TERMINATE #4 AWG ONTO TRANSFER SWITCH.
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BUS UPSTREAM CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY OR NEXT TO THE BREAKER/STARTER AS FOLLOWS:
  - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)
  - TRIPPED BY SAFETY INJECTION SEQUENCER AUTO LOCKOUT CONTACT (SISAL)
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER/FUSE.
- THE BREAKER IS TRIPPED BY SHUNT TRIP ACTUATION IF THE EXHAUST FAN CPl-VAFNCB-09 IS RUNNING AND SUPPLY FAN CPl-VAFNCB-48 IS TRIPPED. THE BREAKER IS REQUIRED TO BE MANUALLY CLOSED AFTER SHUNT TRIP.
- FUSES ARE NON-CLASS 1E.

**REFERENCE DRAWINGS**

- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
- E1-2400 PROTECTIVE DEVICE SETTING
- E1-0007-E CONTROL POWER XPMR FUSE AND CONTROL CIRCUIT LOADING DATA
- E2-0024-04 FUSE BILL OF MATERIAL
- E1-0066-76 LOAD SHEDDING SCHEMATIC DIAGRAM

DRAWING NO.	2323-E1-0007	REV	CP-6
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0007			
E1-0007-A			
E1-0007-B			
E1-0007-C			

**TRAIN B**

**CLASS 1E**

(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY 1  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

**SAFEGUARD AND AUXILIARY BUILDINGS**  
**SAFEGUARD 480V MCC'S**  
**ONE LINE DIAGRAM**

DWG NO.	E1-0007	SH NO.	B	REV.	CP-37
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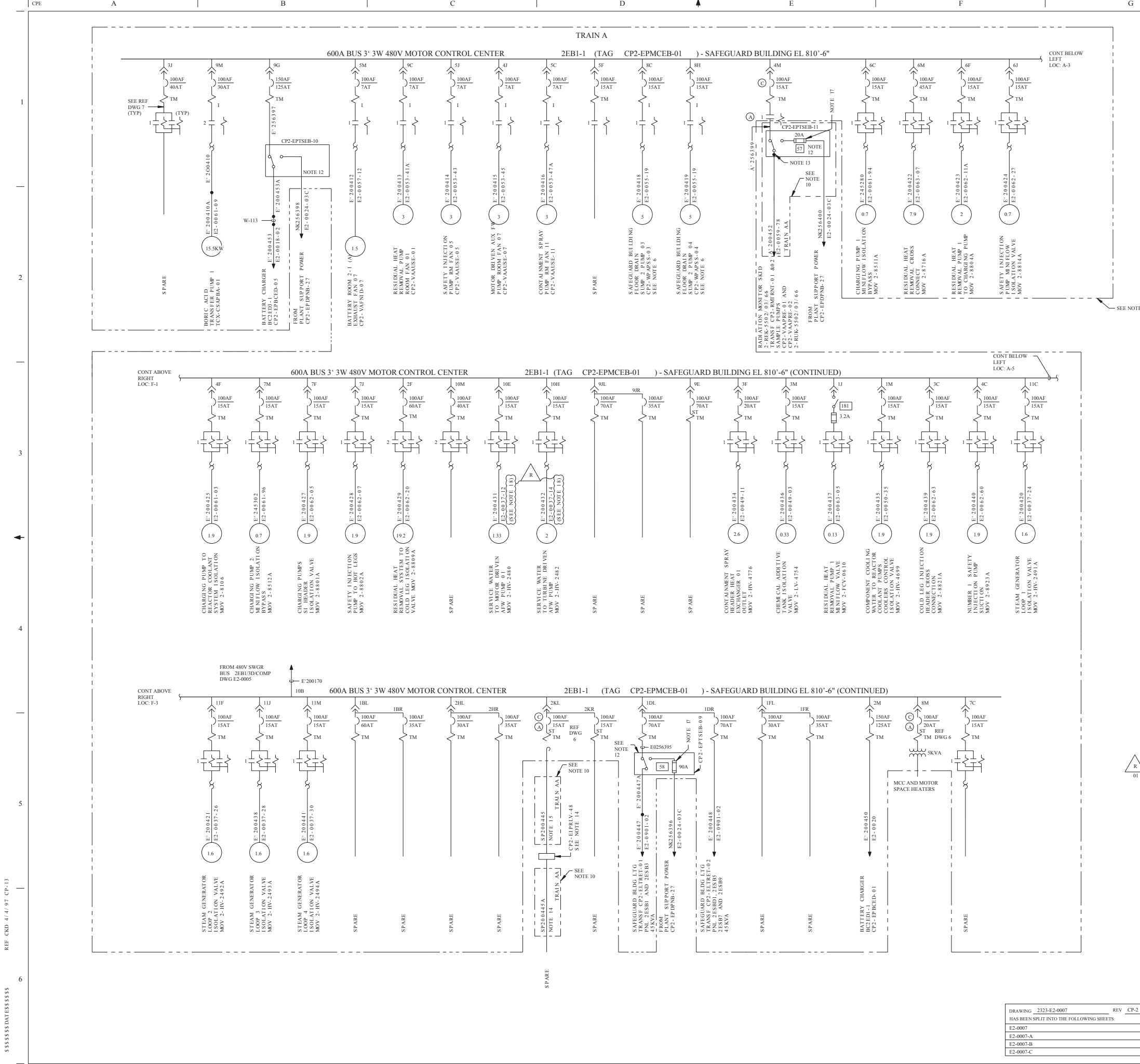
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\$\$\$\$\$DATE\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY



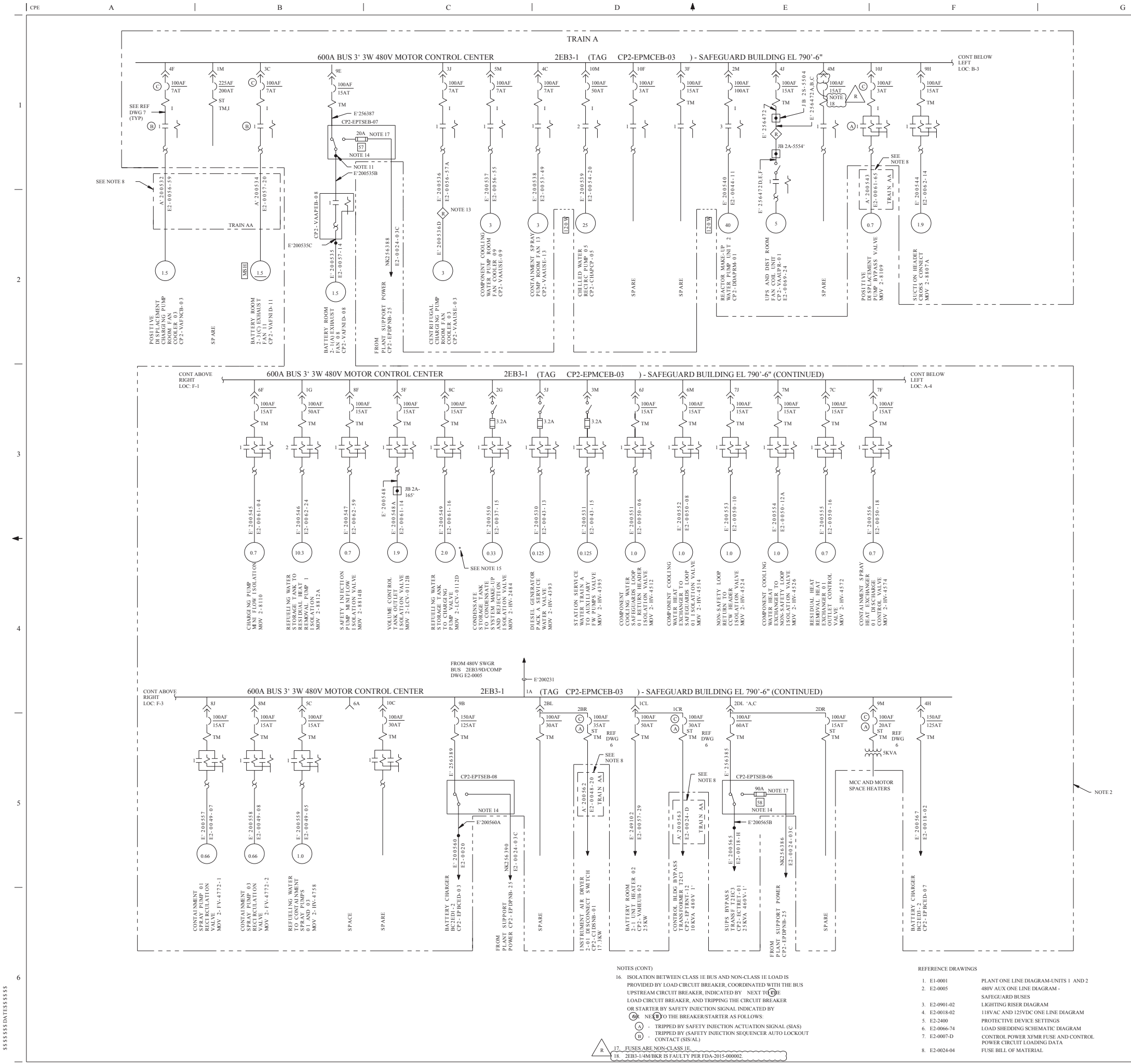




REV	DWN	CHK	HAPVD	REMARKS
CP-27	1/4 8-22 201	GAW 8-22 201		THIS DRAWING REVISION TO INCORPORATE DESIGN CHANGE FDA-2010-000172-01 PER 98.004-10-000172-01
<b>FSAR FIGURE 8.3-9</b>				
<p>LEGEND:</p> <ul style="list-style-type: none"> <li> - INDICATES SPLICE</li> <li> - MCC COMPARTMENT NUMBER 2C DRAWOUT BREAKER DISCONNECT</li> <li> - 3-CIRCUIT BREAKER</li> <li> AF - BREAKER FRAME SIZE</li> <li> AT - BREAKER TRIP RATING</li> <li> - MAGNETIC TRIP ELEMENT ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP. SEE NOTE 8</li> <li> - THERMAL MAGNETIC TRIP ELEMENT</li> <li> - INDICATES BREAKER WITH SHUNT TRIP DEVICE</li> <li> - MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER</li> <li> - THERMAL OVERLOAD RELAY</li> <li> - MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER</li> <li> - INDICATES MOTOR 2 HORSEPOWER</li> <li> - INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)</li> <li> - FUSE</li> <li> 20A - FUSE RATING</li> <li> 57 - FUSE BM ITEM NUMBER REF DWG 8</li> <li> - SEE NOTE 16</li> <li> - SEE NOTE 16</li> </ul> <p>NOTES:</p> <ol style="list-style-type: none"> <li>1. ALL MOTOR AND FEEDER RATINGS ARE GIVEN IN HORSEPOWER UNLESS OTHERWISE NOTED.</li> <li>2.  - EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.</li> <li>3. DELETED</li> <li>4. DELETED</li> <li>5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.</li> <li>6. SAFEGUARD BUILDING FLOOR DRAIN SUMP 1 AND SUMP 2 PUMPS CP2-WPAPS-03 AND CP2-WPAPS-04 WILL HAVE ELECTRIC ALTERNATORS LOCATED IN THE MCCS.</li> <li>7. DELETED</li> <li>8. FOR BREAKER/OLH SETTINGS SEE REFERENCE DRAWING 5.</li> <li>9. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.</li> <li>10.  - CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.</li> <li>11. DELETED</li> <li>12. TRANSFER SWITCH NORMALLY ALIGNED TO MCC AND ONLY ALIGNED TO PLANT SUPPORT POWER DURING OUTAGE. PRE-REQUISITES AND REQUIREMENTS FOR ALIGNING TO PLANT SUPPORT POWER ARE IN DBD-EE-041 "480V AND 120V AC ELECTRICAL POWER SYSTEM."</li> <li>13. SPLICE #4 AWG ONTO CABLE IN TRANSFER SWITCH ENCLOSURE. TERMINATE #4 AWG ONTO TRANSFER SWITCH.</li> <li>14. ASSOCIATED SPARE CABLE SP200445A IS DETERMINATED AT THE STARTER LOCATED IN PANEL CP2-EIPRLV-48 AND AT THE MOTOR TERMINAL.</li> <li>15. ASSOCIATED SPARE CABLE SP200445 IS DETERMINATED AT BOTH ENDS 1/2 AT MCC AND AT MOTOR STARTER LOCATED IN PANEL CP2-EIPRLV-48.</li> <li>16. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY  NEXT TO THE BREAKER/STARTER AS FOLLOWS: <ul style="list-style-type: none"> <li> - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)</li> </ul> </li> <li>17. FUSES ARE NON-CLASS 1E.</li> <li>18.  - CIRCUIT BREAKER NORMALLY OPEN (ONLY REQUIRED IN MODES 1 THROUGH 4) PER ILSA MODIFICATION REFERENCE: FDA-2010-000172-02.</li> </ol> <p>REFERENCE DRAWINGS:</p> <ol style="list-style-type: none"> <li>1. E1-0001 PLANT ONE LINE DIAGRAM-UNITS 1 AND 2</li> <li>2. E2-0005 480V AUX ONE LINE DIAGRAM - SAFEGUARD BUSES</li> <li>3. E2-0901-02 LIGHTING RISER DIAGRAM</li> <li>4. E2-0018-02 118VAC AND 125VDC ONE LINE DIAGRAM</li> <li>5. E2-2400 PROTECTIVE DEVICE SETTINGS</li> <li>6. E2-0066-74 LOAD SHEDDING SCHEMATIC DIAGRAM</li> <li>7. E2-0007-D CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA</li> <li>8. E2-0024-04 FUSE BILL OF MATERIAL</li> </ol>				
<b>TRAIN A</b>				
<b>CLASS I</b>				
(NUCLEAR SAFETY-RELATED)				
SAFETY CLASS 1		SERVIC. CATEGORY 1		
SAFETY CLASS 2		SAFETY CLASS 1		
SAFETY CLASS 3		ASSOCIATED CIRCUITS		
<b>LUMINANT</b>				
<b>CPNPP</b>				
<b>GLEN ROSE, TEXAS</b>				
<b>SAFEGUARD AND AUXILIARY BUILDINGS</b>				
<b>SAFEGUARD 480V MCC'S</b>				
<b>ONE LINE DIAGRAM</b>				
DWG NO	REV	REV	REV	REV
E2-0007	-	-	-	-
E2-0007-A	-	-	-	-
E2-0007-B	-	-	-	-
E2-0007-C	-	-	-	-
DRAWING 2322-E2-0007 REV CP-2				
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:				
E2-0007				
E2-0007-A				
E2-0007-B				
E2-0007-C				

REF CKD 4/1/97 CP-13

THIS DRAWING CREATED ELECTRONICALLY



REV	OWN	CHK	APPV	REMARKS
CP-27	106	106	106	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE PER 2015-000002-01-08 PER 30-0001-15-00002-01-08

FSAR FIGURE 8.3-9

**LEGEND**

- INDICATES SPLICE
- MCC COMPARTMENT NUMBER 2C DRAWOUT BREAKER DISCONNECT
- 3" CIRCUIT BREAKER
- AF - BREAKER FRAME SIZE
- AT - BREAKER TRIP RATING
- 3", 30 AMP FUSED SWITCH WITH 2 AMP FUSE TRIP RATING
- MAGNETIC TRIP ELEMENT, ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP (SEE NOTE 10)
- THERMAL MAGNETIC TRIP ELEMENT
- INDICATES BREAKER WITH SHUNT TRIP DEVICE
- MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER
- THERMAL OVERLOAD RELAY
- MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
- INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)
- FUSE
- 10A - FUSE RATING
- 57 - FUSE B/M ITEM NUMBER REF DWG 8
- INDICATES FIRE ZONE R CABLE INSTALLED TO PROVIDE A ONE HOUR FIRE BARRIER REQUIRED TO MEET FIRE SAFE SHUTDOWN ANALYSIS REQUIREMENTS
- MOTOR SPACE HEATER WITH "X" WATT RATING
- MOTOR SPACE HEATER
- FEEDER TO LOCAL PANEL, STARTER OR CONTACTOR AT EQUIPMENT
- SEE NOTE 16
- SEE NOTE 16
- SEE NOTE 16

**NOTES**

1. ALL MOTOR AND FEEDER RATINGS ARE GIVEN IN HORSEPOWER UNLESS OTHERWISE NOTED.
2. - - - - - EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
3. DELETED
4. DELETED
5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES
6. DELETED
7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES
8. - - - - - CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
9. DELETED
10. FOR BREAKER/OLH SETTINGS SEE REFERENCE DRAWING 5.
11. SPLICE #4 AWG ONTO CABLE IN TRANSFER SWITCH ENCLOSURE. TERMINATE #4 AWG ONTO TRANSFER SWITCH.
12. DELETED
13. FIRE ZONE R CABLES (E:200536A, B AND C) SPLICED IN TWO PLACES. SEE DRAWING E2-0056-57A FOR DETAILS.
14. TRANSFER SWITCH NORMALLY ALIGNED TO MCC AND ONLY ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. PREREQUISITES AND REQUIREMENTS FOR ALIGNING TO PLANT SUPPORT POWER ARE IN DBD-EE-041 "480V AND 120V AC ELECTRICAL POWER SYSTEM."
15. ALL MOTORS ARE RATED 460V EXCEPT FOR MOTORS MARKED WITH \* SIGN, WHICH HAVE A 480V RATING.

DRAWING 2233-E2-0007	REV CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0007	
E2-0007-A	
E2-0007-B	
E2-0007-C	

TRAIN A

CLASS I

(NUCLEAR SAFETY RELATED)

SAFETY CLASS 1	SEVERITY CATEGORY I
SAFETY CLASS 2	CLASS 1E
SAFETY CLASS 3	ASSOCIATED CIRCUITS

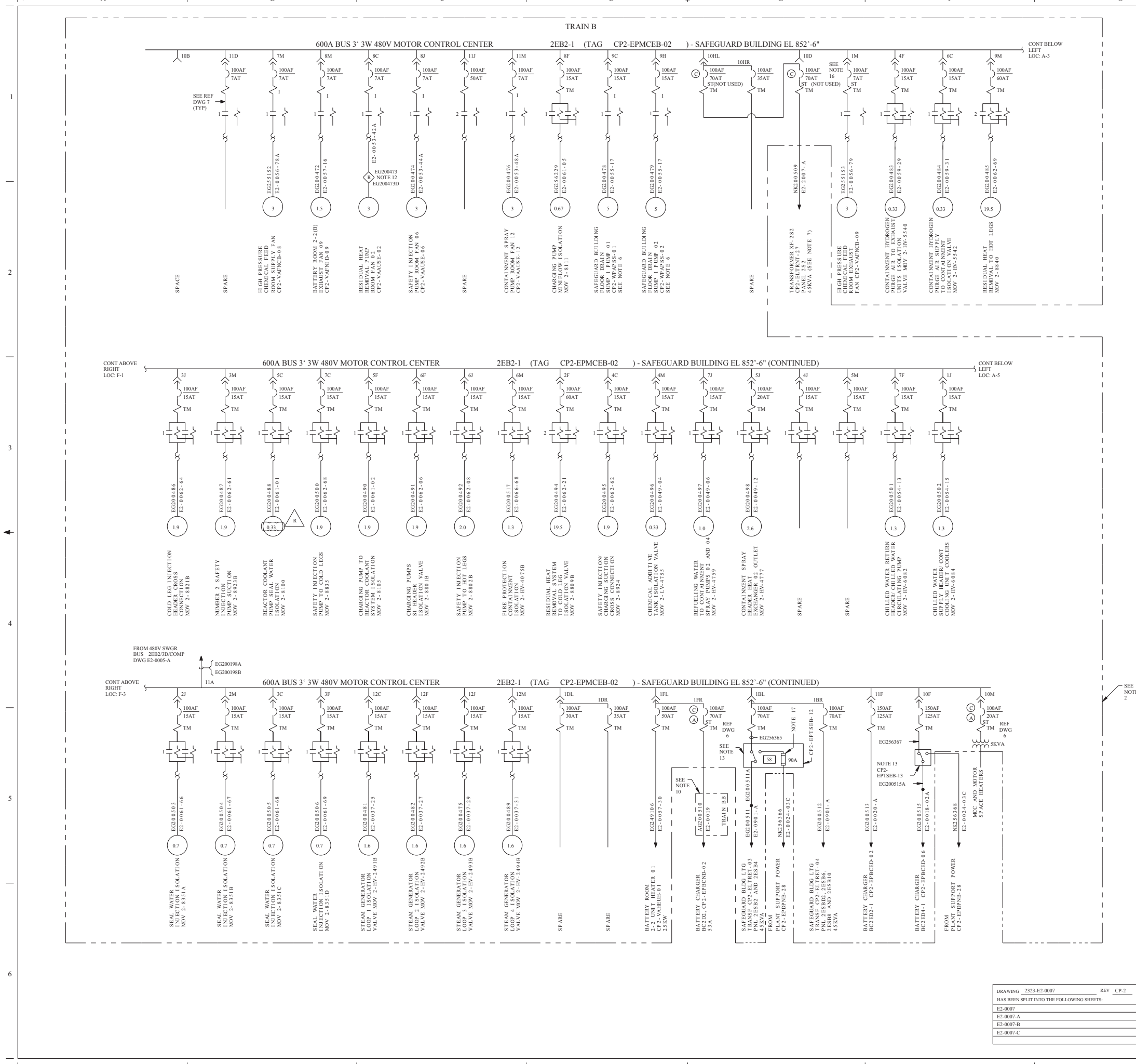
LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

SAFEGUARD AND AUXILIARY BUILDINGS  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DWG. NO. E2-0007      SHEET NO. A      REV. CP-27

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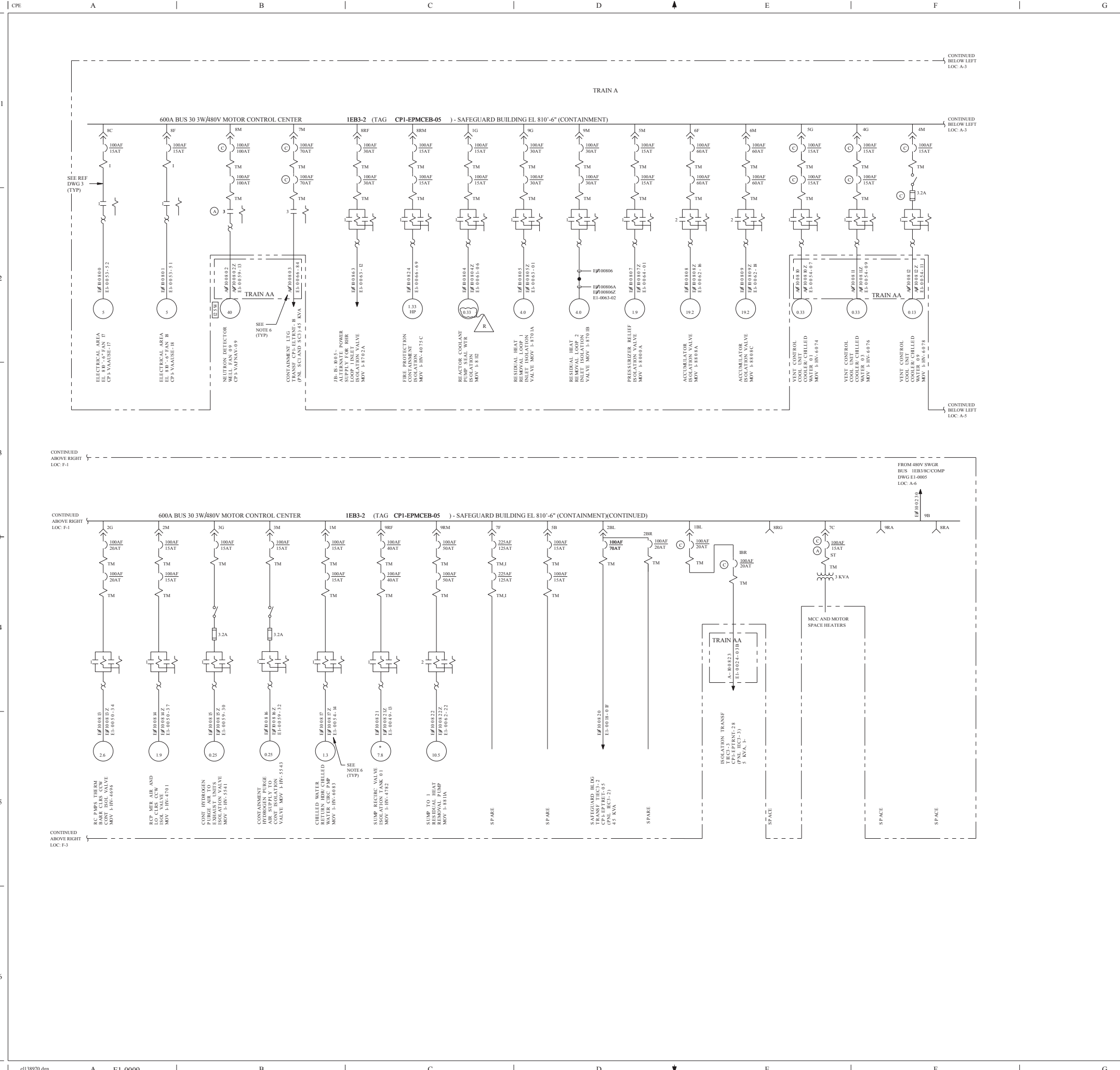


REV	DWN	CHK	APPV	REMARKS												
CP-21	EIS 06/23/2011	MPB 06/23/2011		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2010-000172-76-00 PER 38-0004-10-000172-76-00												
<b>FSAR FIGURE 8.3-9</b>																
<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li> - MCC COMPARTMENT NUMBER 2C DRAWOUT BREAKER DISCONNECT</li> <li> - 3' CIRCUIT BREAKER</li> <li> AF - BREAKER FRAME SIZE</li> <li> AT - BREAKER TRIP RATING</li> <li> - INDICATES FIREZONE "R" CABLE INSTALLED TO PROVIDE A ONE HOUR FIRE BARRIER REQUIRED TO MEET FIRE SAFE SHUTDOWN ANALYSIS REQUIREMENTS</li> <li> - MAGNETIC TRIP ELEMENT, ADJUSTABLE</li> <li> - INSTANTANEOUS MAGNETIC (SEE NOTE 11)</li> <li> - THERMAL MAGNETIC TRIP ELEMENT</li> <li> ST - INDICATES BREAKER WITH SHUNT TRIP DEVICE</li> <li> - MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER</li> <li> - MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER</li> <li> - INDICATES MOTOR 2 HORSEPOWER</li> <li> - INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)</li> <li> - INDICATES SPLICE</li> <li> - FUSE</li> <li> 90A - FUSE RATING</li> <li> [SS] - FUSE B/M ITEM NUMBER, REF DWG 8</li> <li> - SEE NOTE 14</li> <li> - SEE NOTE 14 AND 15</li> </ul> <p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>1. ALL MOTOR AND FEEDER RATINGS ARE GIVEN IN HORSEPOWER UNLESS OTHERWISE NOTED.</li> <li>2. - - - - - EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, 10N.</li> <li>3. DELETED.</li> <li>4. DELETED.</li> <li>5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.</li> <li>6. SAFEGUARD BUILDING FLOOR DRAIN SUMP 1 AND SUMP 2 PUMPS CP2-WPAPSS-01 AND CP2-WPAPSS-02 WILL HAVE ELECTRICAL ALTERNATORS LOCATED IN THE MCCS.</li> <li>7. THE FIELD POWER CABLE SHALL BE ROUTED IN CONDUIT UP TO THE BREAKER TERMINALS WHERE DESIGNATED BY NOTE 7.</li> <li>8. DELETED.</li> <li>9. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.</li> <li>10. - - - - - CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.</li> <li>11. FOR BREAKER/OLH SETTINGS SEE REFERENCE DRAWING 5.</li> <li>12. FIREZONE "R" CABLES (EG200473A, B AND C) SPLICED IN TWO PLACES. SEE DWG EG-20053-2A FOR DETAILS.</li> <li>13. TRANSFER SWITCH NORMALLY ALIGNED TO MCC AND ONLY ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. PREREQUISITES AND REQUIREMENTS FOR ALIGNING TO PLANT SUPPORT POWER ARE IN DBD-EE-041 "480V AND 120V AC ELECTRICAL POWER SYSTEM".</li> <li>14. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY (SIAS) NEXT TO THE BREAKER/STARTER AS FOLLOWS:             <ul style="list-style-type: none"> <li>(A) - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)</li> </ul> </li> <li>15. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER/FUSE.</li> <li>16. THE BREAKER IS TRIPPED BY SHUNT TRIP ACTUATION IF THE EXHAUST FAN CP2-VAFNCRB-09 IS RUNNING AND SUPPLY FAN CP2-VAFNCRB-08 IS TRIPPED. THE BREAKER IS REQUIRED TO BE MANUALLY CLOSED AFTER SHUNT TRIP.</li> <li>17. FUSES ARE NON-CLASS 1E.</li> </ol> <p><b>REFERENCE DRAWING</b></p> <ol style="list-style-type: none"> <li>1. E1-0001 PLANT ONE LINE DIAGRAM-UNITS 1 AND 2</li> <li>2. E2-0005-A 480V AUX ONE LINE DIAGRAM - SAFEGUARD BUSES</li> <li>3. E2-0901-02 LIGHTING RISER DIAGRAM</li> <li>4. E2-0018-02 118VAC AND 125VDC ONE LINE DIAGRAM</li> <li>5. E2-2400 PROTECTIVE DEVICE SETTINGS</li> <li>6. E2-0066-76 LOAD SHEDDING SCHEMATIC DIAGRAM</li> <li>7. E2-0007-E CONTROL POWER TRIP FUSE AND CONTROL CIRCUIT LOADING DATA</li> <li>8. E2-0024-04 FUSE BILL OF MATERIAL</li> </ol>																
<b>CLASS I</b> (NUCLEAR SAFETY-RELATED)																
SAFETY CLASS 1		SIBS/CATEGORY I														
SAFETY CLASS 2		CLASS II														
SAFETY CLASS 3		ASSOCIATED CIRCUITS														
<b>LUMINANT CPNPP</b> GLEN ROSE, TEXAS																
SAFEGUARD AND AUXILIARY BUILDINGS SAFEGUARD 480V MCC'S ONE LINE DIAGRAM																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">DRAWING 2323-E2-0007</td> <td style="width: 40%;">REV CP-2</td> </tr> <tr> <td colspan="2">HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:</td> </tr> <tr> <td>E2-0007</td> <td></td> </tr> <tr> <td>E2-0007-A</td> <td></td> </tr> <tr> <td>E2-0007-B</td> <td></td> </tr> <tr> <td>E2-0007-C</td> <td></td> </tr> </table>					DRAWING 2323-E2-0007	REV CP-2	HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:		E2-0007		E2-0007-A		E2-0007-B		E2-0007-C	
DRAWING 2323-E2-0007	REV CP-2															
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:																
E2-0007																
E2-0007-A																
E2-0007-B																
E2-0007-C																
DWG. NO. E2-0007	SH. NO. B	REV. CP-21														

\$\$\$\$\$\$\$\$\$DATE\$\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY





REV	OWN	CHK	APPV	REMARKS
CP-27	SM	GAW	10/31/2011	THIS DRAWING REVISION TO INCORPORATE DESIGN CHANGE: FDA-2010-000172-75-00 PER SK-0001-10-000172-75-00

FSAR FIGURE 8.3-10

**LEGEND**

- 2M - MCC COMPARTMENT NUMBER
- DRAWOUT BREAKER DISCONNECT
- 30/30 AMP FUSED SWITCH WITH GOULD SHAWMUT TYPE TRI-IONIC FUSES  
3.2 AMP FUSE TRIP RATING
- 30 - 30 CIRCUIT BREAKER  
AF - BREAKER FRAME SIZE  
AT - BREAKER TRIP RATING
- MAGNETIC TRIP ELEMENT  
ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP  
SEE NOTE 10
- TM - THERMAL MAGNETIC TRIP ELEMENT
- MOTOR STARTER COIL AND CONTACT (NON-REVERSING)
- NEMA SIZE 2 STARTER
- THERMAL OVERLOAD RELAY
- MOTOR STARTER COILS AND CONTACTS (REVERSING)
- NEMA SIZE 1 STARTER
- INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 480-240/120V  
1 PHASE (FOR SPACE HEATER)
- MOTOR SPACE HEATER WITH "X" WATT RATING
- INDICATES SPLICE
- ST - INDICATES BREAKER WITH SHUNT TRIP DEVICE
- SEE NOTE 13
- SEE NOTE 14

**NOTES**

1. DELETED
2. - - - - - EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS IE, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-IE, UON.
3. DELETED
4. DELETED
5. THERMAL OVERLOAD RELAYS FOR CLASS IE MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
6. NUMBERS SHOWN ON LINES BETWEEN MCC AND THE LOAD IT IS SUPPLYING ARE CABLE NUMBERS (eg A-10080). CABLE NUMBERS HAVING Z SUFFIX (eg E-100817Z) ARE CABLE NUMBERS FOR RUNS FROM THE ELECTRICAL PENETRATION TO THE LOAD INSIDE THE REACTOR CONTAINMENT.
7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
8. - - - - - CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS IE, TRAIN AA OR TRAIN BB AS NOTED.
9. DELETED
10. FOR BREAKER/OLH SETTING SEE REFERENCE DRAWING 2.
11. 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
12. ALL MOTORS ARE RATED 460 VAC EXCEPT FOR MOTORS MARKED WITH \* SIGN WHICH HAVE 480 VAC VOLTAGE RATING.
13. ISOLATION BETWEEN CLASS IE BUS AND NON-CLASS IE LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY NEXT TO THE BREAKER STARTER AS FOLLOWS:  
 - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)
14. ISOLATION BETWEEN CLASS IE BUS AND NON-CLASS IE LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER FUSE.

**REFERENCE DRAWINGS**

1. EI-0001	PLANT ONE LINE DIAGRAM UNITS 1 AND 2
2. EI-2400	PROTECTIVE DEVICE SETTINGS
3. EI-0009-B	CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA
4. EI-0066-74	LOAD SHEDDING SCHEMATIC DIAGRAM

DRAWING: 2223-EI-0009      REV: CP-3

HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

EI-0009	
EI-0009-A	

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1      SEISMIC CATEGORY I  
 SAFETY CLASS 2      CLASS IE  
 SAFETY CLASS 3      ASSOCIATED CIRCUITS

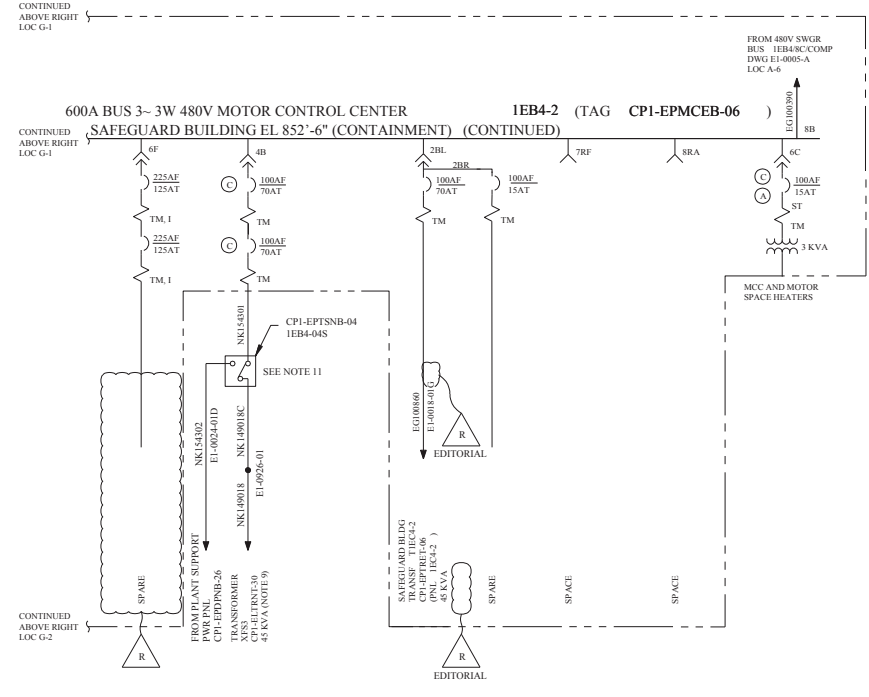
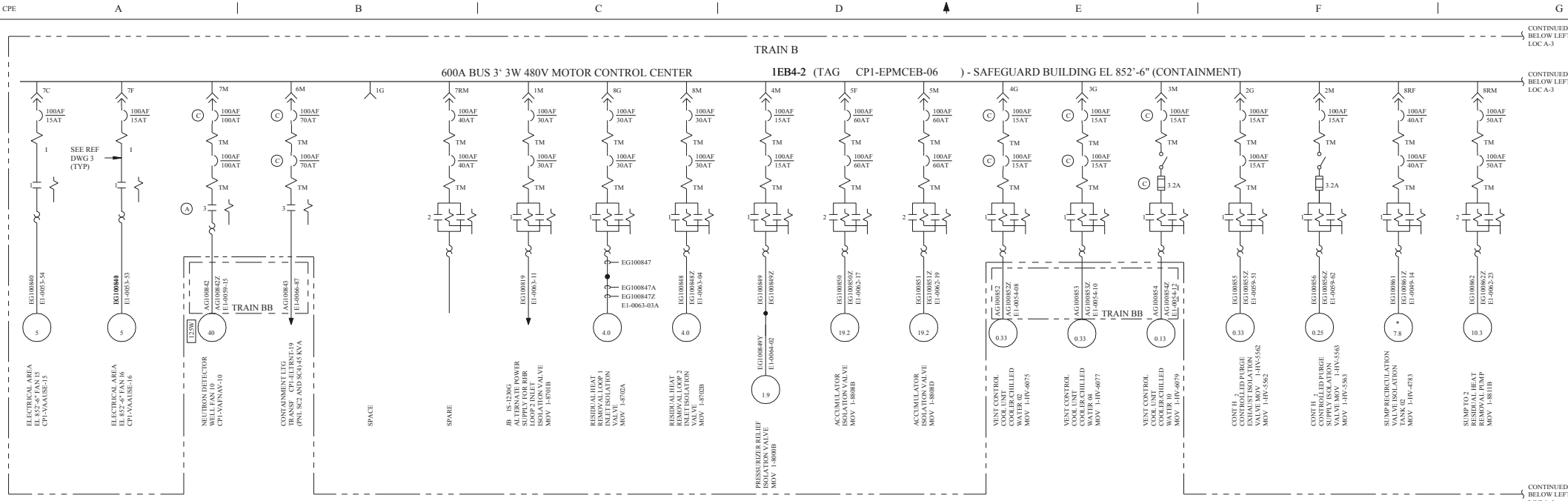
**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

**CONTAINMENT AND DIESEL GENERATOR**  
**SAFEGUARD 480V MCC'S**  
**ONE LINE DIAGRAM**

DWG. NO. <b>EI-0009</b>	SH. NO. -	REV. <b>CP-27</b>
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\$\$\$\$\$DATE\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY



REV	DATE	BY	CHKD	APPV	REMARKS
CP-24	01-22-2006	DL	RSK	DL	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-002063-01-00 PER SC-0006-04-002063-01-00 EDITORIAL CHANGES AS NOTED

**FSAR FIGURE 8.3-10**

- LEGEND**
- MCC COMPARTMENT NUMBER
  - DRAWOUT BREAKER DISCONNECT
  - 30 AMP FUSED SWITCH WITH 3.2A FUSE TRIP RATING
  - 3 POLE CIRCUIT BREAKER
  - AF-BREAKER FRAME SIZE
  - AT-BREAKER TRIP RATING
  - MAGNETIC TRIP ELEMENT
  - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 10
  - THERMAL MAGNETIC TRIP ELEMENT
  - MOTOR STARTER COIL AND CONTACT (NON-REVERSING)
  - NEMA SIZE 2 STARTER
  - THERMAL OVERLOAD RELAY
  - MOTOR STARTER COILS AND CONTACTS (REVERSING)
  - NEMA SIZE 1 STARTER
  - INDICATES MOTOR 2 HORSEPOWER
  - INDICATES DISTRIBUTION TRANSFORMER 480-240/120V 1 PHASE (FOR SPACE HEATER)
  - MOTOR SPACE HEATER WITH "X" WATT RATING
  - ST - INDICATES BREAKER WITH SHUNT TRIP DEVICE
  - INDICATES SPLICE
  - SEE NOTE 14
  - SEE NOTE 14 AND 15

- NOTES**
1. DELETED
  2. DELETED
  3. DELETED
  4. DELETED
  5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  6. NUMBERS SHOWN ON LINES BETWEEN MCC AND THE LOAD IT IS SUPPLYING ARE CABLE NUMBERS (eg A0100803). CABLE NUMBERS HAVING Z SUFFIX (eg E0100817Z) ARE CABLE NUMBERS FOR RUNS FROM THE ELECTRICAL PENETRATION TO THE LOAD INSIDE THE REACTOR CONTAINMENT.
  7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
  8. CABLES ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN A OR TRAIN BB AS NOTED.
  9. FIELD POWER CABLE SHALL BE ROUTED IN CONDUIT. CONSTRUCTION TO WRAP CABLE PER 2323-ES-100 SPECIFICATION, APPENDIX F SKETCHES 16345-E-129 OR 16345-E-130, OR INSTALL A FLEX PER 2323-ES-100 APPENDIX F SKETCH 16345-E-119.
  10. FOR BREAKER OIL SETTINGS SEE REFERENCE DRAWING 2.
  11. 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
  12. THIS TRANSFER SWITCH IS AN "OFF-LOAD TYPE" AND IS NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND PREREQUISITES FOR TRANSFER OF POWER ARE STATED IN DBD EE-041 "480V AND 120V AC ELECTRICAL POWER SYSTEM."
  13. \* - ALL MOTORS ARE RATED 460 VAC EXCEPT FOR MOTORS MARKED WITH " \* " SIGN WHICH HAVE 480 VAC VOLTAGE RATING.
  14. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY NEXT TO THE BREAKER/STARTER AS FOLLOWS:  
 - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)
  15. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER/FUSE.

**REFERENCE DRAWINGS**

1. E1-0001	PLANT ONE LINE DIAGRAM UNITS 1 AND 2
2. E1-2400	PROTECTIVE DEVICE SETTINGS
3. E1-0009-C	CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA
4. E1-0066-76	LOAD SHEDDING SCHEMATIC DIAGRAM
5. E1-0066-82	LOAD SHEDDING SCHEMATIC DIAGRAM
6. E1-0067-38	AUX RELAYS SCHEMATIC DIAGRAM

DRAWING	E1-0009-A	REV	CP-11
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0009			
E1-0009-A			
E1-0009-B			
E1-0009-C			

**CLASS I**  
 (NUCLEAR SAFETY-RELATED)  
 SAFETY CLASS 1 SUBSYSTEM CATEGORY I  
 SAFETY CLASS 2 CLASS 1E ASSOCIATED CIRCUITS  
 SAFETY CLASS 3

**LUMINANT CPNPP**  
 GLEN ROSE, TEXAS

**CONTAINMENT AND DIESEL GENERATOR SAFEGUARD 480V MCC'S ONE LINE DIAGRAM**

THIS DRAWING CREATED ELECTRONICALLY

REV	BY	CHKD	APPV	REMARKS
CP-8	SM	10-05	2003	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2002-003739-01-00 PER 36-0016-02-003739-01-00

**FSAR FIGURE 8.3-10**

**LEGEND**

- MCC COMPARTMENT NUMBER
- DRAWOUT BREAKER DISCONNECT
- 3" 30AMP FUSED SWITCH WITH 3 2A FUSE TRIP RATING
- 3" CIRCUIT BREAKER  
AF-BREAKER FRAME SIZE  
AT-BREAKER TRIP RATING
- MAGNETIC TRIP ELEMENT  
ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 10
- THERMAL MAGNETIC TRIP ELEMENT
- MOTOR STARTER COIL AND CONTACT (NON-REVERSING)  
NEMA SIZE 2 STARTER
- THERMAL OVERLOAD RELAY
- MOTOR STARTER COILS AND CONTACTS (REVERSING)  
NEMA SIZE 1 STARTER
- INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 480-240/120V  
1 PHASE (FOR SPACE HEATER)
- MOTOR SPACE HEATER WITH "X" WATT RATING
- INDICATES BREAKER WITH SHUNT TRIP DEVICE
- INDICATES SPLICE
- SEE NOTE 14
- SEE NOTE 14
- SEE NOTE 14

**NOTES**

1. DELETED
2. - - - - - EQUIPMENT CABLES ENCLOSED INSIDE DASHED LINE  
ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE  
THE DASHED LINE IS NON-1E, ION.
3. DELETED
4. DELETED
5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES  
ARE USED FOR ALARM ONLY.
6. NUMBERS SHOWN ON LINES BETWEEN MCC AND THE LOAD IT IS  
SUPPLYING ARE CABLE NUMBERS (eg A0100803). CABLE NUMBERS  
HAVING Z SUFFIX (eg E0100817Z) ARE CABLE NUMBERS FOR RUNS  
FROM THE ELECTRICAL PENETRATION TO THE LOAD INSIDE THE  
REACTOR CONTAINMENT.
7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER  
CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
8. - - - - - CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE)  
ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
9. FIELD POWER CABLE SHALL BE ROUTED IN CONDUIT. CONSTRUCTION  
TO WRAP CABLE PER 2323-ES-100 SPECIFICATION, APPENDIX F  
SKETCHES 16345-E-129 OR 16345-E-130, OR INSTALL A FLEX  
PER 2323-ES-100 APPENDIX F SKETCH 16345-E-119.
10. FOR BREAKER O/LH SETTINGS SEE REFERENCE DRAWING 2.
11. 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN  
REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
12. THIS TRANSFER SWITCH IS AN "OFF-LOAD TYPE" AND IS  
NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO  
PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND  
PREREQUISITES FOR TRANSFER OF POWER ARE STATED IN DBD  
EE-041 "480V AND 120V AC ELECTRICAL POWER SYSTEM."
13. DELETED
14. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS  
PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS  
UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD  
CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER  
BY SAFETY INJECTION SIGNAL INDICATED BY OR NEXT TO THE  
BREAKER/STARTER AS FOLLOWS:  
(A) - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)  
(B) - TRIPPED BY SAFETY INJECTION SEQUENCER AUTO LOCKOUT  
CONTACT (SIS/AL)

**REFERENCE DRAWINGS**

1. E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
2. E1-2400 PROTECTIVE DEVICE SETTINGS
3. E1-0009-C CONTROL POWER XFMR FUSE AND CONTROL  
CIRCUIT LOADING DATA
4. E1-0066-76 LOAD SHEDDING SCHEMATIC DIAGRAM
5. E1-0066-82 LOAD SHEDDING SCHEMATIC DIAGRAM
6. E1-0067-38 AUX RELAYS SCHEMATIC DIAGRAM
7. 2121B7150 SH 7C

DRAWING	E1-0009-A	REV	CP-11
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0009-A			
E1-0009-B			
E1-0009-C			

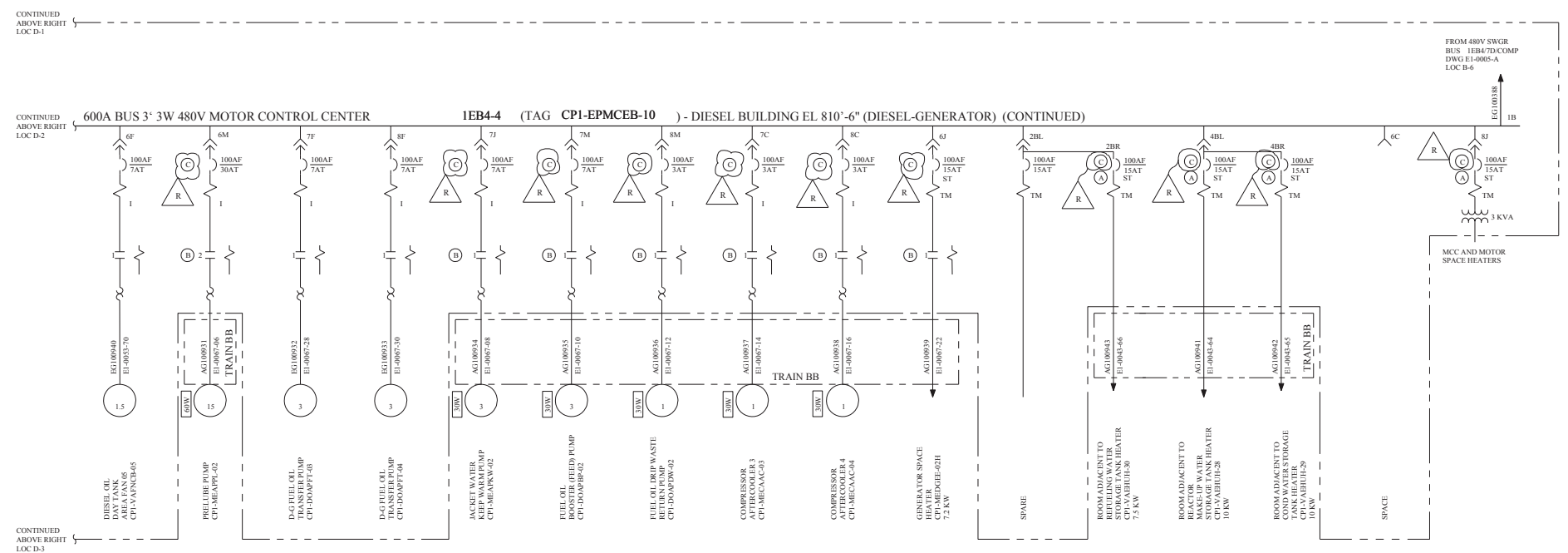
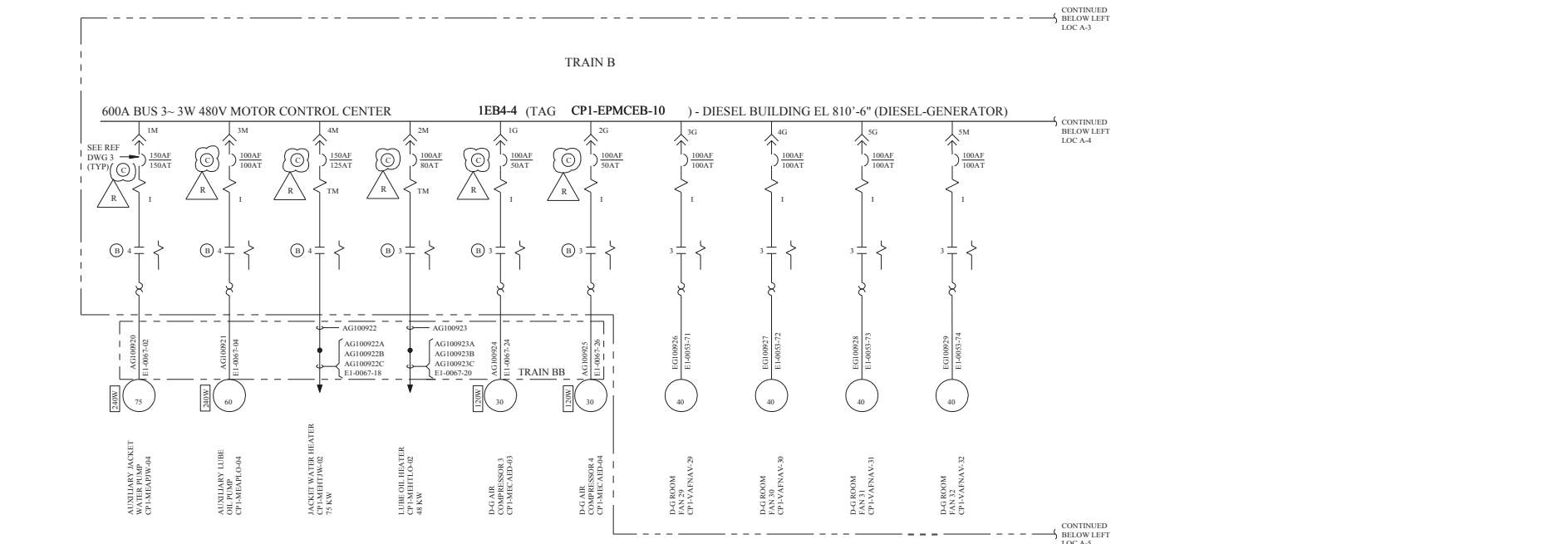
**CLASS I**

(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEBMC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

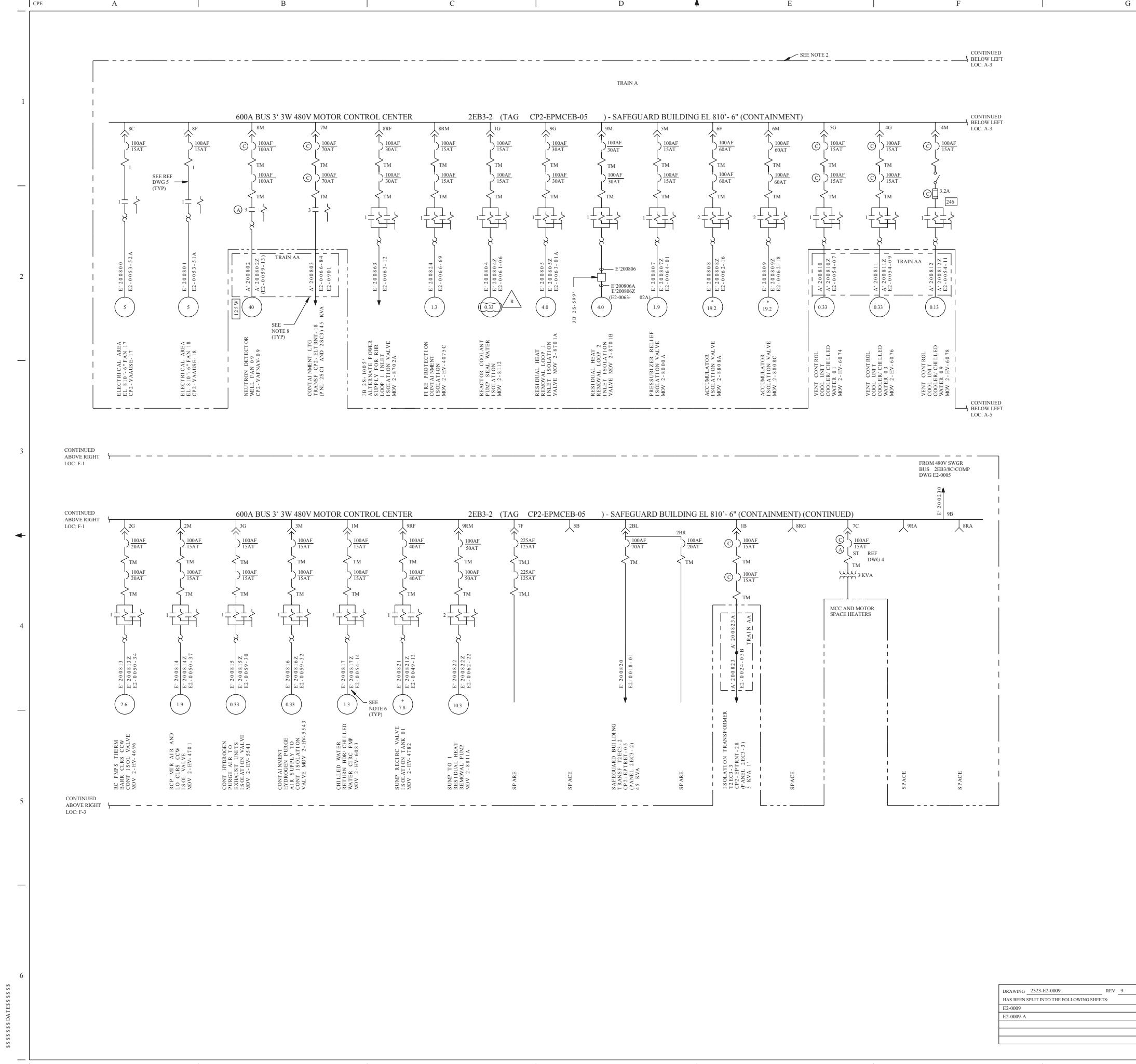
**CONTAINMENT AND DIESEL GENERATOR  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM**

DWG NO.	E1-0009	SH NO.	B	REV.	CP-8
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THIS DRAWING CREATED ELECTRONICALLY





REV	DWN	CHK	APPV	REMARKS
CP-17	188	188	2011	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA.2010.000172.76-00 PER SR.0001-10.000172.76-00

**FSAR FIGURE 8.3-10**

**LEGEND**

- 2M - MCC COMPARTMENT NUMBER
- DRAWOUT BREAKER DISCONNECT
- 30 AMP FUSED SWITCH
- 3.2A - 3.2 AMP FUSE RATING
- 246 - FUSE BOM ITEM NUMBER REF DWG 6
- 300 AF - 300 AMP CIRCUIT BREAKER
- AF - BREAKER FRAME SIZE
- AT - BREAKER TRIP RATING
- ST - BREAKER WITH SHUNT TRIP DEVICE
- MAGNETIC TRIP ELEMENT ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 9
- TM - THERMAL MAGNETIC TRIP ELEMENT
- MOTOR STARTER COIL AND CONTACT (NON-REVERSING) NEMA SIZE 2 STARTER
- THERMAL OVERLOAD RELAY
- MOTOR STARTER COILS AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
- 2 - INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 480-240/120V 1 PHASE (FOR SPACE HEATER)
- X - MOTOR SPACE HEATER WITH X WATT RATING
- INDICATES SPLICE PER 2323-ES-100
- \* - ALL MOTORS ARE RATED 460V EXCEPT FOR MOTORS MARKED WITH \* SIGN WHICH HAVE RATED VOLTAGE OF 480V.
- (A) - SEE NOTE 10
- (C) - SEE NOTE 10 AND 11

**NOTES**

1. ALL MOTOR AND FEEDER RATINGS GIVEN IN HP UNLESS OTHERWISE NOTED.
2. --- EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
3. DELETED
4. DELETED
5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
6. NUMBERS SHOWN ON LINES BETWEEN MCC AND THE LOAD IT IS SUPPLYING ARE CABLE NUMBERS (i.e. A.200803). CABLE NUMBERS HAVING Z SUFFIX (i.e. E.200817Z) ARE CABLE NUMBERS FOR RUNS FROM THE ELECTRICAL PENETRATION TO THE LOAD INSIDE THE REACTOR CONTAINMENT.
7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
8. --- CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
9. FOR BREAKER/OLH SETTING SEE REF DWG 3.
10. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY TO THE BREAKER/STARTER AS FOLLOWS:
  - (A) - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)
11. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS' UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER/FUSE.

**REFERENCE DRAWINGS**

1. E1-0001 PLANT ONE LINE DIAGRAM-UNITS 1 AND 2
2. E2-0005 480V AUXILIARIES ONE LINE DIAGRAM-SAFEGUARD BUSES
3. E2-2400 PROTECTIVE DEVICE SETTING
4. E2-0066-74 LOAD SHEDDING SCHEMATIC DIAGRAM
5. E2-0009-C CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA
6. E2-0024-04 FUSE BILL OF MATERIAL

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY 1  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

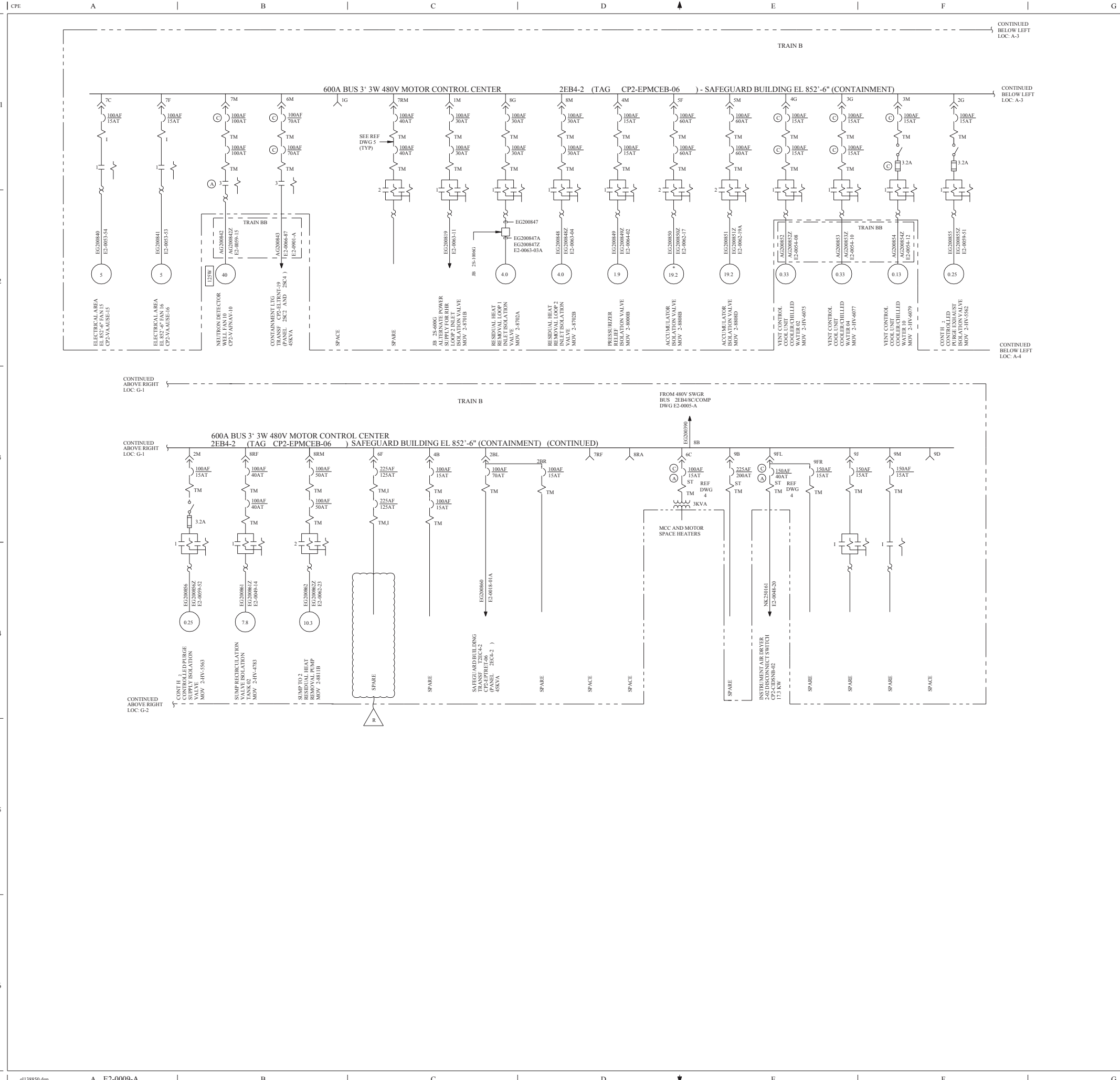
**CONTAINMENT AND DIESEL GENERATOR**  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DRAWING NO. E2-0009	REV 9
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0009	
E2-0009-A	

DWG NO. E2-0009      SH NO. -      REV. CP-17

\$\$\$\$\$DATE\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY



REV	DATE	BY	CHKD	APPD	REMARKS
17-17	01-22-2004	WJ	WJ	WJ	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-002061-01-00 PER SK-0013-04-002061-01-00

**FSAR FIGURE 8.3-10**

- LEGEND**
- 2M - MCC COMPARTMENT NUMBER
  - AF - DRAWOUT BREAKER DISCONNECT
  - 3.2A - 3' 30 AMP FUSED SWITCH WITH 3.2 AMP FUSE TRIP RATING
  - AE - 3' CIRCUIT BREAKER
  - AT - BREAKER FRAME SIZE
  - AT - BREAKER TRIP RATING
  - ST - BREAKER WITH SHUNT TRIP DEVICE
  - 1 - MAGNETIC TRIP ELEMENT ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 9
  - TM - THERMAL MAGNETIC TRIP ELEMENT
  - 2 - MOTOR STARTER COIL AND CONTACT (NON-REVERSING) NEMA SIZE 2 STARTER
  - 2 - THERMAL OVERLOAD RELAY
  - 2 - MOTOR STARTER COIL AND CONTACT (REVERSING) NEMA SIZE 1 STARTER
  - 2 - INDICATES DISTRIBUTION TRANSFORMER, 480-240/120V 1 PHASE (FOR SPACE HEATERS)
  - - FEEDER TO LOCAL PANEL, STARTER OR CONTACTOR AT EQUIPMENT
  - X - MOTOR SPACE HEATER WITH X WATT RATING
  - \* - ALL MOTORS ARE RATED 460V EXCEPT FOR MOTORS MARKED WITH \* SIGN WHICH HAVE RATED VOLTAGE OF 480V.
  - A - SEE NOTE 10
  - C - SEE NOTE 10 AND 11

- NOTES**
1. ALL MOTOR AND FEEDER LOADS GIVEN IN HP UNLESS OTHERWISE NOTED.
  2. EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
  3. DELETED
  4. DELETED
  5. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  6. NUMBERS SHOWN ON LINES BETWEEN MCC AND THE LOAD IT IS SUPPLYING ARE CABLE NUMBERS (i.e. A'200803). CABLE NUMBERS HAVING Z SUFFIX (i.e. E'200817Z) ARE CABLE NUMBERS FOR RUNS FROM THE ELECTRICAL PENETRATION TO THE LOAD INSIDE THE REACTOR CONTAINMENT.
  7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
  8. CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
  9. FOR BREAKER/OLH SETTING SEE REF DRAWING 3.
  10. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY NEXT TO THE BREAKER/STARTER AS FOLLOWS:  
 (A) TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)  
 (C) TRIPPED BY SAFETY INJECTION SIGNAL (SIAS)
  11. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER/FUSE.

- REFERENCE DRAWING**
1. E1-0001 PLANT ONE LINE DIAGRAMS- UNITS 1 AND 2
  2. E2-0005A 480V AUXILIARIES ONE LINE DIAGRAM-SAFEGUARD BUSES
  3. E2-2400 PROTECTIVE DEVICE SETTING
  4. E2-0066-76 LOAD SHEDDING SCHEMATIC DIAGRAM
  5. E2-0009-D CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA

DRAWING E2-0009-A	REV CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0009-A	
E2-0009-B	
DRAWING 2323-E2-0009	
REV 9	
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0009	
E2-0009-A	

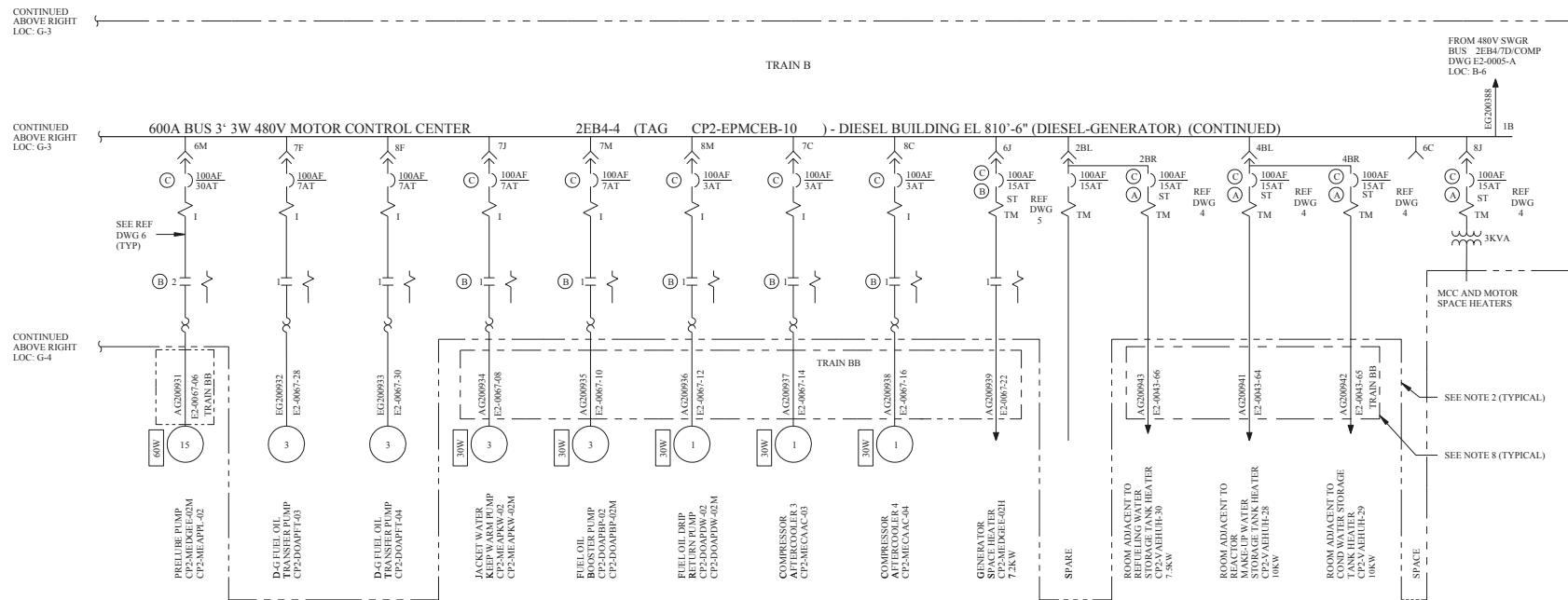
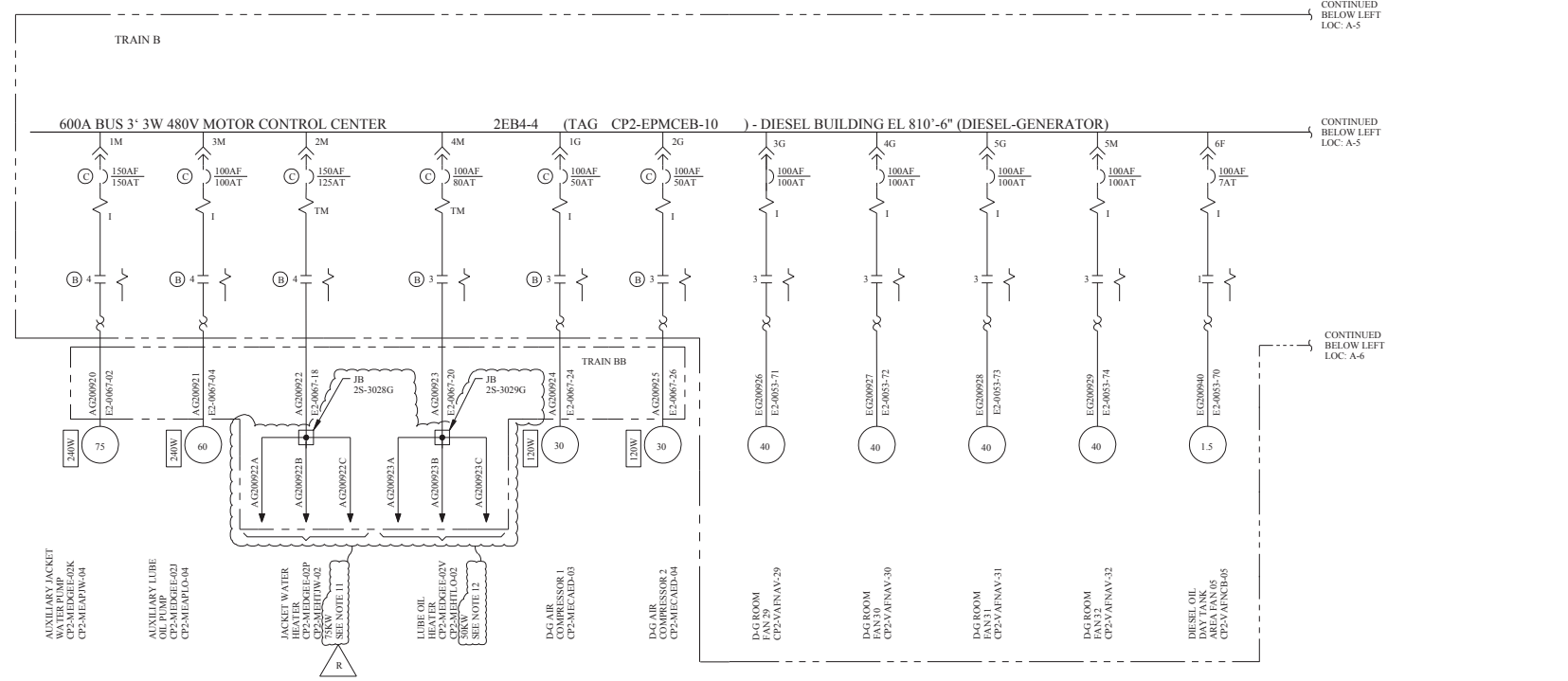
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SYSTEM CATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

**CONTAINMENT & DIESEL GENERATOR**  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DWG. NO. E2-0009	SH. NO. A	REV. CP-17
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**FINAL PRINT**



REV	BY	CHK	APPV	DATE	REMARKS
CP-13	SM	10-12	2001	2001	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2001-002153-01-00 PER 98-0002-01-002153-01-00

**FSAR FIGURE 8.3-10**

**LEGEND**

- 2M - MCC COMPARTMENT NUMBER
- DRAWOUT BREAKER DISCONNECT
- 3' - CIRCUIT BREAKER
- AF - BREAKER FRAME SIZE
- AT - BREAKER TRIP RATING
- ST - BREAKER WITH SHUNT TRIP DEVICE
- MAGNETIC TRIP ELEMENT ADJUSTABLE
- INSTANTANEOUS MAGNETIC TRIP SEE NOTE 9
- THERMAL MAGNETIC TRIP ELEMENT
- MOTOR STARTER COIL AND CONTACT (NON-REVERSING)
- NEMA SIZE 2 STARTER
- THERMAL OVERLOAD RELAY
- INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER, 480-240/120V 1 PHASE (FOR SPACE HEATERS)
- MOTOR SPACE HEATER WITH X WATT RATING
- SEE NOTE 10
- SEE NOTE 10
- SEE NOTE 10
- JUNCTION BOX

- NOTES**
- ALL MOTOR AND FEEDER LOADS GIVEN IN HP UNLESS OTHERWISE NOTED.
  - EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
  - DELETED
  - DELETED
  - THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  - NUMBERS SHOWN ON LINES BETWEEN MCC AND THE LOAD IT IS SUPPLYING ARE CABLE NUMBERS (i.e. E 200803). CABLE NUMBERS HAVING Z SUFFIX (i.e. E 200817Z) ARE CABLE NUMBERS FOR RUNS FROM THE ELECTRICAL PENETRATION TO THE LOAD INSIDE THE REACTOR CONTAINMENT.
  - INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
  - CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
  - FOR BREAKER O/LH SETTING SEE REF DRAWING 3.
  - ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY (A) NEXT TO THE BREAKER/STARTER AS FOLLOWS:  
 (A) - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIS/AS)  
 (B) - TRIPPED BY SAFETY INJECTION SEQUENCER AUTO LOCKOUT CONTACT (SIS/AL)
  - THIS IS A 3-3' HEATER. FOR CONNECTION DETAILS SEE REF DRAWING 7.
  - THIS IS A 3-3' HEATER. FOR CONNECTION DETAILS SEE REF DRAWING 8.

**REFERENCE DRAWING**

1. E1-0001	PLANT ONE LINE DIAGRAMS- UNITS 1 AND 2
2. E2-0005A	480V AUXILIARIES ONE LINE DIAGRAM-SAFEGUARD BUSES
3. E2-2400	PROTECTIVE DEVICE SETTING
4. E2-0066-82	LOAD SHEDDING SCHEMATIC DIAGRAM
5. E2-0067-38	LOAD SHEDDING SCHEMATIC DIAGRAM
6. E2-0009-D	CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA
7. E2-0067-18	JACKET WATER HEATER TAG CP2-MEHTJW-02
8. E2-0067-20	LUBE OIL HEATER TAG CP2-MEHTLO-02

DRAWING E2-0009-B	REV CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0009-B	
E2-0009-C	
DRAWING E2-0009-B	REV CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0009-B	
E2-0009-D	
DRAWING E2-0009-A	REV CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0009-A	
E2-0009-B	

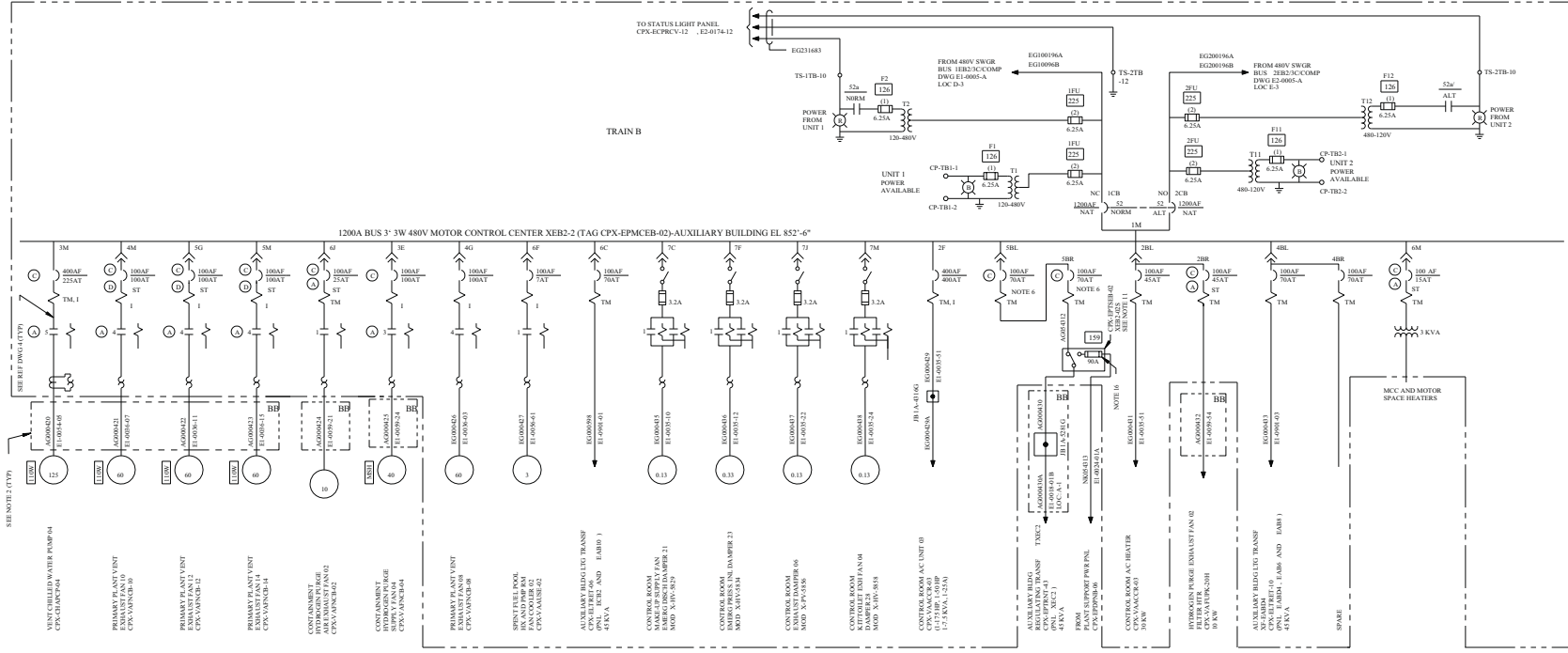
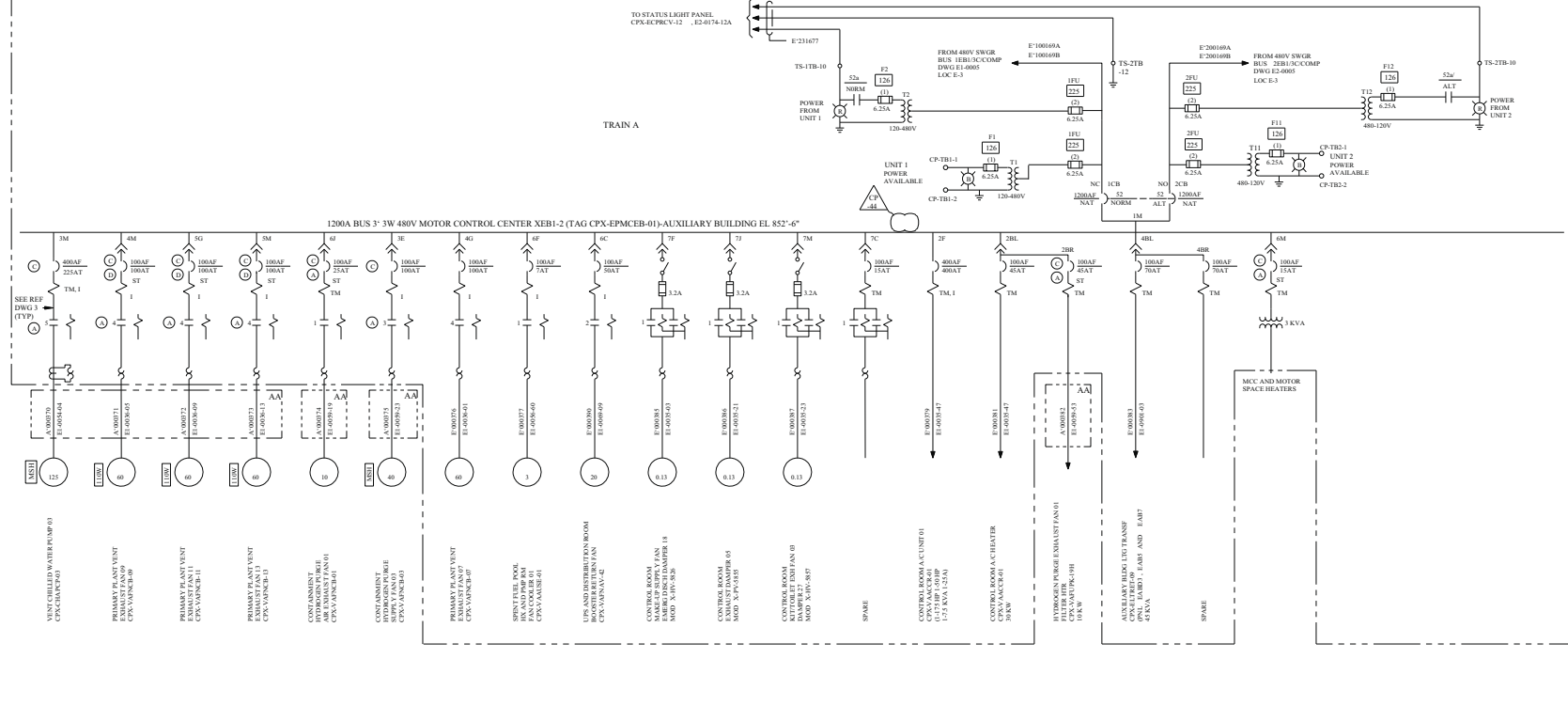
**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1      SEISMIC CATEGORY 1  
SAFETY CLASS 2      CLASS 1  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

**CONTAINMENT & DIESEL GENERATOR**  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM





REV	DATE	BY	CHKD	APPV	REMARKS
744	11/11/11				SEE DRAWING REVISIONS TO INCORPORATE AN EDITORIAL CHANGE PER ACR 2011-013751

**FSAR FIGURE 8.3-11**

**LEGEND**

- 40 - MCC COMPARTMENT NUMBER
- DR - DRAWOUT BREAKER DISCONNECT
- AT - AUTOMATIC TRANSFER UNIT WITH TWO, 3-CIRCUIT BREAKERS
- AT - BREAKER FRAME SIZE
- NAT - NON AUTOMATIC TRIP
- 3 - 3-CIRCUIT BREAKER
- AT - BREAKER FRAME SIZE
- AT - BREAKER TRIP RATING
- 2 - MOTOR STARTER COIL AND CONTACT (NON-REVERSING) NEMA SIZE 2 STARTER
- 1 - MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
- TM - THERMAL MAGNETIC TRIP ELEMENT
- MAGNETIC TRIP ELEMENT
- ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 10
- THERMAL OVERLOAD RELAY
- CURRENT TRANSFORMER
- MOTOR SPACE HEATER WITH "X" WATT RATING
- INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 400V-240/120V 1 PHASE (FOR SPACE HEATER)
- 3 - 30 AMP FUSED SWITCH WITH GOLD-SHAFTMUT TYPE TRS TR4-CONC FUSES 32 AMP FUSE TRIP RATING
- INDICATES SPICE PER 2323-45-100 UNLESS OTHERWISE NOTED
- INDICATES TERMINAL IN 480V MCC
- MOTOR SPACE HEATER
- 1CB - AUTOMATIC TRANSFER UNIT CIRCUIT BREAKER 1
- ST - CIRCUIT BREAKER WITH SHUNT TRIP DEVICE
- INDICATING LIGHT B-(BLUE), R-(RED)
- FUSE
- FUSE B/M ITEM NUMBER (REF DWG 5)
- (2) - FUSE QUANTITY
- 6.25A FUSE RATING
- SEE NOTE 13
- SEE NOTE 13 AND 14
- SEE NOTE 15

**NOTES**

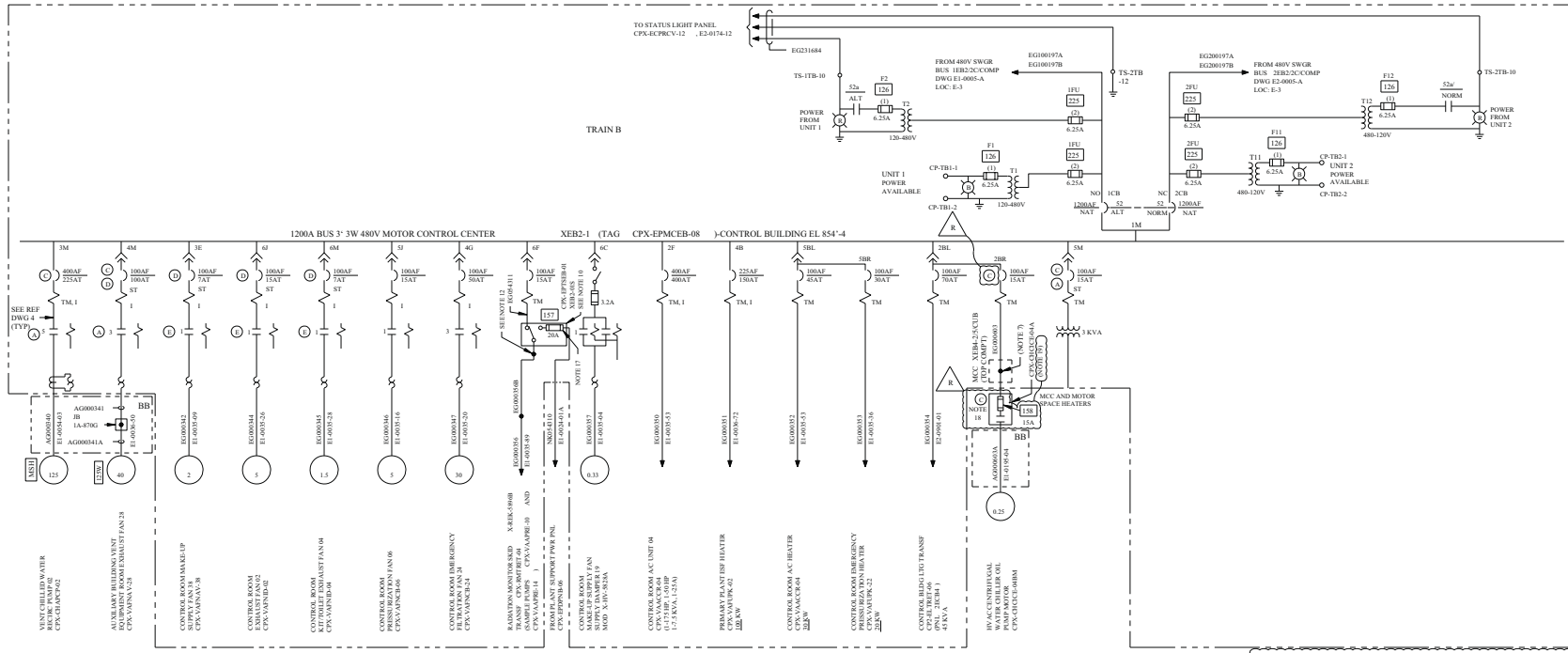
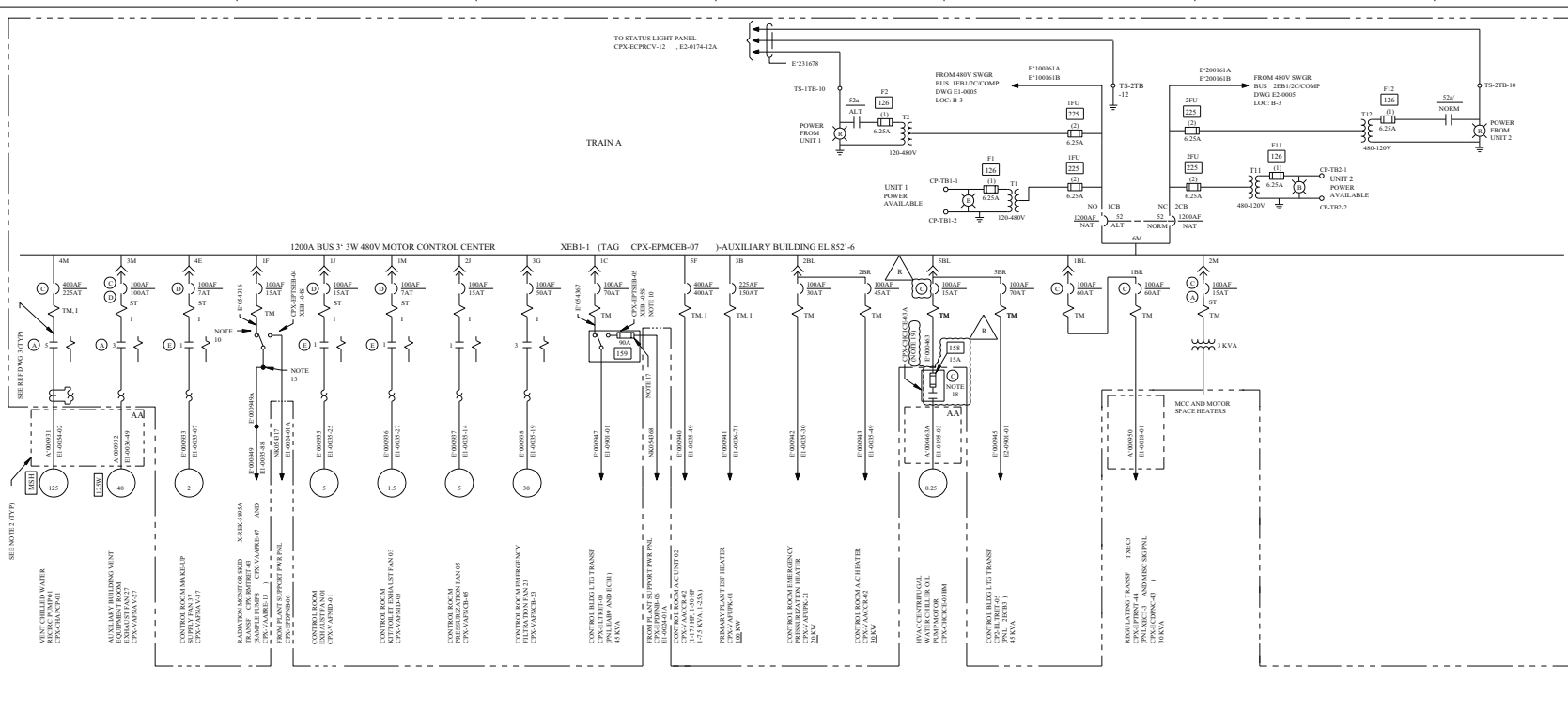
- EQUIPMENT CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-CLASS 1E.
- CABLES ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
- DELETED
- DELETED
- INTERTRIP RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25000 RMS SYMMETRICAL AMPERES.
- TO INSURE PROTECTION OF CABLES SEATED FOR TRIP, DO NOT INCREASE THE TRIP SETTING OF THIS PROTECTIVE DEVICE.
- DELETED
- DELETED
- DELETED
- FOR BREAKER/COIL SETTINGS SEE REFERENCE DRAWING 2.
- THIS TRANSFER SWITCH IS A "HOT" LOAD TYPE AND IS NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND PRIORITIES FOR TRANSFER OF POWER ARE STATED IN ORD E-040 "400V AND 120V AC ELECTRICAL POWER SYSTEM".
- 100A BREAKER TO BE REPLACED WITH 100A BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY NEXT TO THE BREAKER/STARTER AS FOLLOWS:
  - TRIP BY SAFETY INJECTION ACTUATION SIGNAL (SIS) FROM EITHER UNIT
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER/FUSE.
- TO ASSURE SINGLE ACTIVE FAILURE PROOF TRIP OF THE FAN THE BREAKER IS TRIPPED OR CONTACTOR OPENED BY ACCIDENT SIGNAL INDICATED NEXT TO THE DEVICE AS FOLLOWS:
  - TRIP BY SAFETY INJECTION ACTUATION SIGNAL (SIS) FROM EITHER UNIT
  - OPPOSITE TRAIN HAS (SAFETY INJECTION ACTUATION SIGNAL) FROM EITHER UNIT
- FUSES ARE NON-CLASS 1E.

**CLASS 1E**  
(NUCLEAR SAFETY RELATED)  
CLASS 1E CATEGORY 1  
SAFETY CLASS 1  
SAFETY LEVEL 1  
SAFETY SYSTEM CIRCLES

**LUMINANT**  
CPNP  
GLEN ROSE, TEXAS

**COMMON AUXILIARY AND CONTROL BLDGS**  
SAFEGUARD 480 V MCCS  
ONE LINE DIAGRAM

DWG NO: E1-0010      SHEET NO: 10      REV: CP-44



REV	DATE	BY	CHKD	APPV	REMARKS
7-30	08/11/00	001	001	001	ISSUE DRAWING FOR TRAIN B MOTOR CONTROL CENTER CHANGE FILE: 2002-00074-00-FOR FILE: 00-0001-05-000475-01-00

**FSAR FIGURE 8.3-11**

**CLASS I**  
(NUCLEAR SAFETY RELATED)

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

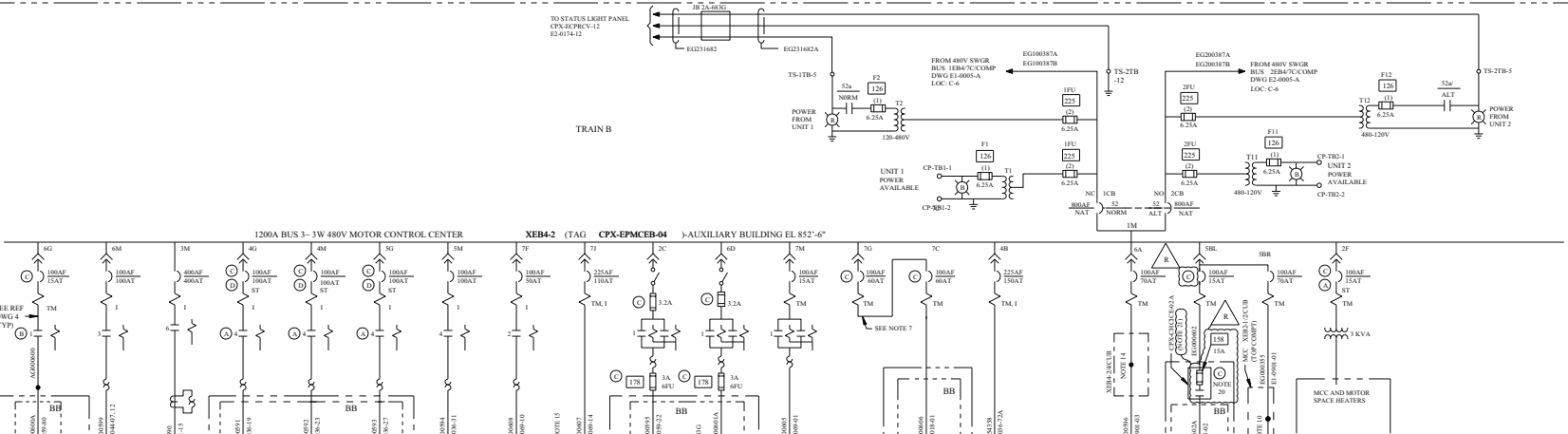
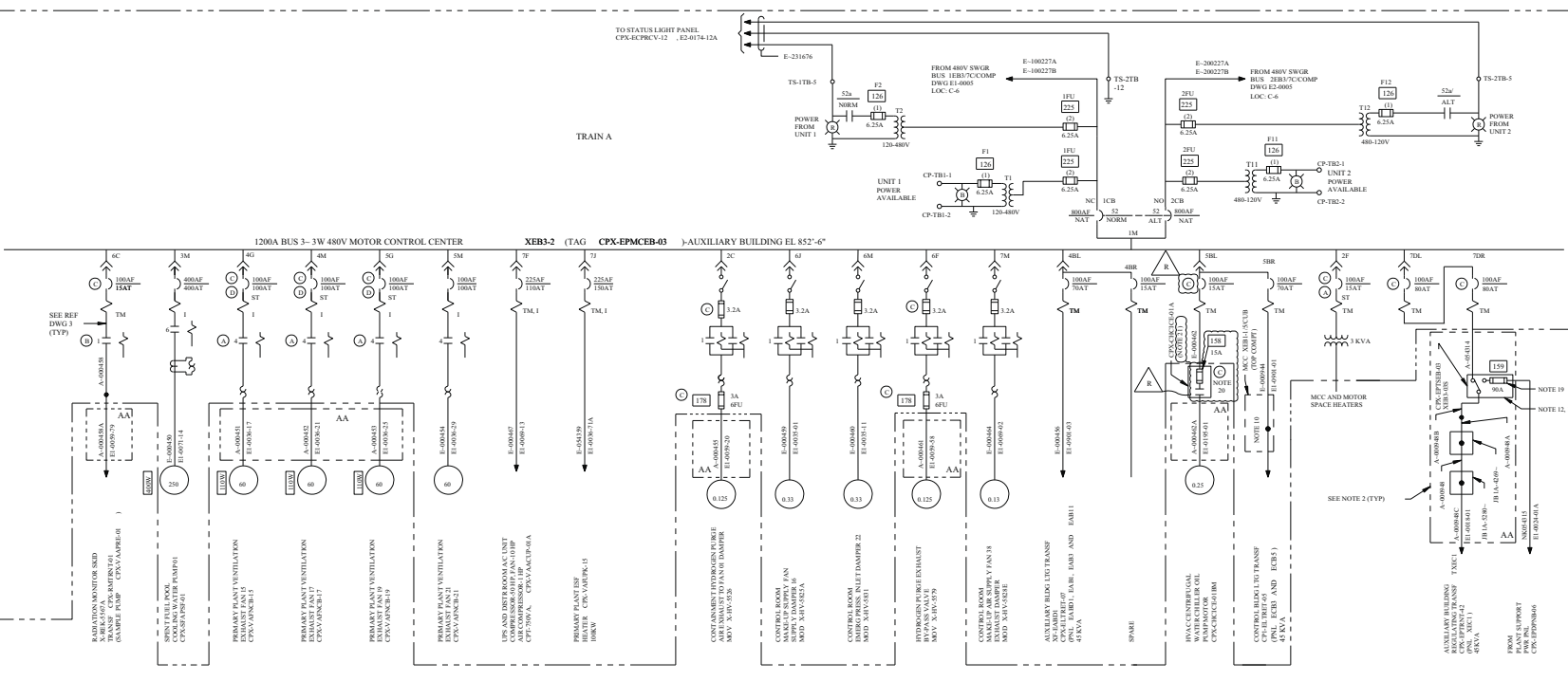
**COMMON AUXILIARY AND CONTROL BLDGS**  
SAFEGUARD 480 V MCCS  
ONE LINE DIAGRAM

DWG NO: E1-0010 | SHEET NO: A | REV: CP-39

DRAWING	2323-E1-0010	REV	CP-7
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
1.	E1-0010		
2.	E1-0010-B		
3.	E1-0010-C		
4.	E1-0010-D		
5.	E1-0024-04		
6.	E1-0066-79		
7.	E1-0066-80		

- REFERENCES**
- E1-0010
  - E1-0010-B
  - E1-0010-C
  - E1-0010-D
  - E1-0024-04
  - E1-0066-79
  - E1-0066-80
- PLANT ONE LINE DIAGRAMS UNITS 1 AND 2**  
PROTECTIVE REVERSE FEEDING  
TRAIN A CONTROL POWER XMB FUSE AND CONTROL CIRCUIT LOADING DATA  
TRAIN B CONTROL POWER XMB FUSE AND CONTROL CIRCUIT LOADING DATA  
FUSE BILL OF MATERIALS  
LOAD SHEDDING SCHEMATIC DIAGRAM  
LOAD SHEDDING SCHEMATIC DIAGRAM

- NOTES (CONT)**
- THE 15A TYPE KTC-R FUSES IN THE STARTER ARE COORDINATED WITH THE MCC CIRCUIT BREAKER. THE FUSES ARE QUALIFIED FOR SAFETY RELATED CLASS I USE AND ARE ACCEPTABLE TO BE USED AS AN ISOLATION DEVICE.
  - STARTER IS SHIMMERSALLY MOUNTED.



- REFERENCES
- E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
  - E1-2400 PROTECTIVE DEVICE SETTINGS
  - E1-0010-C TRAIN A CONTROL POWER NEMA FUSE AND CONTROL CIRCUIT LOAD DATA
  - E1-0010-D TRAIN B CONTROL POWER NEMA FUSE AND CONTROL CIRCUIT DATA
  - E1-0024-04 DEVICE LEVEL ONE LINE DIAGRAM FUSE BREAKER WILL OF MATERIAL
  - E1-0066-78 LOAD SHEDDING SCHEMATIC DIAGRAM
  - E1-0066-80 LOAD SHEDDING SCHEMATIC DIAGRAM

- NOTES (CONT)
- SPICE USING BOLTED IN-LINE CONNECTORS AND INSULATE WITH RAYCHEM PER 2323-ES-100. EXTENSION WIRE SHALL BE OF SAME SIZE AS CABLE 6000996.
  - CABLE REDUCTION PER 2323-ES-100.
  - ISOLATION BETWEEN CLASS IIE BUS AND NON-CLASS IIE LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY **NO** TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY **NI** TO THE BREAKER/STARTER AS FOLLOWS:
    - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS) FROM EITHER UNIT
    - TRIPPED BY SAFETY INJECTION SEQUENCER AUTO LOCKOUT (SIAL) FROM EITHER UNIT

- ISOLATION BETWEEN CLASS IIE BUS AND NON-CLASS IIE LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES. EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY **NO** TO THE BREAKER/FUSE.
- TO ASSURE SINGLE ACTIVE FAILURE PROOF TRIP OF THE FAN THE BREAKER IS TRIPPED OR CONTACTOR OPENS BY ACCIDENT SIGNAL INDICATED NEXT TO THE DEVICE AS FOLLOWS:
  - OPPOSITE TRAIN SIAS (SAFETY INJECTION ACTUATION SIGNAL)
- SWITCH IN CLASS IIE FUSES ARE NON-CLASS IIE
- THE 15A TYPE KTK-R FUSES IN THE STARTER ARE COORDINATED WITH THE MCC CIRCUIT BREAKER. THE FUSES ARE QUALIFIED FOR SAFETY RELATED CLASS IIE USE AND ARE ACCEPTABLE TO BE USED AS AN ISOLATION DEVICE

- STARTER IS MECHANICALLY MOUNTED

REV	DATE	BY	CHKD	APPV	REMARKS
7-0					ISSUE DRAWING REVISED TO REFLECT DESIGN CHANGE PER 2005-00074-00-00 PER ISL 0002-02-000475-00-00

**FSAR FIGURE 8.3-11**

**LEGEND**

- MCC COMPARTMENT NUMBER
- DRAWOUT BREAKER DISCONNECT
- AUTOMATIC TRANSFER UNIT WITH TWO 3-CIRCUIT BREAKERS
- AF - BREAKER FRAME SIZE
- NAT - NON-AUTOMATIC TRIP
- 3-CIRCUIT BREAKER (UNLESS OTHERWISE NOTED)
- AF - BREAKER FRAME SIZE
- AT - BREAKER TRIP RATING
- MOTOR STARTER COIL AND CONTACT (NON-REVERSING) NEMA SIZE 1 STARTER
- MOTOR STARTER COIL AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
- TM - THERMAL MAGNETIC TRIP ELEMENT
- MAGNETIC TRIP ELEMENT
- ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 11
- THERMAL OVERLOAD RELAY
- CURRENT TRANSFORMER
- MOTOR SPACE HEATER WITH "X" WATT RATING
- INDICATES MOTOR 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 480V-240V 1 PHASE (FOR SPACE HEATER)
- 3-30 AMP FUSED SWITCH WITH COIL-STARTER TYPE TRIP TRC-000 FUSES 3.2 AMP FUSE TRIP RATING
- INDICATING LIGHT B-400V, R-RED
- INDICATES TERMINAL IN 480V MCC
- ICB - AUTOMATIC TRANSFER UNIT CIRCUIT BREAKER 1
- ST - CIRCUIT BREAKER WITH SHUNT TRIP DEVICE
- INDICATES SPICE PER 2323-ES-100 UNLESS OTHERWISE NOTED

**FUSE**

151 FUSE BM ITEM NUMBER (REF DWG 5)

(2) FUSE QUANTITY

6.25A FUSE RATING

SEE NOTE 16

SEE NOTE 16

SEE NOTE 16 AND 17

SEE NOTE 18

**NOTES**

- EQUIPMENT CABLES ENCLOSED INSIDE DASHED LINE
- ARE CLASS IIE, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-IIE, UON
- CABLES ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS IIE, TRAIN AA OR TRAIN BB AS NOTED
- DELETED
- DELETED
- INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25,000 RMS SYMMETRICAL AMPERES.
- DELETED
- SIZE AND TYPE OF JUMPER BETWEEN BREAKER COMPT "G" AND "C" SHALL BE SAME AS LOAD SIDE
- DELETED
- SPICE CABLES E-00944 AND E000151 USING COMPRESSION SPICE SLEEVES AND INSULATE WITH RAYCHEM TUBING PER 2323-ES-100
- FOR BREAKER/OLH SETTINGS SEE REFERENCE DRAWING 2.
- THIS TRANSFER SWITCH IS AN "OFF-LOAD" TYPE AND IS NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND PREREQUISITES FOR TRANSFER OF POWER ARE STATED IN DIBD IE-644 "480V AND 240V AC ELECTRICAL POWER SYSTEM"
- 100AF BREAKER TO BE REPLACED WITH 100AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.

DRAWING: E1-0010-B	REV: CP-19
E1-0010-B	
E1-0010-C	
E1-0010-D	

DRAWING: 2323-E1-0010	REV: CP-7
E1-0010	
E1-0010-A	
E1-0010-B	

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFE FOR USE IN CLASS I AREAS  
SAFETY CLASS: CLASS IIE  
SAFETY TYPE: SAFETY CIRCUITS

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

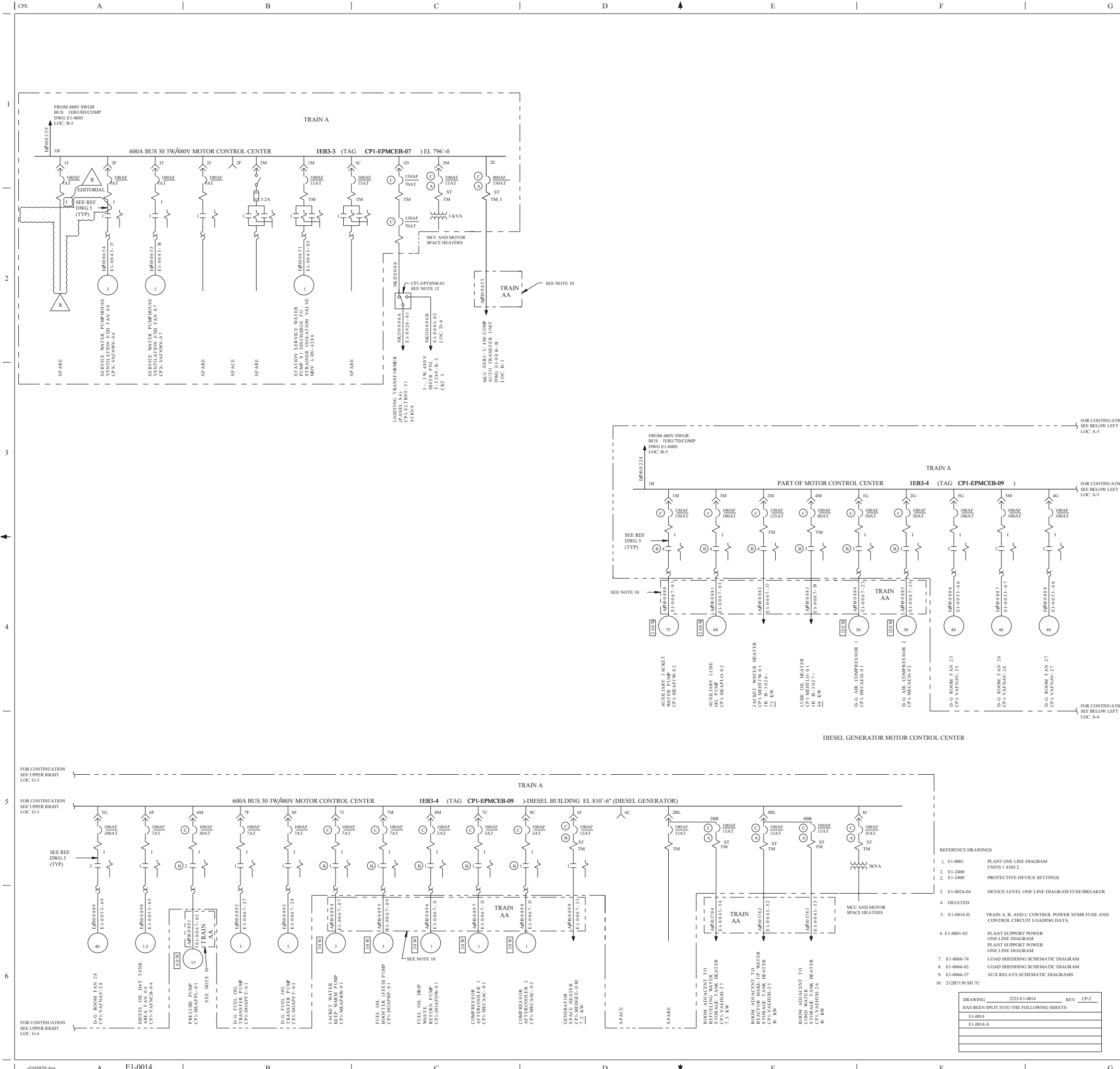
**COMMON AUXILIARY AND CONTROL BLDGS**  
SAFEGUARD 480V MCCS  
ONE LINE DIAGRAM

DWG NO: E1-0010 | SHEET NO: B | REV: CP-42

FINAL PRINT

REF: CD 07-27-151596

THIS DRAWING IS CONTROLLED ELECTRONICALLY



REV	CHK	APPV	REMARKS
29-31			THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FMA-2013-000128-01-00 PER SK-0001-13-000129-01-00 EDITORIAL CHANGE AS NOTED

FSAR FIGURE 8.3-12

- LEGEND**
- 2M - MCC COMPARTMENT NUMBER
  - DRAWOUT BREAKER DISCONNECT
  - 30/AT - CIRCUIT BREAKER
  - AF - BREAKER FRAME SIZE
  - AT - BREAKER TRIP RATING
  - ST - INDICATES BREAKER WITH SHUNT TRIP DEVICE
  - 30/25 - 30/ FUSED DISCONNECT SWITCH
  - 25 - BOM ITEM NO REF DWG 3
  - THERMAL OVERLOAD RELAY
  - MAGNETIC TRIP ELEMENT
  - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 13
  - TM - THERMAL MAGNETIC ELEMENT
  - MOTOR STARTER COIL AND CONTACT (NON REVERSING)
  - NEMA SIZE 2 STARTER
  - MOTOR STARTER COILS AND CONTACTS (REVERSING)
  - NEMA SIZE 1 STARTER
  - 2 - INDICATES MOTOR, 2 HORSEPOWER
  - INDICATES DISTRIBUTION TRANSFORMER
  - 480-240/120V-1 PHASE (FOR SPACE HEATERS)
  - 6.25A - FUSE RATING
  - 151 - FUSE/BKR BOM ITEM NUMBER REF DWG 3
  - X - MOTOR SPACE HEATER WITH "X" WATT RATING
  - MSH - MOTOR SPACE HEATER
  - A - SEE NOTE 16
  - B - SEE NOTE 16
  - C - SEE NOTE 16 AND 17

- NOTES**
1. DELETED
  2. - EQUIPMENT CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
  3. DELETED
  4. DELETED
  5. DELETED
  6. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  7. DELETED
  8. DELETED
  9. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25000 RMS SYMMETRICAL AMPERES.
  10. - CABLE(S) ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
  11. FIELD POWER CABLE SHALL BE ROUTED IN CONDUIT. CONSTRUCTION TO WRAP CABLE PER 2323-ES-100 SPEC, APPENDIX F SKETCHES 16345-E-129 OR 16345-E-130 OR INSTALL FLEX PER 2323-ES-100 SPEC, APPENDIX F SKETCH 16345-E-119.
  12. THIS TRANSFER SWITCH IS AN "OFF-LOAD TYPE" AND IS NORMALLY ALIGNED TO THE MCC. IT CAN ONLY BE ALIGNED TO PLANT SUPPORT POWER DURING OUTAGES. REQUIREMENTS AND PRELIMINARIES FOR TRANSFER OF POWER ARE STATED IN DDD E-041 "480V AND 120V AC ELECTRICAL POWER SYSTEM".
  13. SEE REFERENCE DRAWING 2 FOR BREAKER/OLI SETTINGS.
  14. DELETED
  15. 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
  16. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY OR NEXT TO THE BREAKER/STARTER AS FOLLOWS:  
 - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)  
 - TRIPPED BY SAFETY INJECTION SEQUENCER AUTO LOCKOUT CONTACT (SEAL)
  17. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO BREAKERS, A BREAKER AND A FUSE OR TWO FUSES IN SERIES, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER/FUSE.

- REFERENCE DRAWINGS**
1. E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
  2. E1-2400 PROTECTIVE DEVICE SETTINGS
  3. E1-0024-04 DEVICE LEVEL ONE LINE DIAGRAM FUSE/BREAKER
  4. DELETED
  5. E1-0014-D TRAIN A, B, AND C CONTROL POWER XMR FUSE AND CONTROL CIRCUIT LOADING DATA
  6. E1-0001-02 PLANT SUPPORT POWER ONE LINE DIAGRAM
  7. E1-0066-74 PLANT SUPPORT POWER ONE LINE DIAGRAM
  8. E1-0066-82 LOAD SHEDDING SCHEMATIC DIAGRAM
  9. E1-0066-37 AUX RELAYS SCHEMATIC DIAGRAMS
  10. 212B7150 SH 7C

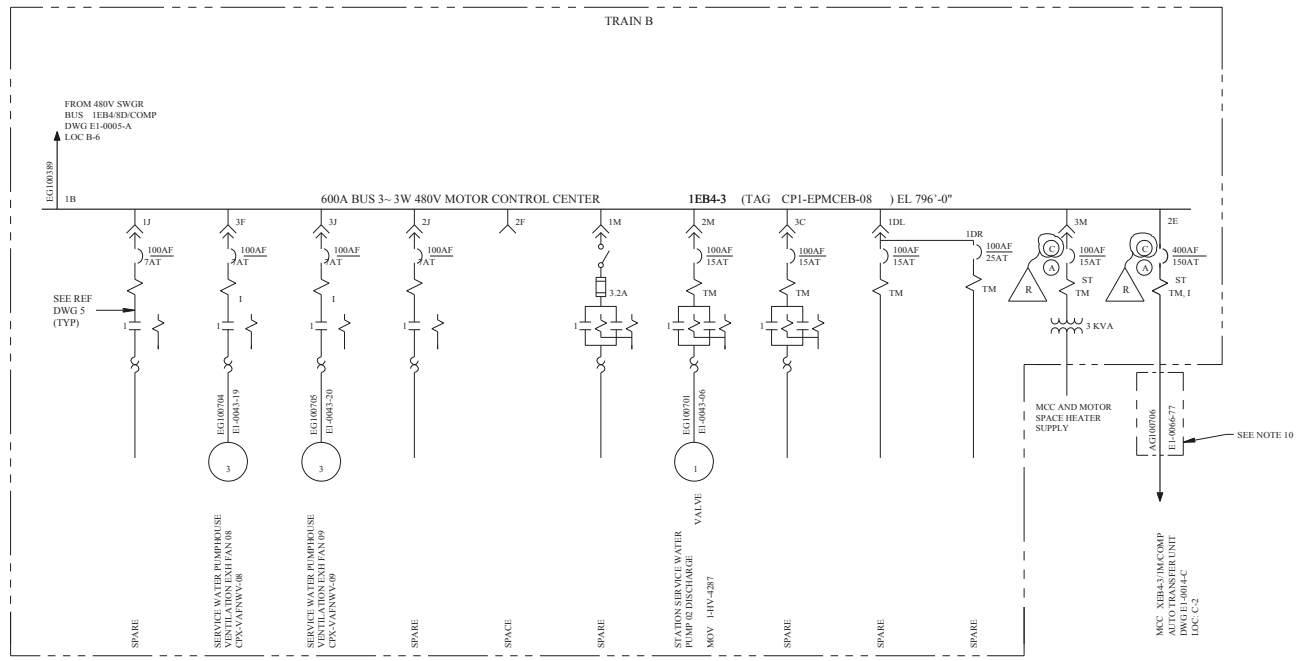
DRAWING	2323-E1-0014	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0014			
E1-0014-A			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 - SERVICING CATEGORY I  
SAFETY CLASS 2 - CLASS 1 ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

**SERVICE WATER INTAKE**  
STRUCTURE AND DIESEL GENERATOR  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DWG. NO.	SH. NO.	REV.
E1-0014	-	CP-31



REV	DWN	CHK	APP'D	REMARKS
CP-21	SM	DE		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2002-003779-01-00 PER 98-0025-02-003779-01-00

FSAR FIGURE 8.3-12

- NOTES:
- DELETED
  - EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
  - DELETED
  - DELETED
  - DELETED
  - THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  - MCC STARTER IS USED ONLY TO BLOCK PUMP START DURING BLACKOUT SEQUENCE.
  - DELETED
  - DELETED
  - INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25000 RMS SYMMETRICAL AMPERES
  - CABLES ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E, TRAIN AA OR TRAIN BB AS NOTED.
  - SEE REFERENCE DRAWING 2 FOR BREAKER/OLH SETTINGS
  - DELETED
  - 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED
  - ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS (UPSTREAM CIRCUIT BREAKER INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY NEXT TO THE BREAKER/STARTER AS FOLLOWS:
    - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)

REFERENCE DRAWINGS

1. E1-0001	PLANT ONE LINE DIAGRAM (UNITS 1 AND 2)
2. E1-2400	PROTECTIVE DEVICE SETTINGS
3. E1-0024-04	DEVICE LEVEL ONE LINE DIAGRAM FUSE/BREAKER BILL OF MATERIAL
4. DELETED	
5. E1-0014-D	TRAIN A, B, AND C CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA
6. 212B7150-2	MCC 1EB4-3 OUTLINE SUMMARY
7. 212B7150-5, 6	MCC XEB4-3 OUTLINE SUMMARY

DRAWING	2323-E1-0014	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0014			
E1-0014-A			

DRAWING	E1-0014-A	REV	CP-10
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0014-A			
E1-0014-B			
E1-0014-C			
E1-0014-D			

TRAIN B

CLASS I  
(NUCLEAR SAFETY-RELATED)

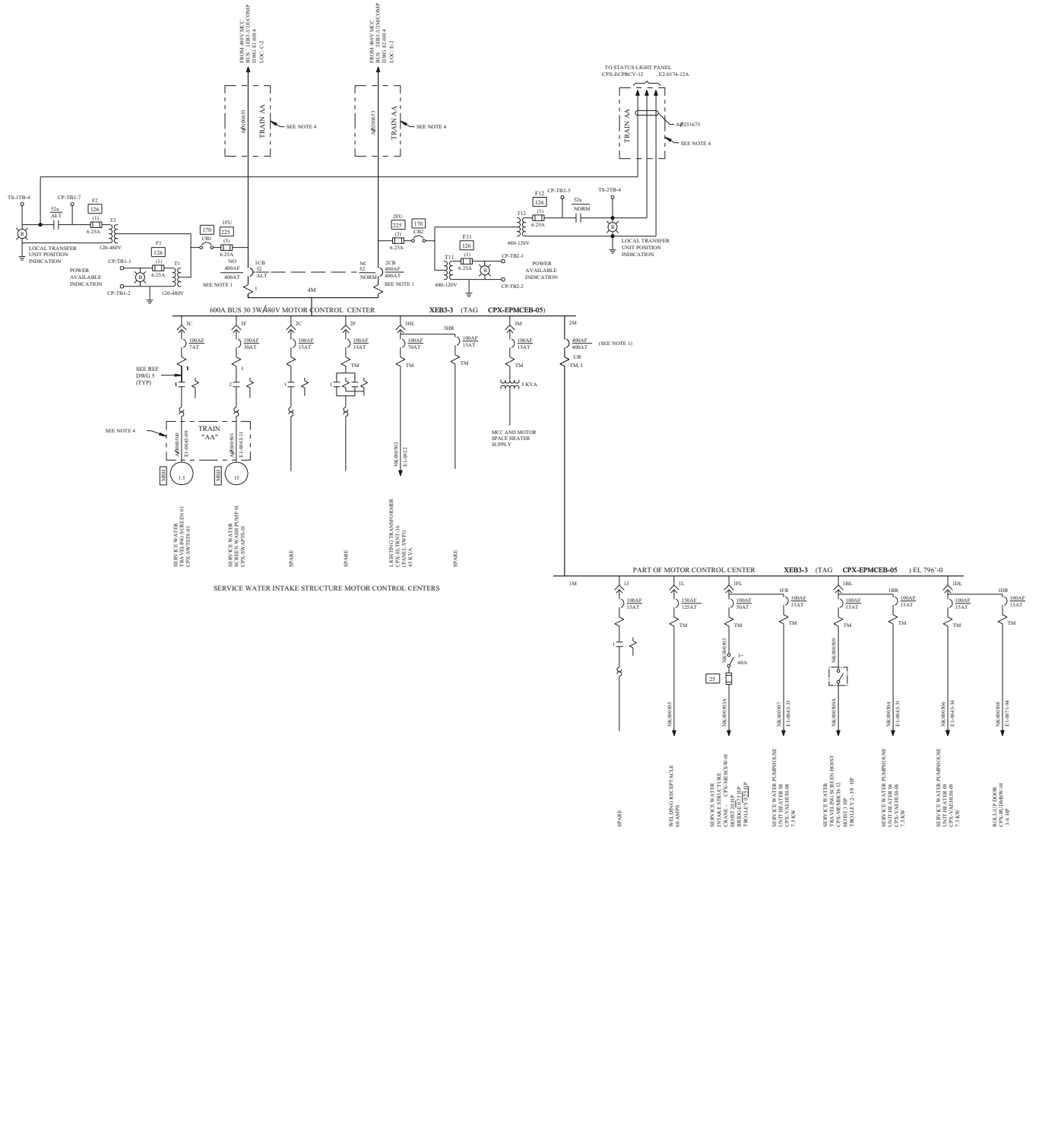
SAFETY CLASS 1 SEBMC CATEGORY I  
SAFETY CLASS 2 CLASS I  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

TXU POWER  
CPSES  
GLEN ROSE, TEXAS

SERVICE WATER INTAKE  
STRUCTURE AND  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DWG NO.	E1-0014	SH NO.	A	REV.	CP-21
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THIS DRAWING CREATED ELECTRONICALLY



### FSAR FIGURE 8.3-12

**LEGEND**

- 3M - MCC COMPARTMENT NUMBER
- TR - TRIP CIRCUIT BREAKER DISCONNECT
- M - CIRCUIT BREAKER
- AF - BREAKER FRAME SIZE
- AT - BREAKER TRIP RATING
- UR - INDICATES BREAKER WITH UNDER VOLTAGE RELEASE DEVICE
- ATU - AUTOMATIC TRANSFER UNIT
- NS - NON-FUSE DISCONNECT SWITCH
- MF - FUSED DISCONNECT SWITCH
- 2.2 - FUSE RATING
- 21 - IOM ITEM NO REF DWG 1
- TL - THERMAL OVERLOAD RELAY
- M - MAGNETIC TRIP ELEMENT
- AM - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP (SEE NOTE 1)
- TM - THERMAL MAGNETIC ELEMENT
- MS - MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER
- MSR - MOTOR STARTER COILS AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
- 2 - INDICATES MOTOR, 2 HORSEPOWER
- DT - INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)
- 120/6.25KVA - INDICATES 480-120V 3 PHASE CONTROL POWER TRANSFORMER WITH THREE PRIMARY SIDE FUSES AND ONE SECONDARY SIDE FUSE PER CIRCUIT
- 6.25A - FUSE RATING
- 121 - FUSE/BKR BSM ITEM NUMBER REF DWG 1
- o - INDICATES TERMINAL AT 480V MCC
- MSH - MOTOR SPACE HEATER
- o - INDICATING LIGHT B-(BLUE), R-(RED)
- ICB - AUTOMATIC TRANSFER UNIT CIRCUIT BREAKER 1

**NOTES**

- BREAKER XEB3-32M BAR TRIPS ON LOSS OF POWER TO MCC (UNDER VOLTAGE). THIS ALSO OCCURS WHEN THE MCC POWER SOURCE IS TRANSFERRED FROM UNIT 2 TO UNIT 1 OR BACK.
- THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
- INTERTRIPPING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 2000-2400 SYMMETRICAL AMPERES. ALL EQUIPMENT AND CABLES SHOWN ON THIS DRAWING ARE NON-CLASS 1E TRAIN C EXCEPT THE CABLES ENCLOSED INSIDE THE DASHED LINES. THE ASSOCIATED CLASS 1E TRAIN AA TRIP POWER CABLE SHALL BE ROUTED IN CONJUNCTION WITH THE TRIP POWER CABLE PER 2123-ES-106 SPEC. APPENDIX F SKETCHES 106A-E-120 OR 106A-E-110 OR INSTALL FUSES PER 2123-ES-106 SPEC. APPENDIX F SKETCH 106A-E-119.
- SEE REFERENCE DRAWING 2 FOR BREAKER O/LH SETTINGS.
- 100AF BREAKER TO BE REPLACED WITH 100AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.

- REFERENCES**
- EI-001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2
  - EI-3400 PROTECTIVE DEVICE SETTINGS
  - EI-0024-04 DEVICE LEVEL ONE LINE DIAGRAM FUSE/BREAKER BILL OF MATERIAL
  - EI-0014-D TRAIN A, B, AND C CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA
  - EI-001-02 PLANT SUPPORT POWER ONE LINE DIAGRAM

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS: CLASS 1 CATEGORY 1  
SAFETY CLASS: CLASS 1 CATEGORY 1  
SAFETY CLASS: CLASS 1 CATEGORY 1

**TXU ELECTRIC**  
CPSES  
GLEN ROSE, TEXAS

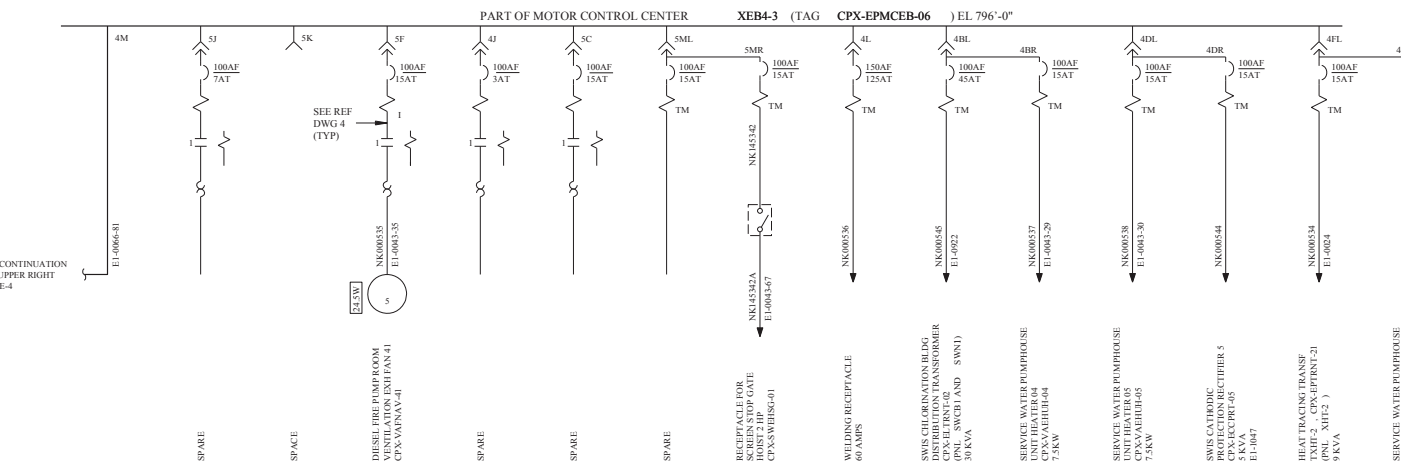
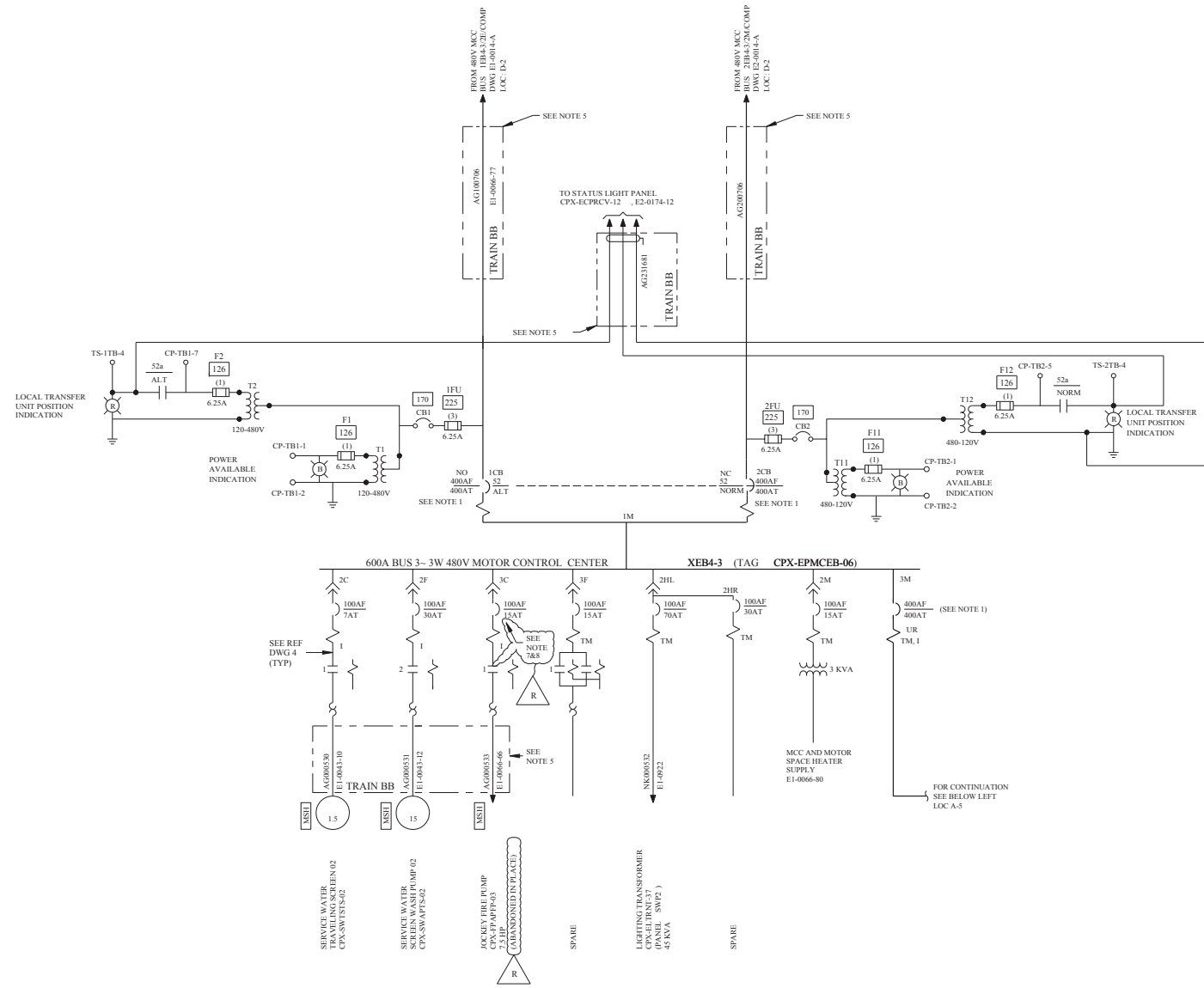
**SERVICE WATER INTAKE STRUCTURE AND SAFEGUARD 480V MCC'S ONE LINE DIAGRAM**

DWG NO: EI-0014  
REV: B  
SHEET NO: H  
REV: CP-9

REV: CP-9  
DATE: 11/08/00  
THIS DRAWING REVISION TO INCORPORATE DESIGN CHANGE DCN 13230 REV 9

SASSON/TESSARS

THIS DRAWING CONTAINS ELECTRONICALLY



REV	DWN	CHK	APPV	REMARKS
CP-9	08-17	SM	2001	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-1999-000115-02-00 PER 98-0001-99-000115-02-00

- LEGEND**
- 2M - MCC COMPARTMENT NUMBER
  - DRAWOUT BREAKER DISCONNECT
  - 3' - 3' CIRCUIT BREAKER
  - AF - AF-BREAKER FRAME SIZE
  - AT - AT-BREAKER TRIP RATING
  - UR - INDICATES BREAKER WITH UNDER VOLTAGE RELEASE DEVICE
  - AUTOMATIC TRANSFER UNIT
  - THERMAL OVERLOAD RELAY
  - MAGNETIC TRIP ELEMENT
  - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP-SEE NOTE 11
  - THERMAL MAGNETIC ELEMENT
  - MOTOR STARTER COIL AND CONTACT (NON REVERSING)
  - NEMA SIZE 2 STARTER
  - MOTOR STARTER COILS AND CONTACTS (REVERSING)
  - NEMA SIZE 1 STARTER
  - INDICATES MOTOR, 2 HORSEPOWER (NOTE 3)
  - INDICATES DISTRIBUTION TRANSFORMER
  - 480-240/120V-1 PHASE (FOR SPACE HEATERS)
  - INDICATES 480-120V 3 PHASE CONTROL POWER TRANSFORMER
  - WITH THREE PRIMARY SIDE FUSES AND ONE SECONDARY SIDE FUSE (PER CIRCUIT)
  - 6.25A - FUSE RATING
  - 151 - FUSE-BKR BM ITEM NUMBER REF DWG 3
  - MOTOR SPACE HEATER WITH "X" WATT RATING
  - INDICATES TERMINAL AT 480V MCC
  - MSH - MOTOR SPACE HEATER
  - NON-FUSE DISCONNECT SWITCH
  - INDICATING LIGHT B-(BLUE), R-(RED)
  - ICB - AUTOMATIC TRANSFER UNIT CIRCUIT BREAKER 1
  - INDICATES SPLICE

- NOTES**
- BREAKER XEB4-3/3M/BKR TRIPS ON LOSS OF POWER TO MCC (UNDERVOLTAGE). THIS ALSO OCCURS WHEN THE MCC POWER SOURCE IS TRANSFERRED FROM UNIT 2 TO UNIT 1 OR BACK.
  - THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  - MCC STARTER IS USED ONLY TO BLOCK PUMP START DURING BLACKOUT SEQUENCE.
  - INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 2500 RMS SYMMETRICAL AMPERES.
  - ALL EQUIPMENT AND CABLES SHOWN ON THIS DRAWING ARE NON-CLASS 1E TRAIN C EXCEPT THE CABLES ENCLOSED INSIDE THE DASHED LINE THAT ARE ASSOCIATED CLASS 1E, TRAIN BB.
  - SEE REFERENCE DRAWING 2 FOR BREAKER/OLH SETTINGS.
  - 100AF BREAKER TO BE REPLACED WITH 150AF BREAKER WHEN REPLACEMENT OF BREAKER IS NEEDED UNLESS OTHERWISE NOTED.
  - BREAKER TO BE MAINTAINED IN THE "OFF" POSITION. JOCKEY PUMP X-03 IS ABANDONED IN PLACE.

- REFERENCE DRAWINGS**
- E1-0001 PLANT ONE LINE DIAGRAM (UNITS 1 AND 2)
  - E1-2400 PROTECTIVE DEVICE SETTINGS
  - E1-0024-04 DEVICE LEVEL ONE LINE DIAGRAM FUSE/BREAKER BILL OF MATERIAL
  - E1-0014-D TRAIN A, B, AND C CONTROL POWER XFMR FUSE AND CONTROL CIRCUIT LOADING DATA
  - 212B7150-2 MCC 1E/4-3 OUTLINE SUMMARY
  - 212B7150-5, 6 MCC XEB4-3 OUTLINE SUMMARY

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

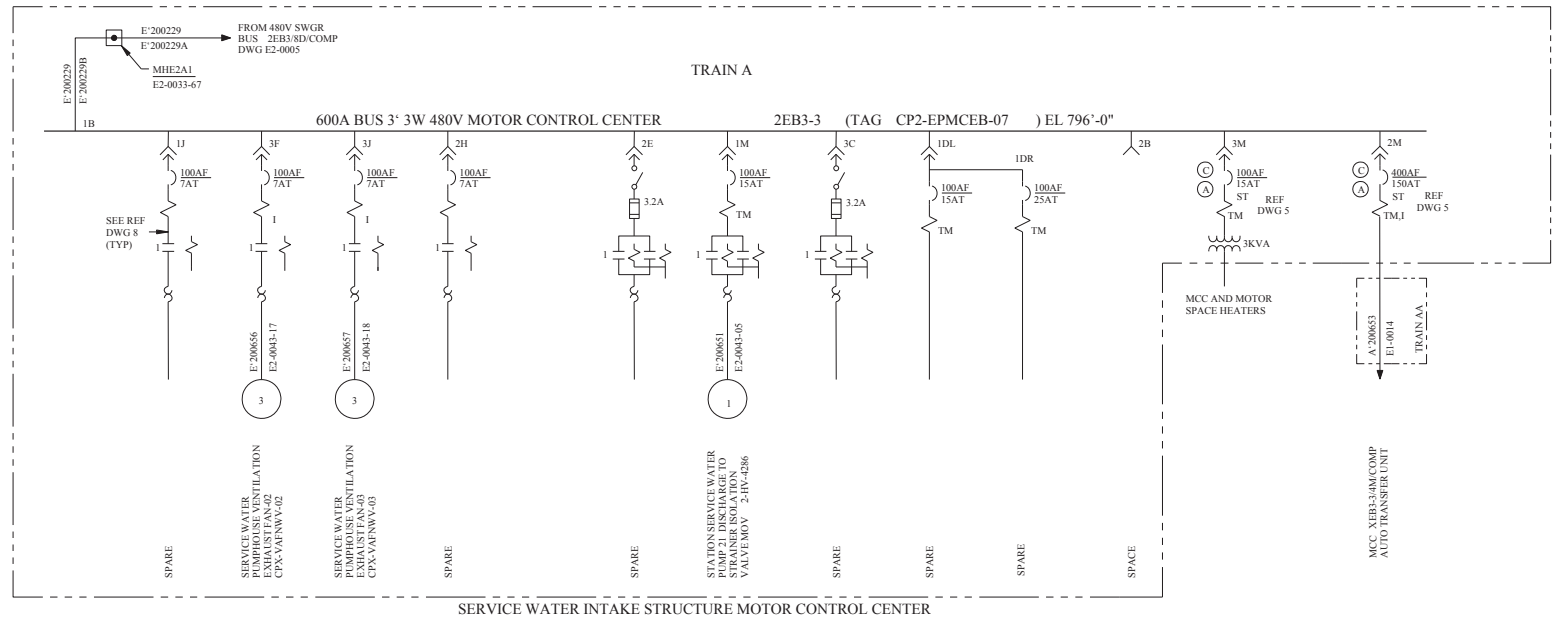
**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

**SERVICE WATER INTAKE**  
STRUCTURE AND  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

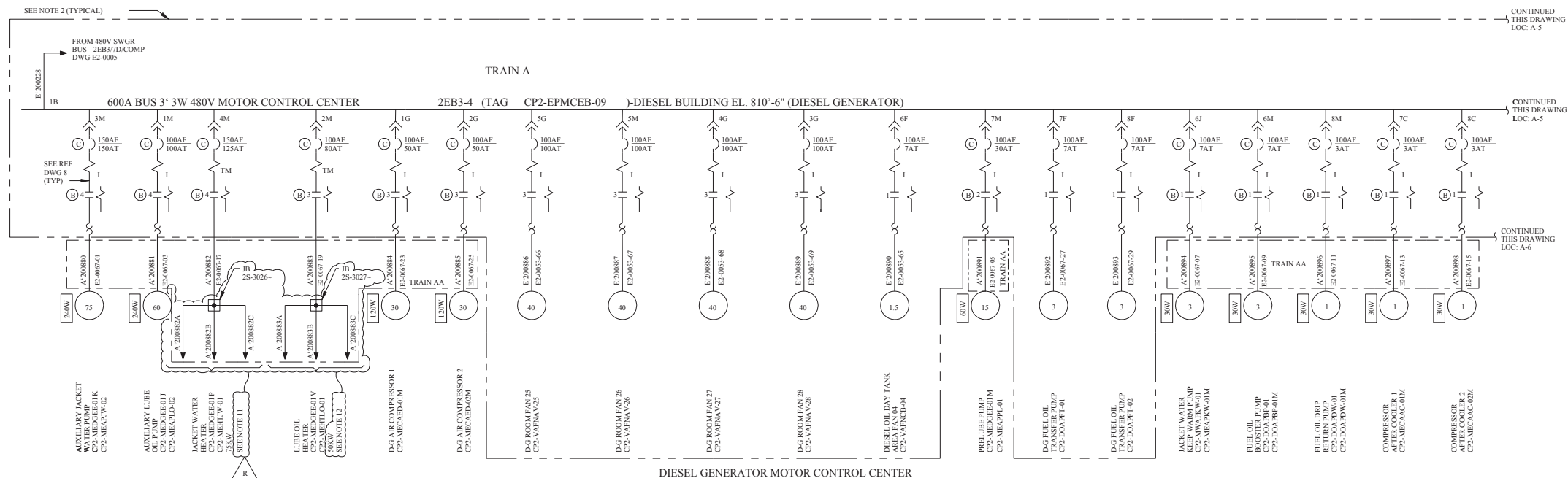
DWG NO. E1-0014 SH NO. C REV. CP-9

DRAWING E1-0014-A	REV CP-10
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0014-A	
E1-0014-B	
E1-0014-C	
E1-0014-D	

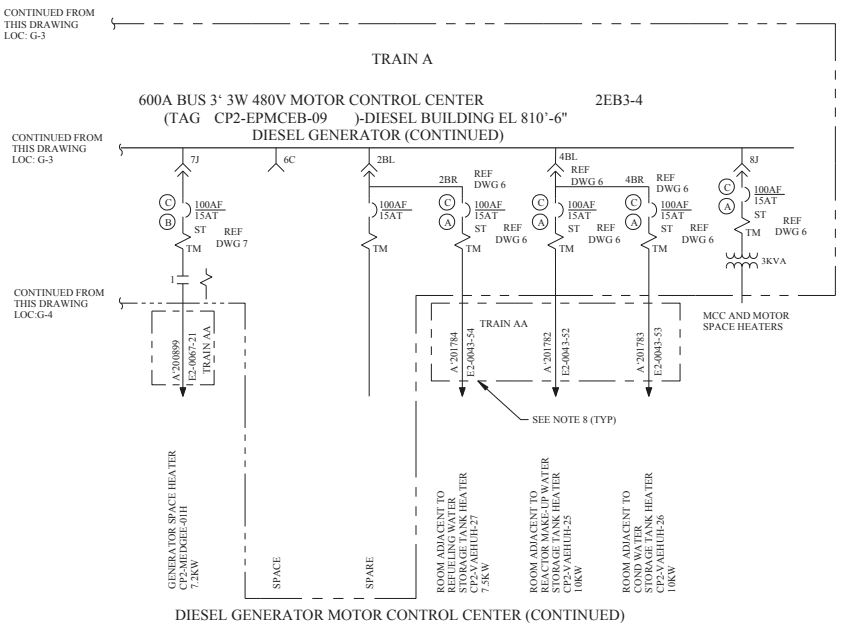




SERVICE WATER INTAKE STRUCTURE MOTOR CONTROL CENTER



DIESEL GENERATOR MOTOR CONTROL CENTER



DIESEL GENERATOR MOTOR CONTROL CENTER (CONTINUED)

REV	BY	CHKD	APPD	REMARKS
CP-15	SM	10-12	2001	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2001-002353-01-00 PER 98-0001-01-002353-01-00

FSAR FIGURE 8.3-12

- LEGEND**
- 2M - MCC COMPARTMENT NUMBER
  - DRAWOUT BREAKER DISCONNECT
  - 3F - 3' CIRCUIT BREAKER
  - AF - AF-BREAKER FRAME SIZE
  - AT - AT-BREAKER TRIP RATING
  - ST - INDICATES BREAKER WITH SHUNT TRIP DEVICE
  - 3' 30 AMP FUSED SWITCH
  - 3.2 - 3.2 AMP FUSE TRIP RATING
  - THERMAL OVERLOAD RELAY
  - MAGNETIC TRIP ELEMENT
  - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SEE NOTE 9
  - TM - THERMAL MAGNETIC ELEMENT
  - MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER
  - MOTOR STARTER COILS AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
  - 2 - INDICATES MOTOR (2 HORSEPOWER)
  - INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)
  - MOTOR SPACE HEATER WITH X WATT RATING
  - FEEDER TO LOCAL STARTER OR CONTACTOR AT EQUIPMENT
  - (A) - SEE NOTE 10
  - (B) - SEE NOTE 10
  - (C) - SEE NOTE 10
  - JUNCTION BOX

- NOTES**
1. ALL MOTOR AND FEEDER RATINGS GIVEN IN HP UNLESS OTHERWISE NOTED.
  2. EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
  3. DELETED
  4. DELETED
  5. DELETED
  6. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25000 RMS SYMMETRICAL AMPERES.
  8. CABLES ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E TRAIN AA OR TRAIN BB AS NOTED.
  9. **FOR BREAKER/OLH SETTING SEE REFERENCE DRAWING 4.**
  10. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY (A) NEXT TO THE BREAKER/STARTER AS FOLLOWS:
    - (A) - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)
    - (B) - TRIPPED BY SAFETY INJECTION SEQUENCER (AUTO LOCKOUT CONTACT (SIS/AL))
  11. THIS IS A 3-3' HEATER. FOR CONNECTION DETAILS SEE REF DRAWING 9.
  12. THIS IS A 3-3' HEATER. FOR CONNECTION DETAILS SEE REF DRAWING 10.

**REFERENCES**

1. E1-0014	480V AUXILIARIES ONE LINE-SAFEGUARD BUSES
2. E1-0001	PLANT ONE LINE DIAGRAM - UNITS 1 AND 2
3. E2-0005	480V AUXILIARIES ONE LINE-SAFEGUARD BUSES PROTECTIVE DEVICE SETTINGS
4. E2-2400	LOAD SHEDDING SCHEMATIC DIAGRAM
5. E2-0066-74	LOAD SHEDDING SCHEMATIC DIAGRAM
6. E2-0066-82	AUX RELAY SCHEMATIC AND CONNECTION DIAGRAM
7. E2-0067-37	CONTROL POWER XFMR FUSE & CONTROL CIRCUIT LOADING DATA
8. E2-0014-B	JACKET WATER HEATER TAG CP2-MEHTJW-01
9. E2-0067-17	LUBE OIL HEATER TAG CP2-MEHTLO-01
10. E2-0067-19	LUBE OIL HEATER TAG CP2-MEHTLO-01

DRAWING	E2-0014	REV	CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0014			
E2-0014-A			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

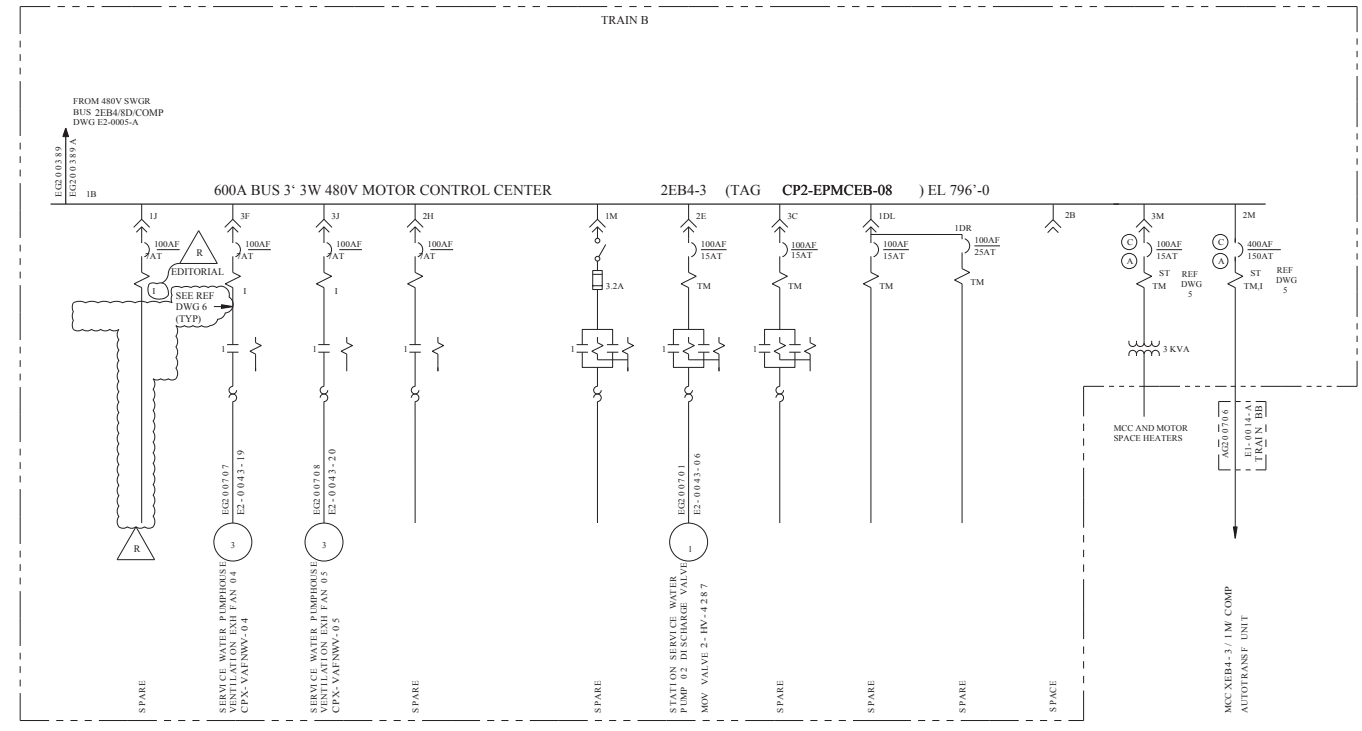
SERVICE WATER INTAKE  
STRUCTURE & DIESEL GENERATOR  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DWG NO.	E2-0014	SH NO.	REV.	CP-15



REV	DWN	CHKD	APVD	REMARKS
20-13	09-11-2013	09-11-2013		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2013-000129-01-00 PER SR-0002-13-000129-01-00 EDITORIAL CHANGE AS NOTED

**FSAR FIGURE 8.3-12**



**LEGEND**

- 2M - MCC COMPARTMENT NUMBER
- DRAWOUT BREAKER DISCONNECT
- 3' - 3' CIRCUIT BREAKER
- AF - BREAKER FRAME SIZE
- AT - BREAKER TRIP RATING
- ST - INDICATES BREAKER WITH SHUNT TRIP DEVICE
- TM - THERMAL MAGNETIC ELEMENT
- 3' 30 AMP FUSED SWITCH
- 3.2 - 3.2 AMP FUSE TRIP RATING
- THERMAL OVERLOAD RELAY
- MAGNETIC TRIP ELEMENT ADJUSTABLE
- INSTANTANEOUS MAGNETIC TRIP (SEE NOTE 9)
- MOTOR STARTER COIL AND CONTACT (NON REVERSING) NEMA SIZE 2 STARTER
- MOTOR STARTER COILS AND CONTACTS (REVERSING) NEMA SIZE 1 STARTER
- 2 - INDICATES MOTOR LOAD RATED 2 HORSEPOWER
- INDICATES DISTRIBUTION TRANSFORMER 480-240/120V-1 PHASE (FOR SPACE HEATERS)
- A - SEE NOTE 10
- C - SEE NOTE 10

- NOTES**
1. ALL MOTOR AND FEEDER RATINGS GIVEN IN HP UNLESS OTHERWISE NOTED.
  2. - - - - - EQUIPMENT/CABLES ENCLOSED INSIDE DASHED LINE ARE CLASS 1E, TRAIN A OR TRAIN B AS NOTED. EQUIPMENT OUTSIDE THE DASHED LINE IS NON-1E, UON.
  3. DELETED
  4. DELETED
  5. DELETED
  6. THERMAL OVERLOAD RELAYS FOR CLASS 1E MOTOR OPERATED VALVES ARE USED FOR ALARM ONLY.
  7. INTERRUPTING RATING OF MCC COMBINATION STARTERS AND FEEDER CIRCUIT BREAKERS IS 25000 RMS SYMMETRICAL AMPERES
  8. - - - - - CABLES ENCLOSED INSIDE THE DASHED LINE IS (ARE) ASSOCIATED CLASS 1E TRAIN AA OR TRAIN BB AS NOTED.
  9. FOR BREAKER/OLH SETTING SEE REFERENCE DRAWING 4
  10. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY LOAD CIRCUIT BREAKER, COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE LOAD CIRCUIT BREAKER, AND TRIPPING THE CIRCUIT BREAKER OR STARTER BY SAFETY INJECTION SIGNAL INDICATED BY NEXT TO THE BREAKER/STARTER AS FOLLOWS:
    - TRIPPED BY SAFETY INJECTION ACTUATION SIGNAL (SIAS)

**REFERENCE DRAWINGS**

1. E1-0014	480V AUXILIARIES ONE LINE-SAFEGUARD BUSES (UNITS 1 AND 2)
2. E1-0001	PLANT ONE LINE DIAGRAM (UNITS 1 AND 2)
3. E2-0005	480V AUXILIARIES ONE LINE-SAFEGUARD BUSES PROTECTIVE DEVICE SETTINGS
4. E2-2400	LOAD SHEDDING SCHEMATIC DIAGRAM
5. E2-0066-76	CONTROL POWER XTMR FUSE AND CONTROL CIRCUIT LOADING DATA
6. E2-0014-C	

DRAWING E2-0014-A	REV CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0014-A	
E2-0014-B	

DRAWING E2-0014-A	REV CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0014-A	
E2-0014-C	

DRAWING 2323-E2-0014	REV CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0014	
E2-0014-A	

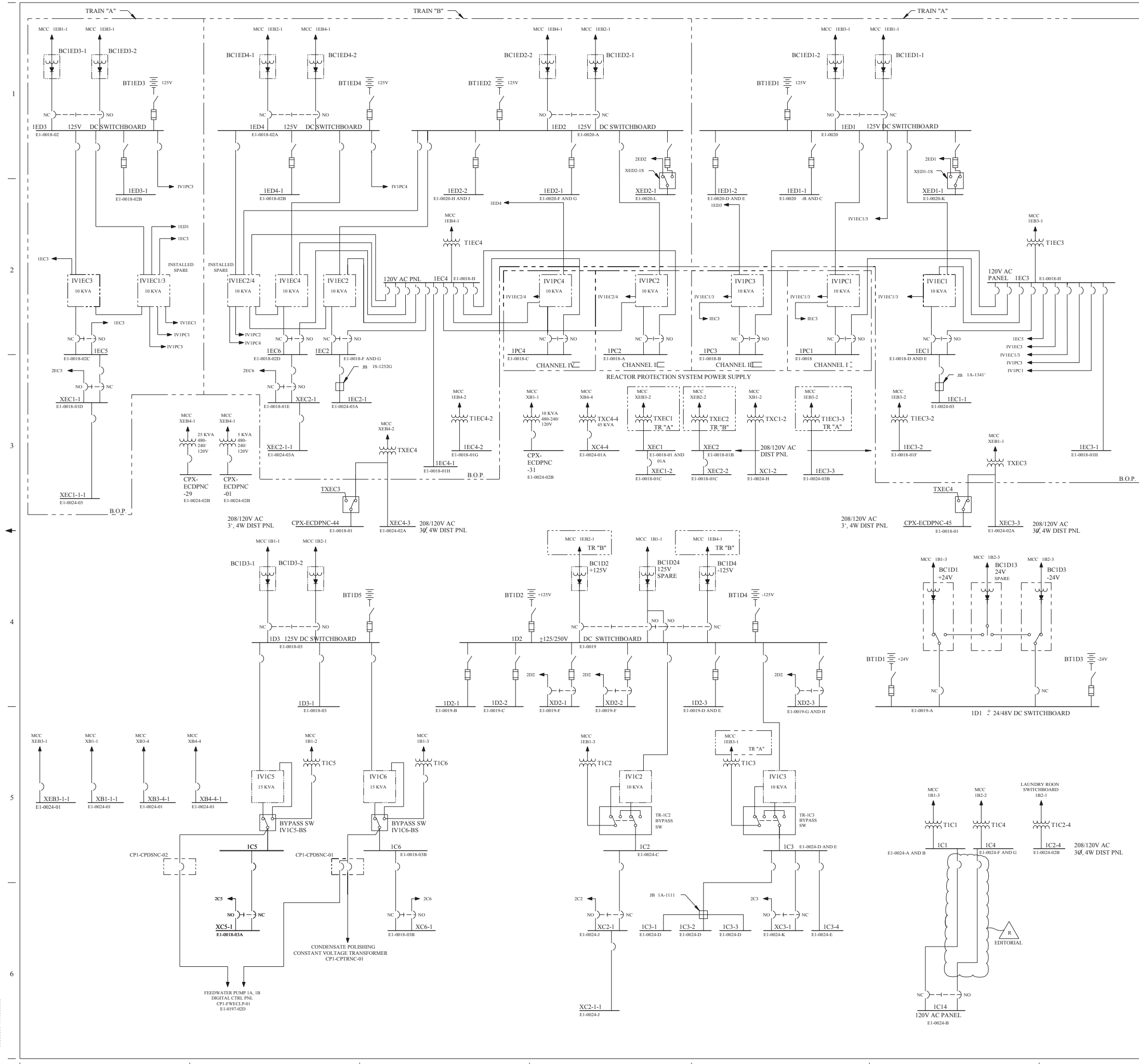
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

SERVICE WATER INTAKE  
STRUCTURE AND DIESEL GENERATOR  
SAFEGUARD 480V MCC'S  
ONE LINE DIAGRAM

DWG. NO.	SH. NO.	REV.
E2-0014	A	CP-13

\$\$\$\$\$DATE\$\$\$\$\$



REV	DWN	CHKD	APVD	REMARKS
CP-18	E1-001	200	200	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FROM 2006-03-09 16:40 PER SAC 0012-06-00000-16-00 EDITORIAL CHANGE AS NOTED

FSAR FIGURE 8.3-13

**LEGEND**

- INVERTERS, \* KVA RATING
- BATTERY, \* VOLTAGE
- BYPASS SWITCH
- MANUAL TRANSFER SWITCH
- AIR CIRCUIT BREAKER
- AUTOMATIC TRANSFER SWITCH
- MECHANICALLY INTERLOCKED BREAKERS
- BATTERY CHARGER SOLID-STATE
- FUSIBLE SWITCH
- AS NOTED - TAP BOX OR JUNCTION BOX

**NOTES**

1. --- EQUIPMENT AND WIRING ENCLOSED IN DASHED LINE IS CLASS IIE.
2. THOSE BREAKERS WITHOUT POSITION INDICATED ARE NORMALLY IN CLOSED POSITION.
3. DELETED.
4. FOR OTHER LOADS ON AC AND DC BUSES NOT SHOWN ON THIS DRAWING SEE REFERENCE DWGS BELOW FOR DETAILS.
5. FOR UNIT 2 AC AND DC PANEL ONE LINE DIAGRAM SEE DWG E1-0001-01 MAIN PLANT ONE LINE DIAGRAM UNIT 2.

**REFERENCES**

E1-0001 PLANT ONE LINE DIAGRAM UNITS 1 AND 2  
E2-001-A PLANT ONE LINE DIAGRAM (UNIT 2)

CLASS I

(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY 1  
SAFETY CLASS 3 CLASS IIE ASSOCIATED CIRCUITS

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

PLANT ONE LINE DIAGRAM  
UNIT 1 AND COMMON  
DISTRIBUTION PANELS

DRAWING 2323-E1-0001	REV CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0001	
E1-0001-A	

DWG NO E1-0001	SH NO A	REV CP-18
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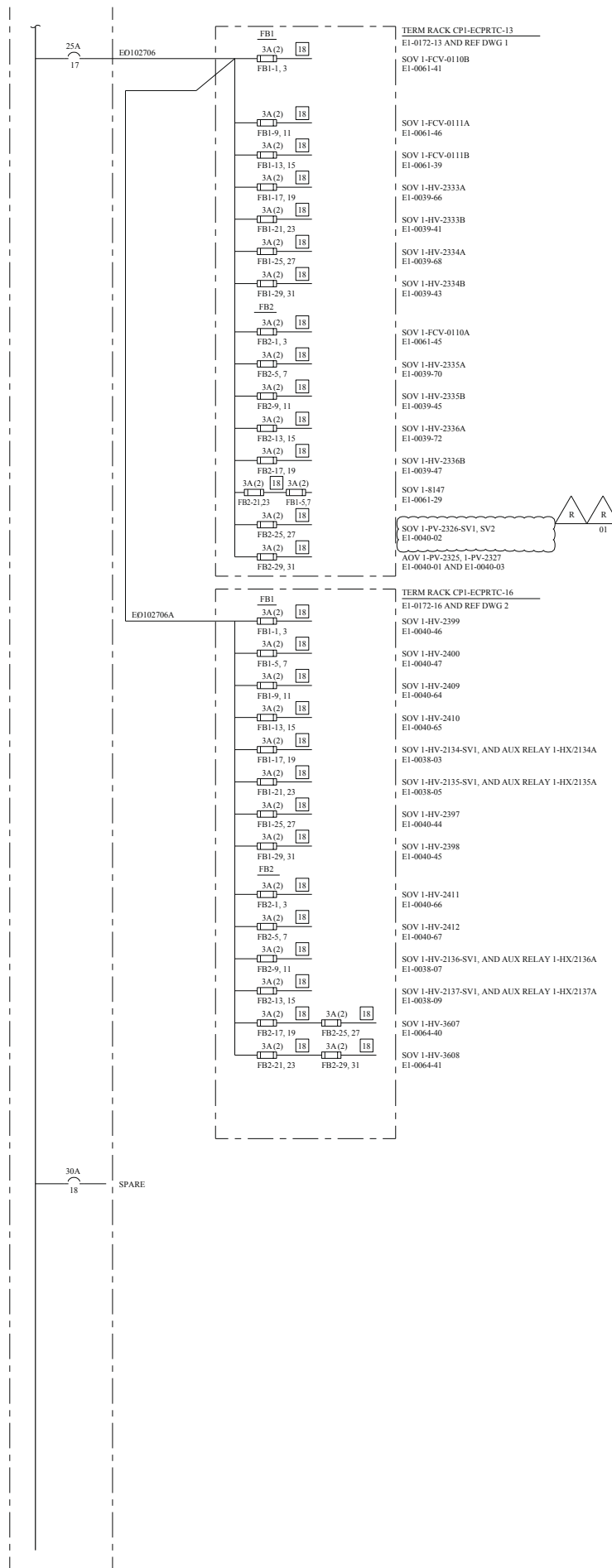








125V DC DISTRIBUTION PANEL 1ED1-1  
CONT FROM DWG E1-0020-B LOC E6



REV	DWN	CHK	APPV	REMARKS	
CP-8	12-01	2006	12-01	2006	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2001-002426-01-01 PER SK-001-01-002426-01-01

FSAR FIGURE 8.3-14

- LEGEND
- CIRCUIT BREAKER
  - 80A - CIRCUIT BREAKER RATING
  - 1 - CIRCUIT NO
  - FUSE
  - (2) - QUANTITY
  - FB1-1 - FUSE LOCATION MARKER
  - 18 - FUSE B/M ITEM NUMBER REF DWG 4

- NOTES
1. ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E TRAIN A.
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 100AF, 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.

- REFERENCE DRAWINGS
1. W-TC13701-D SH 1, 2
  2. W-TC16701-D SH 1, 2
  3. M-99X0701-D SH 1
  4. E1-0024-04

DRAWING	E1-0020	REV	CP-7
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0020	E1-0020-K		
E1-0020-B			
E1-0020-C			
E1-0020-D			
E1-0020-E			

TRAIN A  
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SERBMC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

LUMINANT  
CPSES  
GLEN ROSE, TEXAS

125V DC  
ONE LINE DIAGRAM

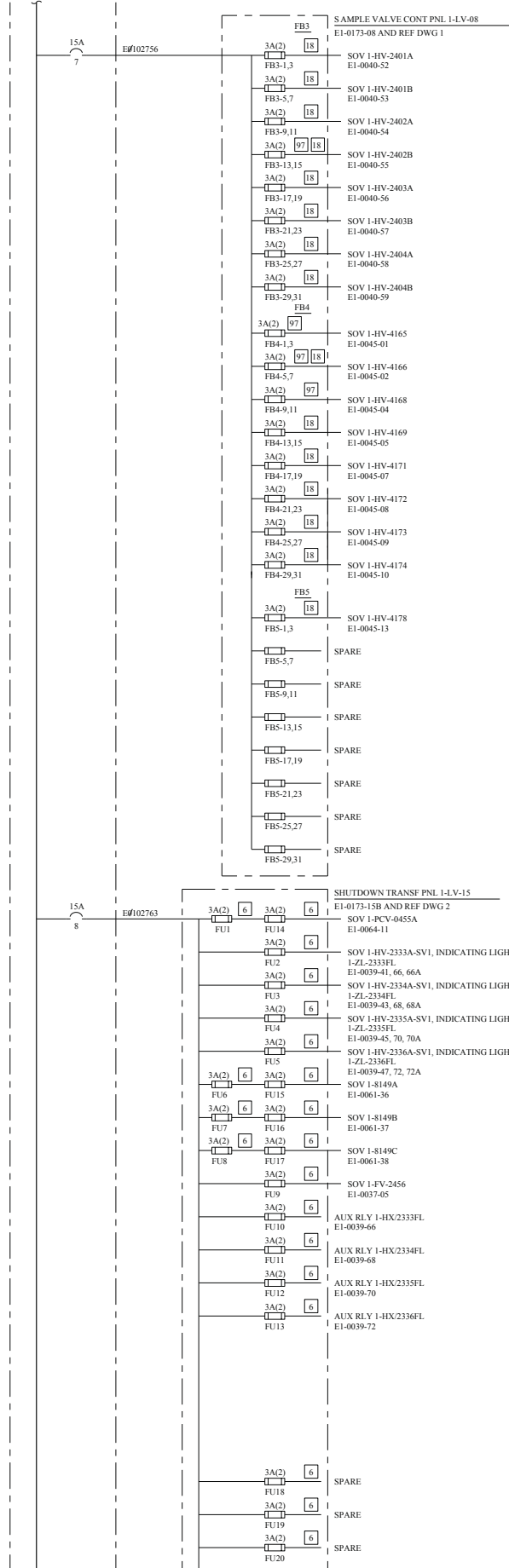
DWG NO.	E1-0020	SH. NO.	C	REV.	CP-8
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THIS DRAWING CREATED ELECTRONICALLY

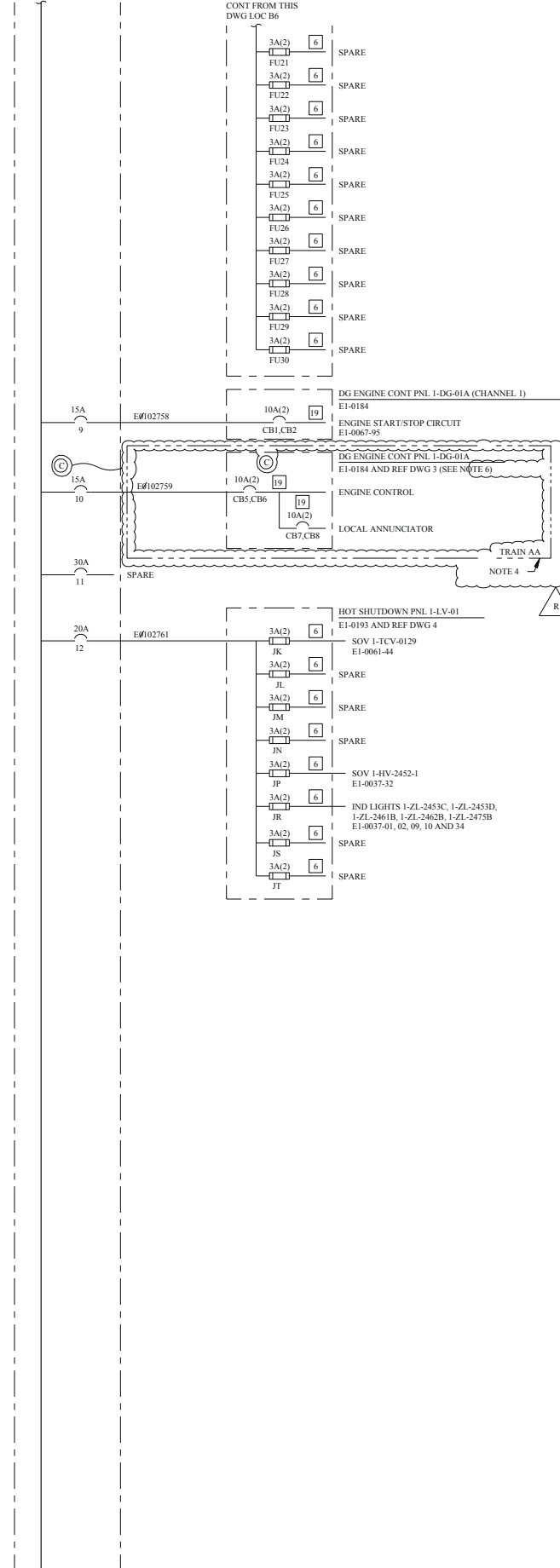




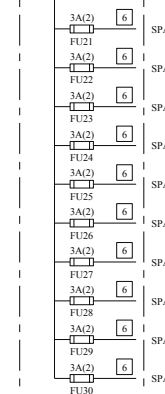
125V DC DISTRIBUTION PANEL IED1-2  
CONT FROM DWG E1-0020-D LOC E6



CONT FROM THIS DWG LOC A6



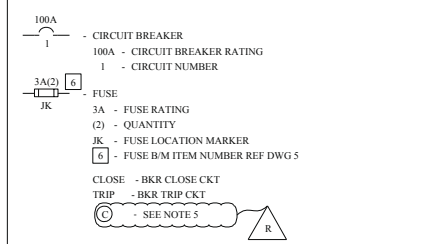
CONT FROM THIS DWG LOC B6



REV	DWN	CHKD	APPD	REMARKS
CP-11	MM	MM	MM	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-1999-002406-02-00 PER 98-0074-99-002-006-02-00

FSAR FIGURE 8.3-14

LEGEND



NOTES

- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E, TRAIN A.
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 100AF, 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
- ALL WIRING AND CABLING ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS 1E, TRAIN AA. THE FUNCTION OF THE LOAD IS NOT SAFETY RELATED AND THE LOAD CIRCUIT BREAKER IS CLASS 1E.
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO CIRCUIT BREAKERS, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER.
- ALL INTERNALS, COMPONENTS AND WIRING SUPPLIED BY THE FEEDER CIRCUIT BREAKERS ARE NON-CLASS 1E, TRAIN C.

REFERENCE DRAWINGS

- W-1V08805-F SH 1, 2, 3
- W-1LV152861-F SH 2, 4
- 09-500-76001 SH 4, 6, 7
- W-99X03934-F SH 7, 8, 9
- E1-0024-04

DRAWING	E1-0020	REV	CP-7
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0020	E1-0020-K		
E1-0020-B			
E1-0020-C			
E1-0020-D			
E1-0020-E			

TRAIN A  
CLASS I  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY 1  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

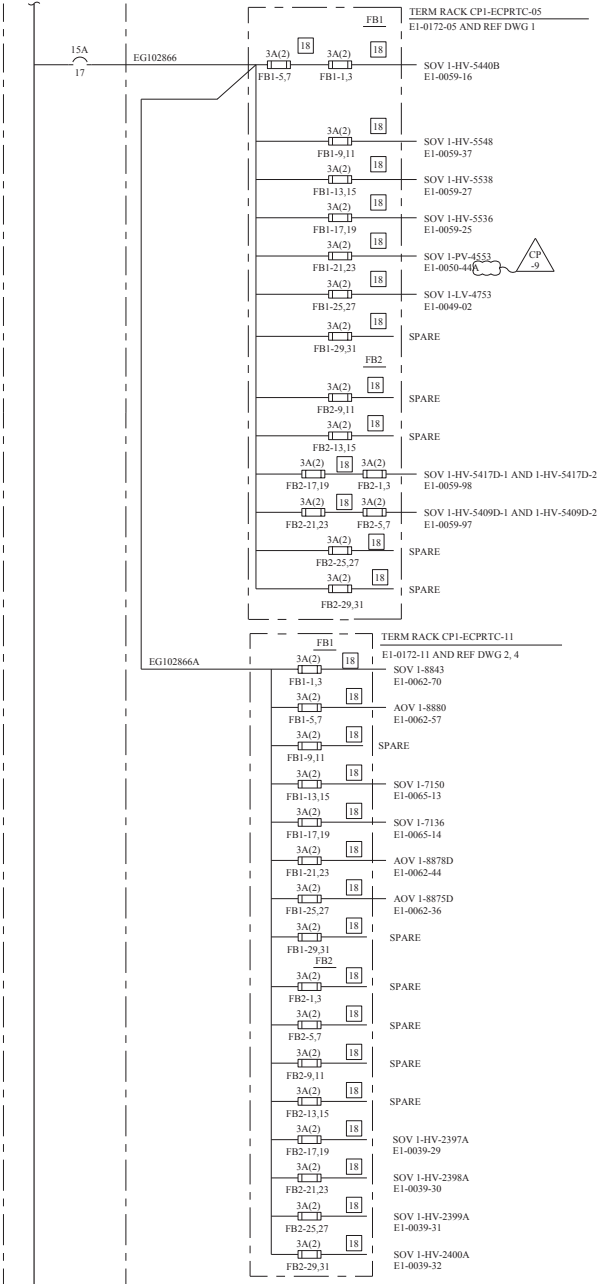
TXU POWER  
CPSES  
GLEN ROSE, TEXAS

125V DC  
ONE LINE DIAGRAM

DWG NO.	E1-0020	SH NO.	E	REV.	CP-11
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125V DC DISTRIBUTION PANEL 1ED2-1  
CONT FROM DWG E1-0020-F LOC E6



REV	DATE	BY	CHKD	APPV	REMARKS
CP-9	05-14-2013				THIS DRAWING REVISED TO INCORPORATE ALCR-2015-06601-1 TO EDITORIALY CORRECT REFERENCE DRAWING NUMBER FROM E1-0050-44 TO E1-0050-44A.

FSAR FIGURE 8.3-14

- LEGEND:
- CIRCUIT BREAKER
  - CIRCUIT BREAKER RATING
  - CIRCUIT NO
  - FUSE
  - FUSE RATING
  - QUANTITY
  - FUSE LOCATION MARKER
  - FUSE B.M ITEM NUMBER REF DWG 3

- NOTES:
1. ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E.
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.

- REFERENCE DRAWINGS:
1. W-TC05701-D SH 1
  2. W-TC11701-D SH 1, 2
  3. E1-0024-04
  4. VE1-TC11701-D SH 2

DRAWING	E1-0020-A	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0020-A	E1-0020-L		
E1-0020-F			
E1-0020-G			
E1-0020-H			
E1-0020-J			

TRAIN B  
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

125V DC  
ONE LINE DIAGRAM

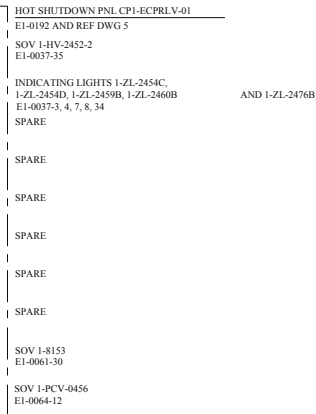
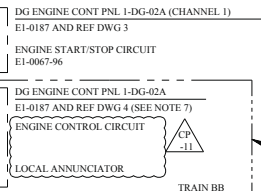
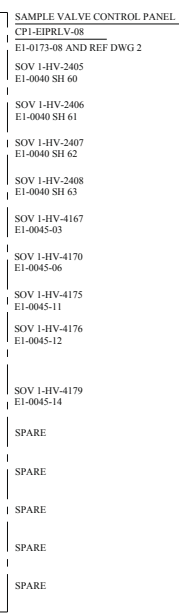
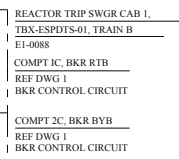
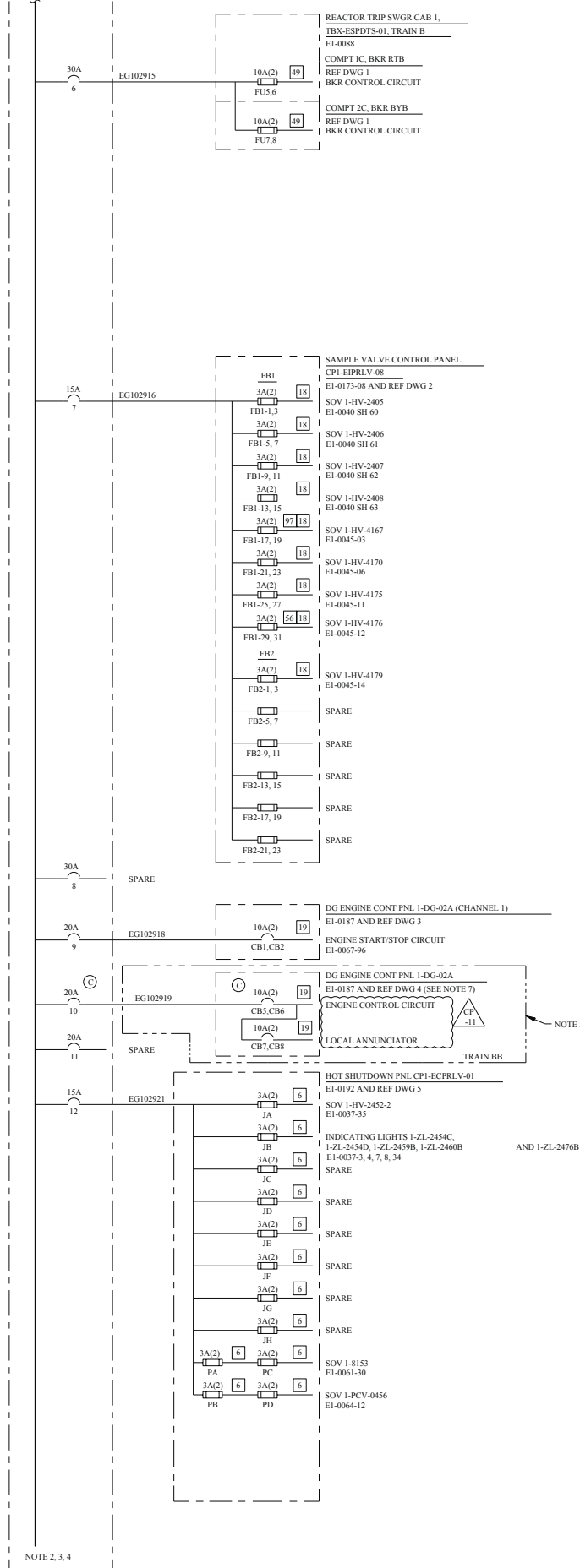
DWG NO. E1-0020	SHEET NO. G	REV. CP-9
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THIS DRAWING CREATED ELECTRONICALLY

SSSSSSSSSSSSSSSSSS



125V DC DISTRIBUTION PANEL 1ED2-2  
CONT FROM DWG E1-0020-H LOC E6



REV	DATE	BY	CHKD	APPVD	REMARKS
CP-11	08-14-2011				THIS DRAWING REVISED TO INCORPORATE AN EDITORIAL CHANGE AS NOTED PER AL-CR-2011-005409-1.

FSAR FIGURE 8.3-14

- LEGEND
- 100A - CIRCUIT BREAKER
  - 100A - CIRCUIT BREAKER RATING
  - 1 - CIRCUIT NUMBER
  - 3A(2) - FUSE
  - 3A - FUSE RATING
  - (2) - QUANTITY
  - JA - FUSE LOCATION MARKER
  - 18 - FUSE B/M ITEM NUMBER REF DWG 6
  - Ⓢ - SEE NOTE 6

- NOTES
- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E.
  - ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - FOR SELECTIVE COORDINATION WITH THE SWITCHBOARD, DISTRIBUTION PANEL CIRCUIT BREAKER RATINGS MUST NOT EXCEED THE FOLLOWING:
    - a. 40AT FOR THERMAL MAGNETIC NON-ADJUSTABLE TRIP
    - b. 100AT FOR THERMAL MAGNETIC INSTANTANEOUS ADJUSTABLE TRIP
  - EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
  - ALL WIRING AND CABLING ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS 1E, TRAIN BB. THE FUNCTION OF THE LOAD IS NOT SAFETY RELATED AND THE LOAD CIRCUIT BREAKER IS CLASS 1E.
  - ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO CIRCUIT BREAKERS, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER.
  - ALL INTERNALS, COMPONENTS AND WIRING SUPPLIED BY THE FEEDER CIRCUIT BREAKERS ARE NON-CLASS 1E, TRAIN C.

- REFERENCE DRAWINGS
- 7026D76, 7026D77, 7026D78
  - W-LV08805-F SH 1, 2, 3
  - 09-500-76001 SH 3, 8
  - 09-500-76001 SH 4, 6, 8
  - W-99X03934-F SH 7, 9, 14
  - E1-0024-04

DRAWING	E1-0020-A	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0020-A	E1-0020-L		
E1-0020-F			
E1-0020-G			
E1-0020-H			
E1-0020-J			

TRAIN B

**CLASS 1**  
(NUCLEAR SAFETY RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY 1  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

125V DC  
ONE LINE DIAGRAM

DWG. NO.	SH. NO.	REV.
E1-0020	J	CP-11

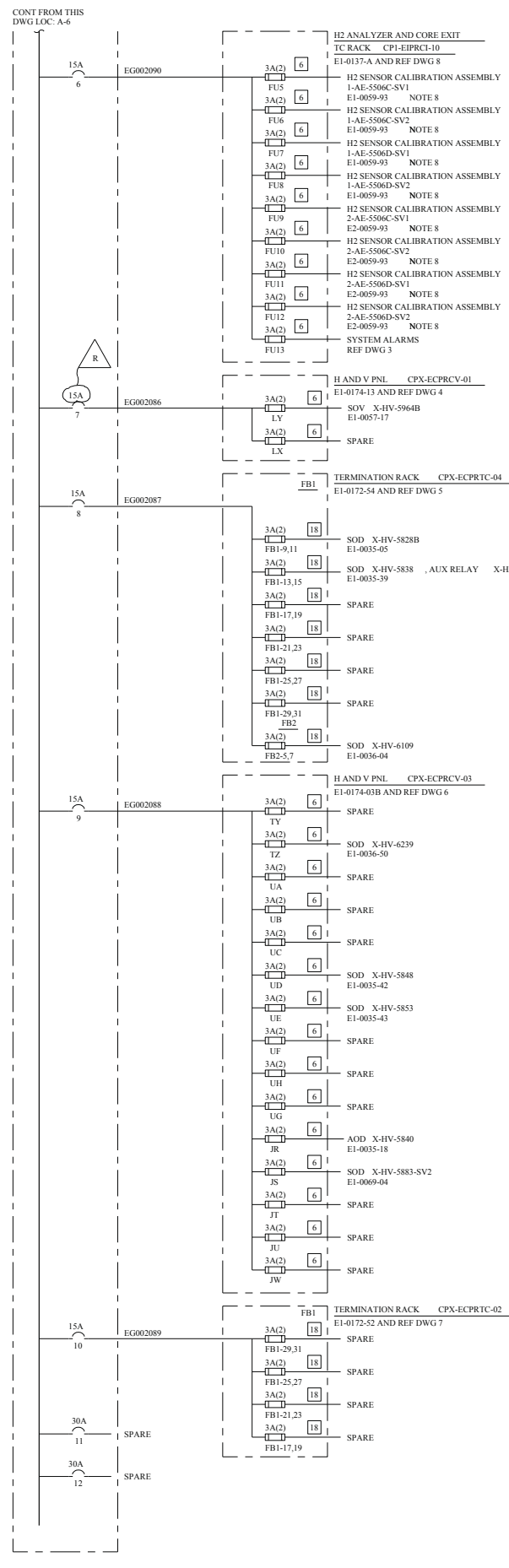
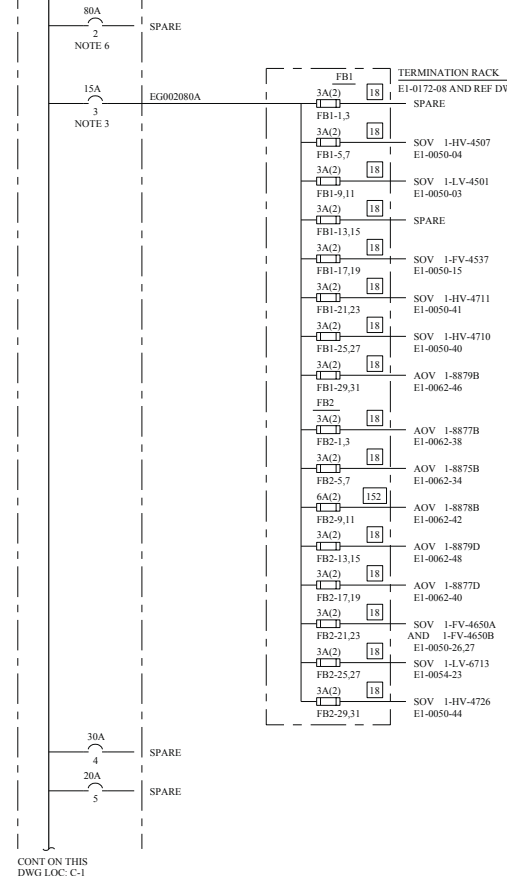
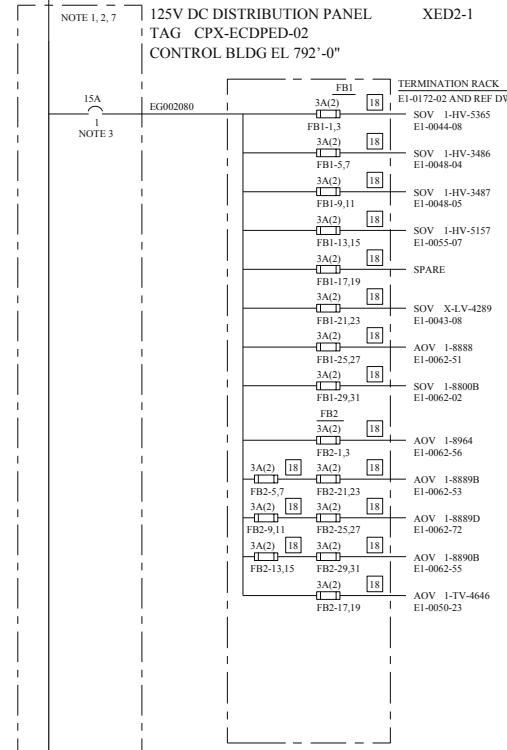
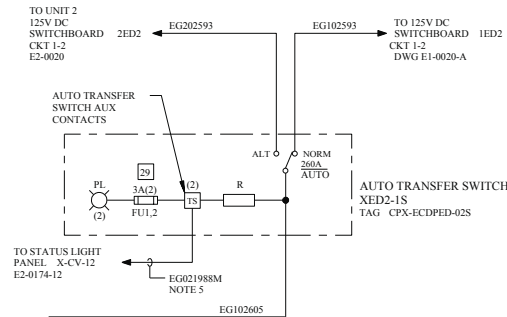
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\$\$\$\$\$DATE\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY







REV	DWN	CHK	APPV	REMARKS
CP-23	10L 06-02 2009	SM 06-02 2009		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2001-002265-04-01 PER 98-0001-01-002265-04-00

**FSAR FIGURE 8.3-14**

LEGEND

	20A	- CIRCUIT BREAKER
	20A	- CIRCUIT BREAKER RATING
	1	- CIRCUIT NUMBER
	3A(2)	- FUSE
	3A	- FUSE RATING
	(2)	- QUANTITY
	FB1-1	- FUSE LOCATION MARKER
	18	- FUSE BM ITEM NUMBER REF DWG 9

- NOTES
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
  - TO ENSURE PROPER PROTECTION OF CABLES DERATED FOR THFA, DO NOT INCREASE THE AMPACITY OF THIS CIRCUIT BREAKER.
  - ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E.
  - CABLE NUMBERS WITH SUFFIX M ARE THE SAME AS THE CORRESPONDING CABLE NUMBER WITH SUFFIX N ON THE RESPECTIVE DRAWING.
  - 225 AMP FRAME BREAKER WITH ADJUSTABLE INSTANTANEOUS TRIP. SEE REF DWG 10.
  - FOR SELECTIVE COORDINATION WITH THE SWITCHBOARD, DISTRIBUTION PANEL CIRCUIT BREAKER RATINGS MUST NOT EXCEED THE FOLLOWING:
    - 40AT FOR THERMAL MAGNETIC NON-ADJUSTABLE TRIP
    - 100AT FOR THERMAL MAGNETIC INSTANTANEOUS ADJUSTABLE TRIP
  - POST ACCIDENT MONITORING SYSTEM HYDROGEN ANALYZERS (TRAIN A AND B) ARE COMMON ANALYZERS FOR BOTH UNITS 1 AND 2 (REF DBD-ME-079 SECTION 5.1). ANALYZERS ARE POWERED FROM COMMON 118V AC DISTRIBUTION PANELS. THE ANALYZERS RECEIVE INPUTS FROM HYDROGEN DETECTORS LOCATED IN THE CONTAINMENT BUILDINGS OF BOTH UNITS 1 AND 2. THOUGH THE HYDROGEN DETECTORS HAVE THE UNUTILIZED TAG NUMBERS (e.g. 1- or 2-), THEIR OUTPUT IS ANALYZED BY THE COMMON HYDROGEN ANALYZERS. THEREFORE THE DETECTORS ARE ALSO POWERED FROM COMMON 125V DC DISTRIBUTION PANELS TO ASSURE AND MAINTAIN COMPATIBILITY OF POWER SUPPLY FOR THE DETECTORS AND THE ANALYZERS.
  - THESE UNIT 1 LOADS HAVE BEEN ANALYZED AND ACCEPTED PER FDA-2000-000142-02-02.
  - THE ONLY UNUTILIZED ACCEPTABLE LOADS ON PANEL XED2-1 ARE SHOWN IN NOTES 8 AND 9. NO NEW UNIT 1 OR UNIT 2 LOADS SHALL BE ADDED ON PANEL XED2-1.

- REFERENCE DRAWINGS
- W-TC02701-D SH 1, 2 WIRING DIAGRAM TERMINATION CABINET
  - W-TC08701-D SH 1, 2 WIRING DIAGRAM TERMINATION CABINET
  - 112D003 SH 2 WIRING AND CONN DIAG CORE COOLING MONITOR
  - W-CV01701-F SH 7, 16 WIRING DIAG MAIN CONT RM PNL VERT
  - W-TC04832-D SH 1, 2 WIRING DIAG TERM CAB CPX-ECPRTC-04 WD TERM CAB TRAIN B
  - W-CV03701-F SH 7, 10, 13 WIRING DIAG CONT RM VERT BD V PNL CPX-ECPRCV-03 WD MN CONT RM VV
  - W-TC02832-D SH 1, 2 WIRING DIAGRAM TERM CAB CPX-ECPRTC-02 WD TERM CAB TR B
  - 105D017 WIRING AND CONNECTION DIAGRAM
  - E1-0024-04 DEVICE LEVEL ONE LINE DIAGRAM FUSE-BREAKER BILL OF MATERIAL
  - E1-2400-361 PROTECTIVE DEVICE SETTINGS DC SYSTEM

DRAWING	E1-0020-A	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0020-A	E1-0020-L		
E1-0020-F	E1-0020-L		
E1-0020-G	E1-0020-L		
E1-0020-H	E1-0020-L		
E1-0020-J	E1-0020-L		

TRAIN B

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

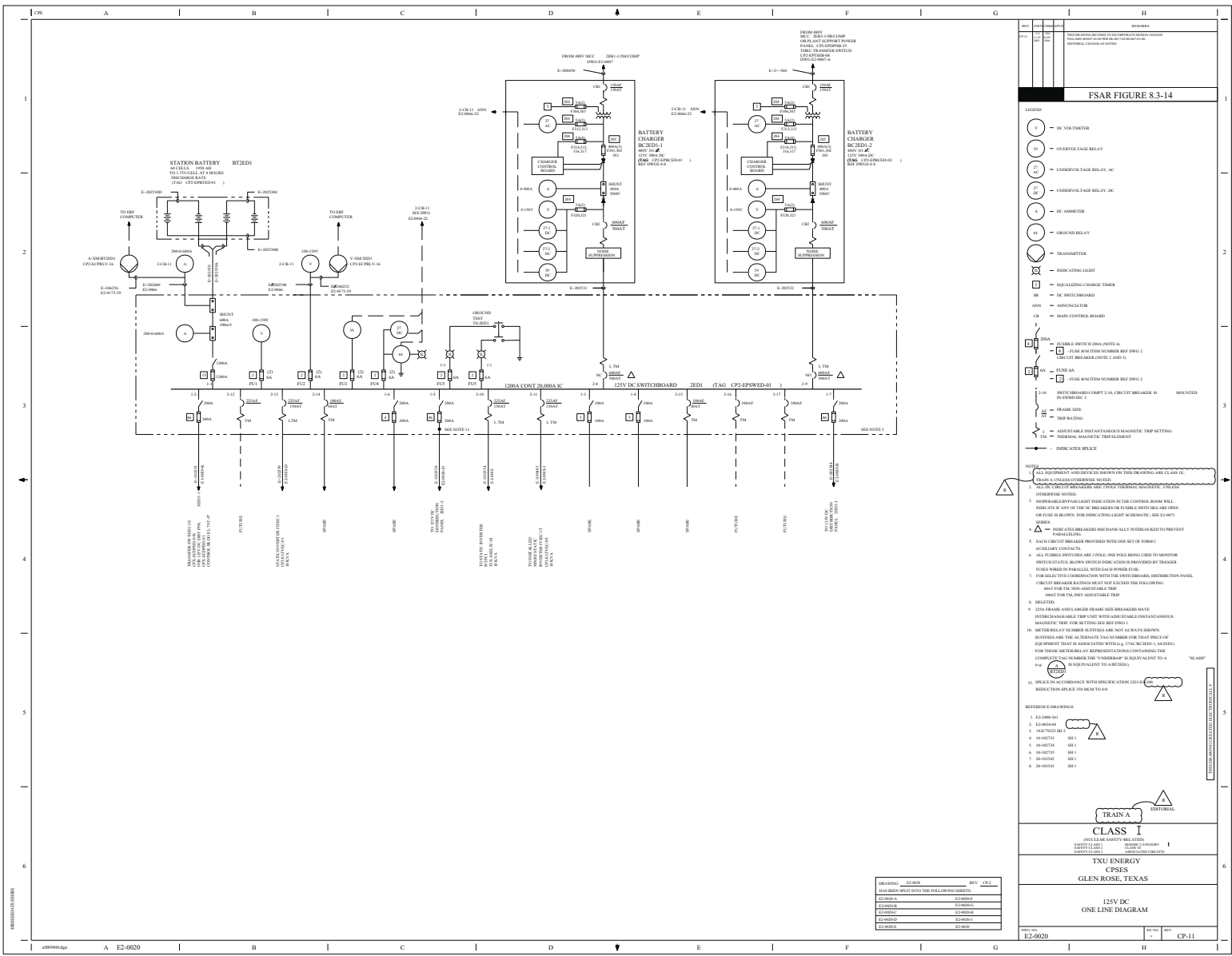
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

125V DC  
ONE LINE DIAGRAM

DWG NO.	E1-0020	SH NO.	L	REV.	CP-23
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THIS DRAWING CREATED ELECTRONICALLY



**FSAR FIGURE 8.3-14**

**LEGEND**

- V = DC VOLTMETER
- OV = OVERVOLTAGE RELAY
- UN = UNDERVOLTAGE RELAY, AC
- UN = UNDERVOLTAGE RELAY, DC
- AM = DC AMMETER
- GR = GROUND RELAY
- TR = TRANSMITTER
- IL = INDICATING LIGHT
- CC = COIL/LOADING CHARGER TIMER
- DC = DC SWITCHBOARD
- ANN = ANNUNCIATOR
- CR = MAIN CONTROL BOARD

**NOTES**

1. ALL EQUIPMENT AND DEVICES SHOWN ON THIS DRAWING ARE TO BE AS SHOWN IN THE AS-BUILT DOCUMENTATION.
2. ALL DC CIRCUIT BREAKERS ARE TYPE THERMAL-MAGNETIC, UNLESS OTHERWISE NOTED.
3. INOPERABLE FAULT LIGHT INDICATION IN THE CONTROL ROOM WILL INDICATE IF ANY OF THE 16 BREAKERS IS INOPERABLE WITH AN OPEN OR FUSED IN POSITION FOR INDICATING LIGHT AS SHOWN, SEE E-2-0017.
4. INDICATES BREAKERS MECHANICALLY INTERLOCKED TO PREVENT PARALLELING.
5. EACH CIRCUIT BREAKER PROVIDED WITH ONE SET OF FORMIC ALTERNATE CONTACTS.
6. ALL FUSIBLE DEVICES ARE 1 POLE, ONE POLE BEING USED TO MONITOR SHUNT STATUS. BEYOND SWITCH INDICATION IS PROVIDED BY TRIGGER COILS WIRING TO PANELS WITH EACH POWER FUSE.
7. FOR SELECTIVE COORDINATION WITH THE SWITCHBOARD, DISTRIBUTION PANEL CIRCUIT BREAKER RATING MUST NOT EXCEED THE FOLLOWING:
  - 100T FOR 1A, 200T-250T 2.5A, 1.75A
  - 200T FOR THE NEXT AVAILABLE RATING
8. RELATED.
9. 250A FRAME AND 1 CALIBER FRAME SIZE BREAKERS HAVE INTERCHANGEABLE TRIP UNIT WITH ADJUSTABLE INSTANT AND/OR MAGNETIC TRIP FOR SETTING AS SHOWN.
10. METOR RELAY NUMBER SUFFICES ARE NOT ALWAYS SHOWN.
11. RETURN ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IS ASSOCIATED WITH IT. TAG NUMBER IS USED FOR THOSE METOR RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER THE "SHORCUT" TAG IS EQUIVALENT TO A RETURN.
12. SPLICE TO BE COMBINED WITH SPECIFICATION 2014.4 REDUCTION SPLICE 100 MM TO 6.6

**REFERENCE DRAWINGS**

1. E-2-0003-001
2. E-2-0003-002
3. E-2-0003-003
4. E-2-0003-004
5. E-2-0003-005
6. E-2-0003-006
7. E-2-0003-007
8. E-2-0003-008

**TRAIN A**

**CLASS I**

ONE LINE AND BATTERY SYSTEM

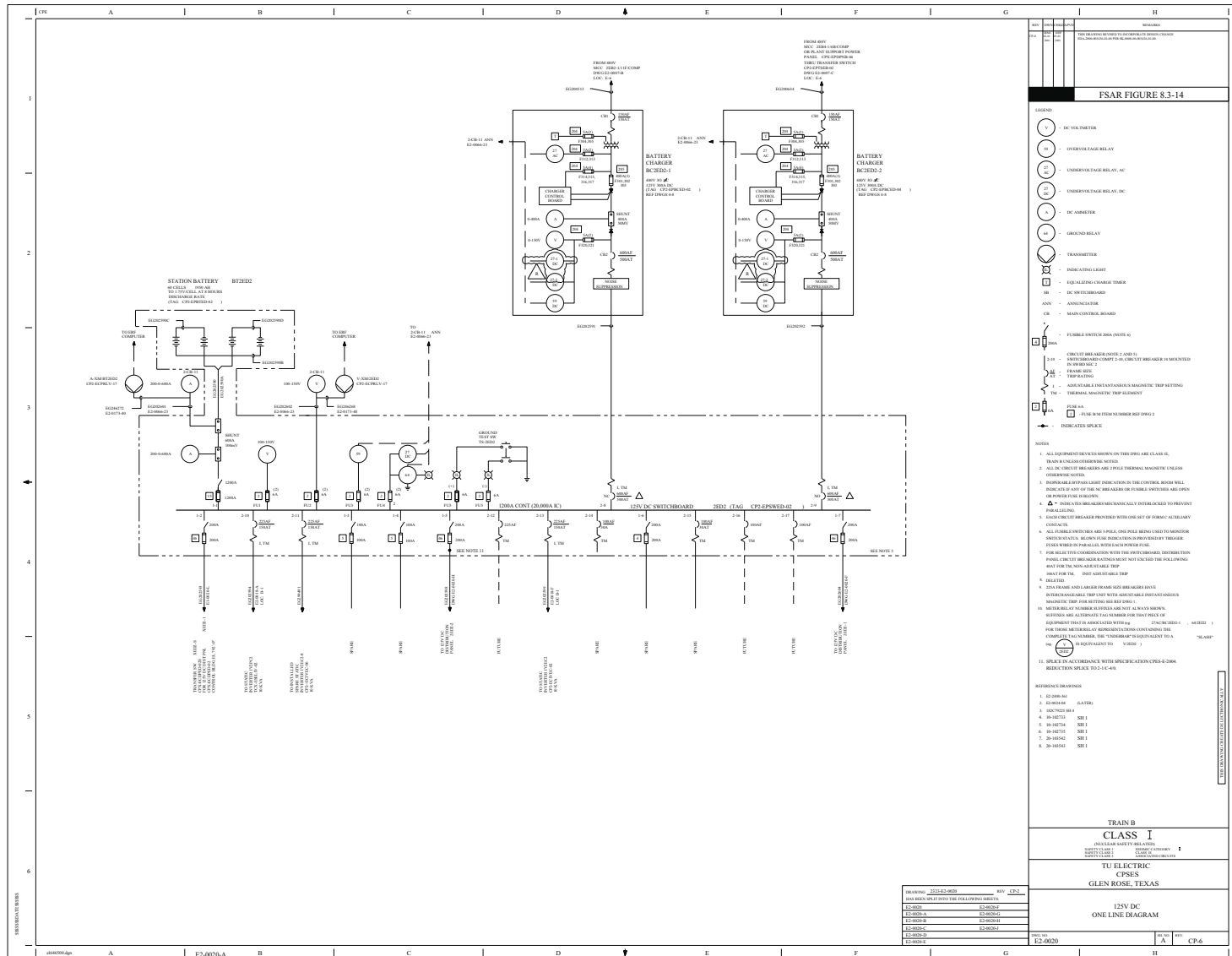
TXU ENERGY  
CPSES  
GLEN ROSE, TEXAS

**125V DC  
ONE LINE DIAGRAM**

REV: 02-0020

DRAWING	REV	BY	CHK
E-2-0003-001	E-2-0002		
E-2-0003-002	E-2-0002		
E-2-0003-003	E-2-0002		
E-2-0003-004	E-2-0002		
E-2-0003-005	E-2-0002		
E-2-0003-006	E-2-0002		





FSAR FIGURE 8.3-14

- LEGEND**
- ⊖ DC VOLT METER
  - ⊖ IN VOLTAGE RELAY
  - ⊖ UNDERVOLTAGE RELAY, AC
  - ⊖ UNDERVOLTAGE RELAY, DC
  - ⊖ DC ARMATURE
  - ⊖ GROUND RELAY
  - ⊖ TRANSMITTER
  - ⊖ INDICATING LIGHT
  - ⊖ EQUILIBRIUM CHARGE TIME
  - ⊖ DC SWITCHBOARD
  - ⊖ ANNUNCIATOR
  - ⊖ MAIN CONTROL BOARD
  - ⊖ FUSIBLE SWITCH (200A, 1000V)
  - ⊖ CIRCUIT BREAKER (200A, 1000V)
  - ⊖ SWITCHBOARD (200A, 1000V)
  - ⊖ FUSE (200A, 1000V)
  - ⊖ THERMAL MAGNETIC TRIP ELEMENT
  - ⊖ THERMAL MAGNETIC TRIP ELEMENT
  - ⊖ FUSE (200A, 1000V)
  - ⊖ FUSE (200A, 1000V)
  - ⊖ INDICATES SPLICE

- NOTES**
1. ALL COMPONENTS ARE SHOWN ON THIS DRAWING EXCEPT AS NOTED OTHERWISE.
  2. ALL DC CIRCUIT BREAKERS ARE 2-POLE THERMAL MAGNETIC (T/M) OVERCURRENT TRIP.
  3. INDICATING LIGHTS MUST BE LOCATED IN THE CONTROL ROOM WITH PROTECTIVE COVER AND BE LOCATED IN THE CONTROL ROOM AND UNDER THE POWER SUPPLY.
  4. ALL CIRCUIT BREAKERS MUST BE PROVIDED WITH AN INDEPENDENT PARALLELING.
  5. INDICATING LIGHTS MUST BE PROVIDED WITH AN INDEPENDENT PARALLELING.
  6. ALL FUSIBLE SWITCHES ARE 1-POLE, ONE-POLE TRIP AND MUST BE PROVIDED WITH AN INDEPENDENT PARALLELING.
  7. FOR RELATIVE COORDINATION WITH THE OVERCURRENT TRIP ELEMENTS, THE CIRCUIT BREAKER TRIP TIME MUST BE LESS THAN THE TRIP TIME OF THE TRIP ELEMENT.
  8. THE FUSIBLE SWITCHES MUST BE PROVIDED WITH AN INDEPENDENT PARALLELING.
  9. THE FUSIBLE SWITCHES MUST BE PROVIDED WITH AN INDEPENDENT PARALLELING.
  10. THE FUSIBLE SWITCHES MUST BE PROVIDED WITH AN INDEPENDENT PARALLELING.
  11. SPLICE IN ACCORDANCE WITH SPECIFICATION CPSES-6-2004 REDUCTION SPLICE TO 2-1/2" X 4-1/2"

**REFERENCES DRAWING**

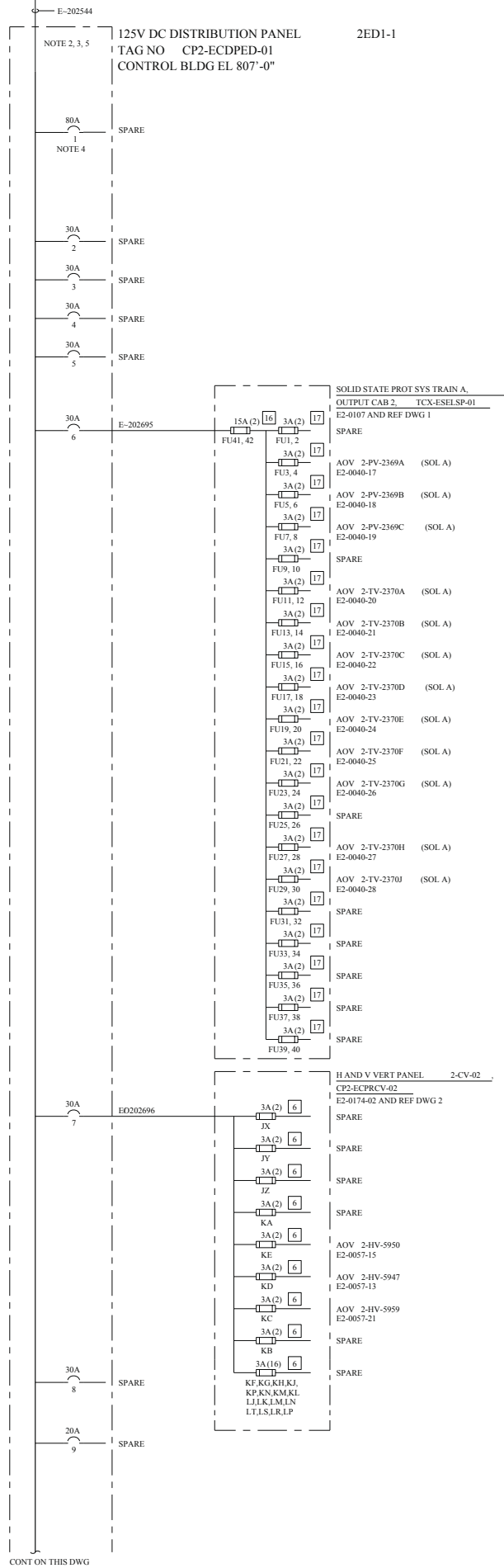
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02
CPSES-6-2004	REV. 02/02

**TRAIN B**  
**CLASS I**  
 (NON-CLASSIFIED BY REGULATORY AGENCY)  
 TU ELECTRIC  
 CPSES  
 GLEN ROSE, TEXAS

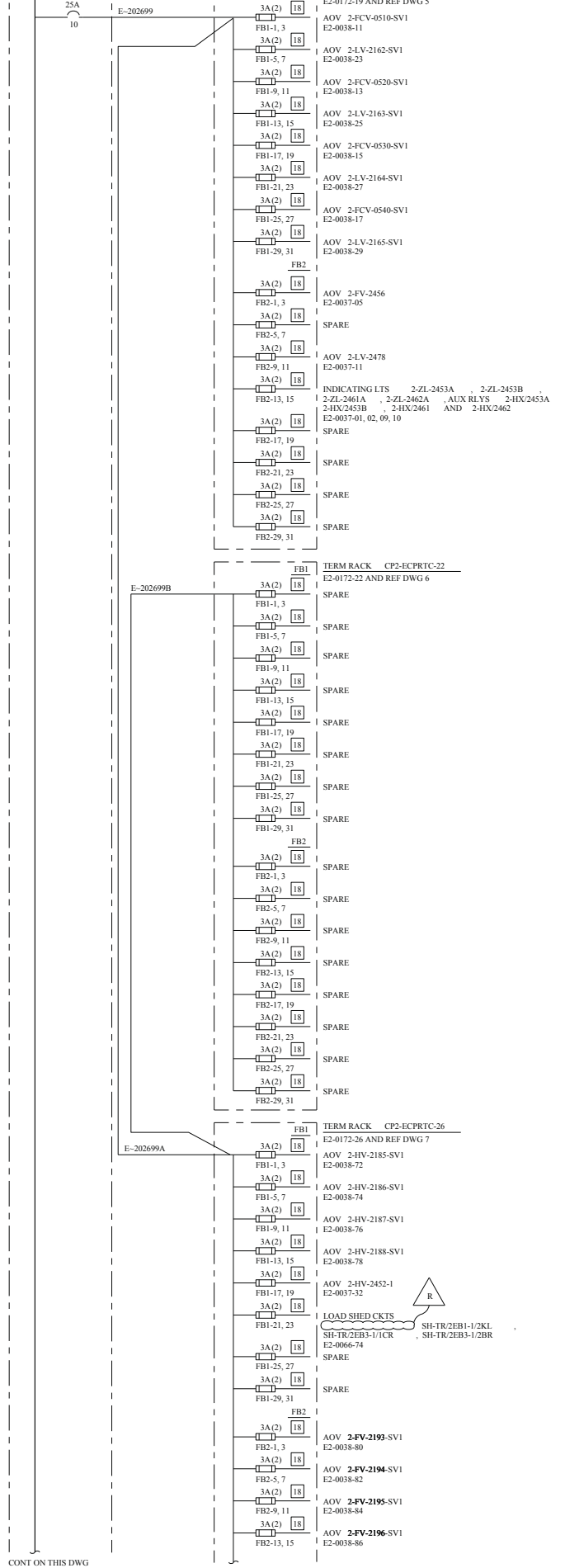
12V DC  
 ONE LINE DIAGRAM

DATE: 02/02/02  
 DRAWN BY: A  
 CHECKED BY: CP-6

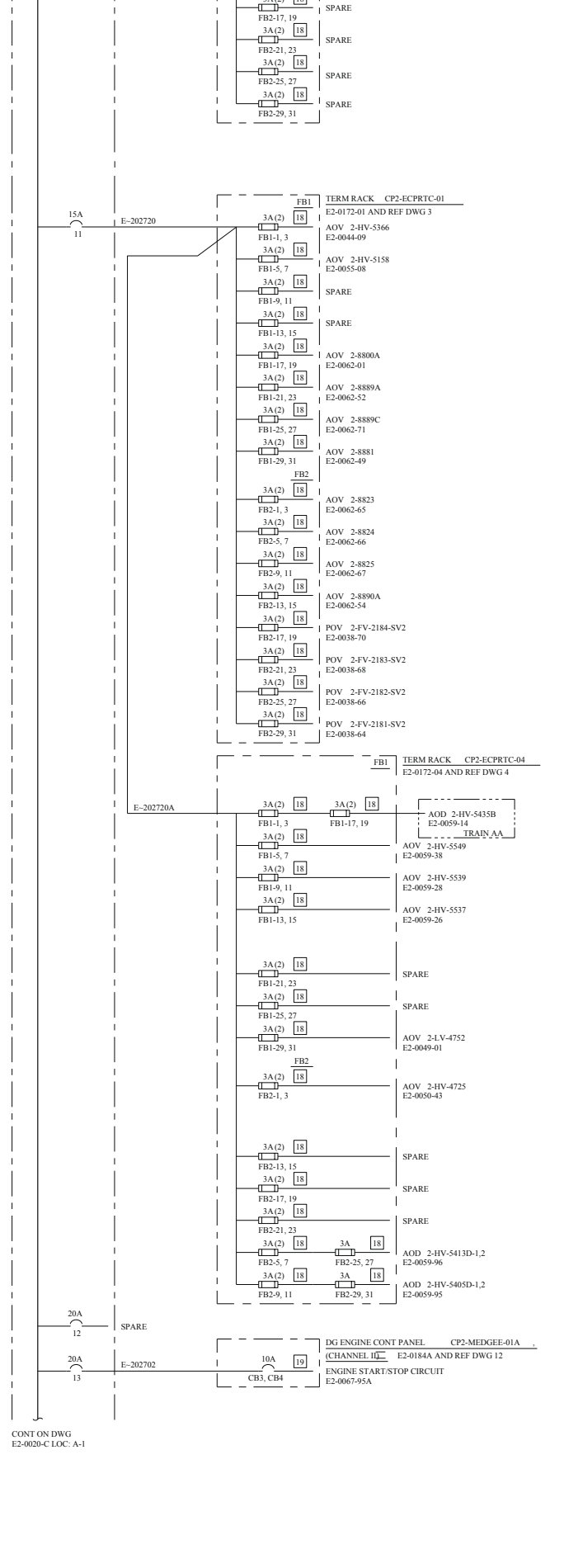
TO 125V DC SWITCHBOARD  
CKT 1-7  
DWG E2-0020



CONT FROM THIS DWG  
LOC A6



CONT FROM THIS DWG  
LOC C6



REV	DWN	CHK	APPV	REMARKS
CP-6	12-13-2004	12-27-2004		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2001-000158-01-00 PER 98-0020-01-000158-00-00

**FSAR FIGURE 8.3-14**

**LEGEND**

80A - CIRCUIT BREAKER  
80A - CIRCUIT BREAKER RATING  
17 - CIRCUIT NUMBER

3A(2) - FUSE  
3A - FUSE RATING  
(2) - QUANTITY  
FU1 - FUSE LOCATION MARKER  
17 - FUSE/B/M ITEM NUMBER REF DWG 10

**NOTES**

- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E, TRAIN A.
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 100AF, 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
- ADJUSTABLE INSTANTANEOUS TRIP SET AT "LO".
- FOR SELECTIVE COORDINATION WITH THE SWITCHBOARD, DISTRIBUTION PANEL CIRCUIT BREAKER RATINGS MUST NOT EXCEED THE FOLLOWING:
  - 40AT FOR THERMAL MAGNETIC NON-ADJUSTABLE TRIP
  - 100AT FOR THERMAL MAGNETIC INSTANTANEOUS ADJUSTABLE TRIP
- DELETED.
- WIRING AND CABLING ENCLOSED WITHIN DASHED LINES  
----- IS ASSOCIATED CLASS 1E TRAIN AA.

**REFERENCE DRAWINGS**

- 1084H36 SH 28
- W-CV02821-F SH 1-13
- W-TC01702-D SH 1, 2
- W-TC04702-D SH 1, 2
- W-TC19702-D SH 1, 2
- W-TC22702-D SH 1, 2
- W-TC26825-D SH 1, 2
- W-TC07702-D SH 1, 2
- W-TC10702-D SH 1, 2
- 182-79225-3
- 09-500-76001 SH 8

DWG NO	REV	SH NO	REV
E2-0020	CP-2	B	CP-6

**TRAIN A**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEBMC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 CLASS III ASSOCIATED CIRCUITS

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

**125V DC**  
**ONE LINE DIAGRAM**

DRAWING CREATED ELECTRONICALLY

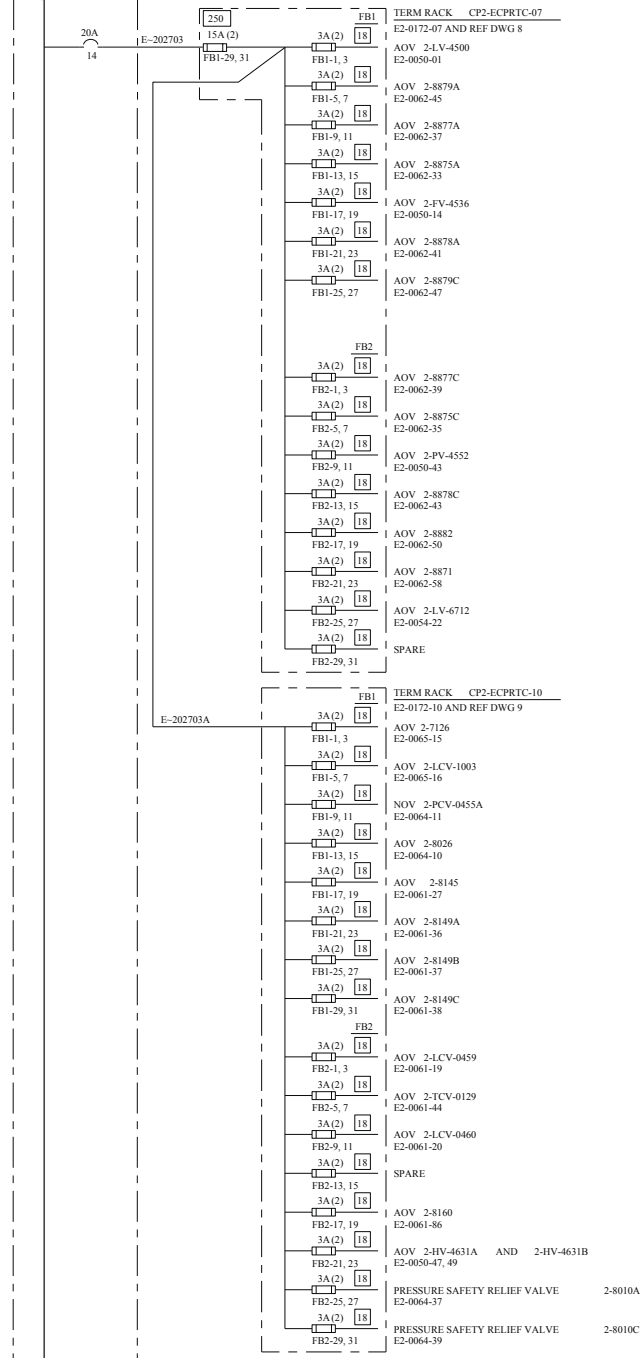
125V DC DISTRIBUTION PANEL

2ED1-1

CONT FROM DWG E2-0020-B LOC: F-6

CONT FROM THIS DWG  
LOC: A-5

CONT FROM  
THIS DWG  
LOC: C-6



CONT ON THIS DWG  
LOC: C-1

CONT TO  
LOC: E1  
THIS DWG

REV	DATE	BY	CHKD	APPD	REMARKS
CP-8	01-27-2006				THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-00181-02-00 PER 98-0001-04-00181-02-00 EDITORIAL CHANGE AS NOTED

FSAR FIGURE 8.3-14

- LEGEND
- 80A - CIRCUIT BREAKER
  - 80A - CIRCUIT BREAKER RATING
  - 1 - CIRCUIT NO
  - (2) - FUSE
  - FB1-1 - QUANTITY
  - FB1-1 - FUSE LOCATION MARKER
  - 18 - FUSE B/M ITEM NUMBER REF DWG 6

- NOTES
- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E TRAIN A UNLESS OTHERWISE NOTED.
  - ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 100AF, 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
  - DELETED.
  - FOR SELECTIVE COORDINATION WITH THE SWITCHBOARD, DISTRIBUTION PANEL CIRCUIT BREAKER RATINGS MUST NOT EXCEED THE FOLLOWING:  
40AT FOR TM, NON-ADJUSTABLE TRIP  
100AT FOR TM, INSTANTANEOUS ADJUSTABLE TRIP.
  - ALL WIRING AND CABLING ENCLOSED IN DASHED LINES IS ASSOCIATED CLASS 1E TRAIN AA.

- REFERENCE DRAWINGS
- W-TC13702-D SH 1, 2
  - W-TC16702-D SH 1, 2
  - W-TC28702-D SH 1, 2
  - 112P003 SH 1, 2
  - E2-0024-04
  - 182-79225-3

DRAWING	E2-0020	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0020		E2-0020-G	
E2-0020-A		E2-0020-H	
E2-0020-B		E2-0020-J	
E2-0020-C			
E2-0020-D			
E2-0020-E			
E2-0020-F			

TRAIN A  
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

TXU POWER  
CPSES  
GLEN ROSE, TEXAS

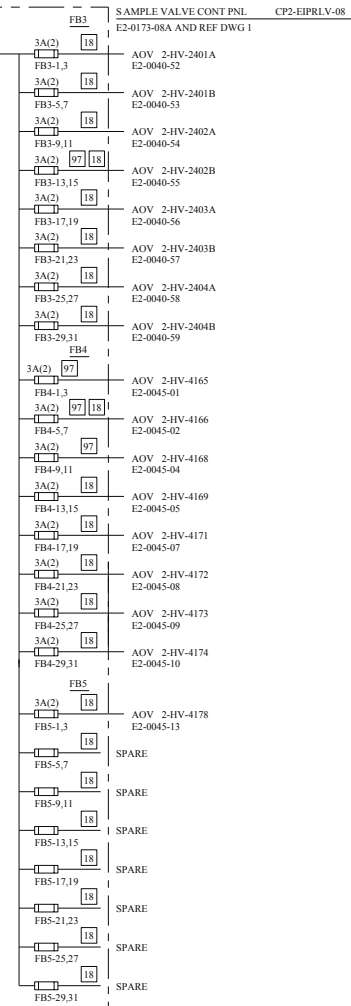
125V DC  
ONE LINE DIAGRAM

DWG NO	SH NO	REV
E2-0020	C	CP-8

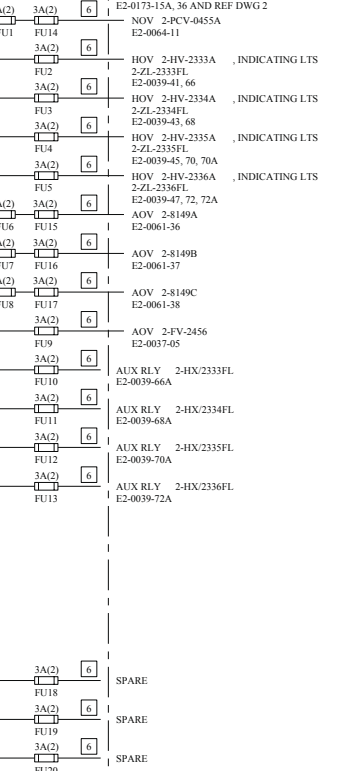


125V DC DISTRIBUTION PANEL  
CONT FROM DWG E2-0020-D LOC: E-6

2ED1-2

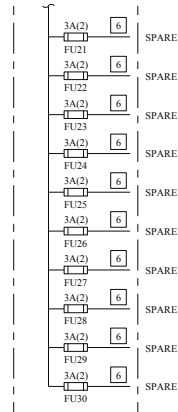


SHUTDOWN TRANSF PNL CP2-ECPRLV-15



CONT FROM THIS  
DWG LOC: A-6

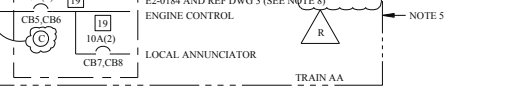
CONT FROM THIS  
DWG LOC: B-6



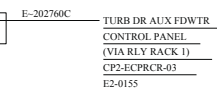
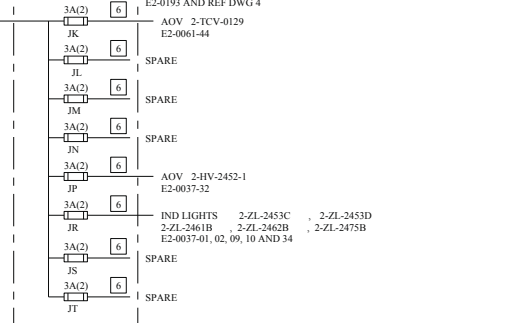
DG ENGINE CONT PNL 2-DG-01A (CHANNEL 1) CP2-MEDGEE-01A



DG ENGINE CONT PNL 2-DG-01A (CHANNEL 1) CP2-MEDGEE-01A



HOT SHUTDOWN PNL 2-LV-01 CP2-ECPRLV-01



TURB DR AUX FDWTR CONTROL PANEL (VIA RLY RACK 1) CP2-ECPRCR-03 E2-0155

CONT ON THIS DWG LOC: C-1

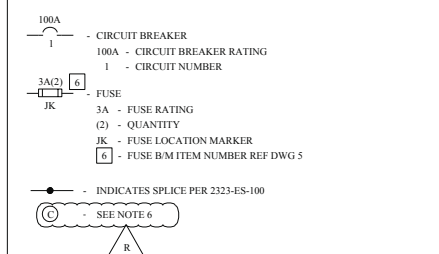
CONT ON THIS DWG LOC: D-1

+ Approved LDCRs

REV	DWN	CHK	APPV	REMARKS
CP-5	MM 03-19 2004	MM 03-20 2004		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE TDA 1999-02206-02-01 PER SK-0017-99-02206-02-00

FSAR FIGURE 8.3-14

LEGEND



NOTES

- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E, TRAIN AA UNLESS NOTED OTHERWISE.
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 100AF, 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
- DELETED.
- ALL WIRING AND CABLING ENCLOSED BY DASHED LINE IS ASSOCIATED CLASS 1E, TRAIN AA. THE FUNCTION OF THE LOAD IS NOT SAFETY RELATED AND THE LOAD CIRCUIT BREAKER IS CLASS 1E.
- ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO CIRCUIT BREAKERS, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER.
- THE CABLE BETWEEN THE TWO CIRCUIT BREAKERS PROVIDING ISOLATION FROM THE CLASS 1E BUS IS SAFETY RELATED, THOUGH TAGGED AS ASSOCIATED CLASS 1E.
- ALL INTERNALS, COMPONENTS AND WIRING SUPPLIED BY THE FEEDER CIRCUIT BREAKERS ARE NON-CLASS 1E, TRAIN C.

REFERENCE DRAWINGS

- W-LV08807-F SH 1, 2, 3
- W-2LV152861-F SH 1-6
- 09-500-76001 SH 1-8
- W-99X00404-F SH 1-14
- E2-0024-04(LATER)
- 182-79225-7

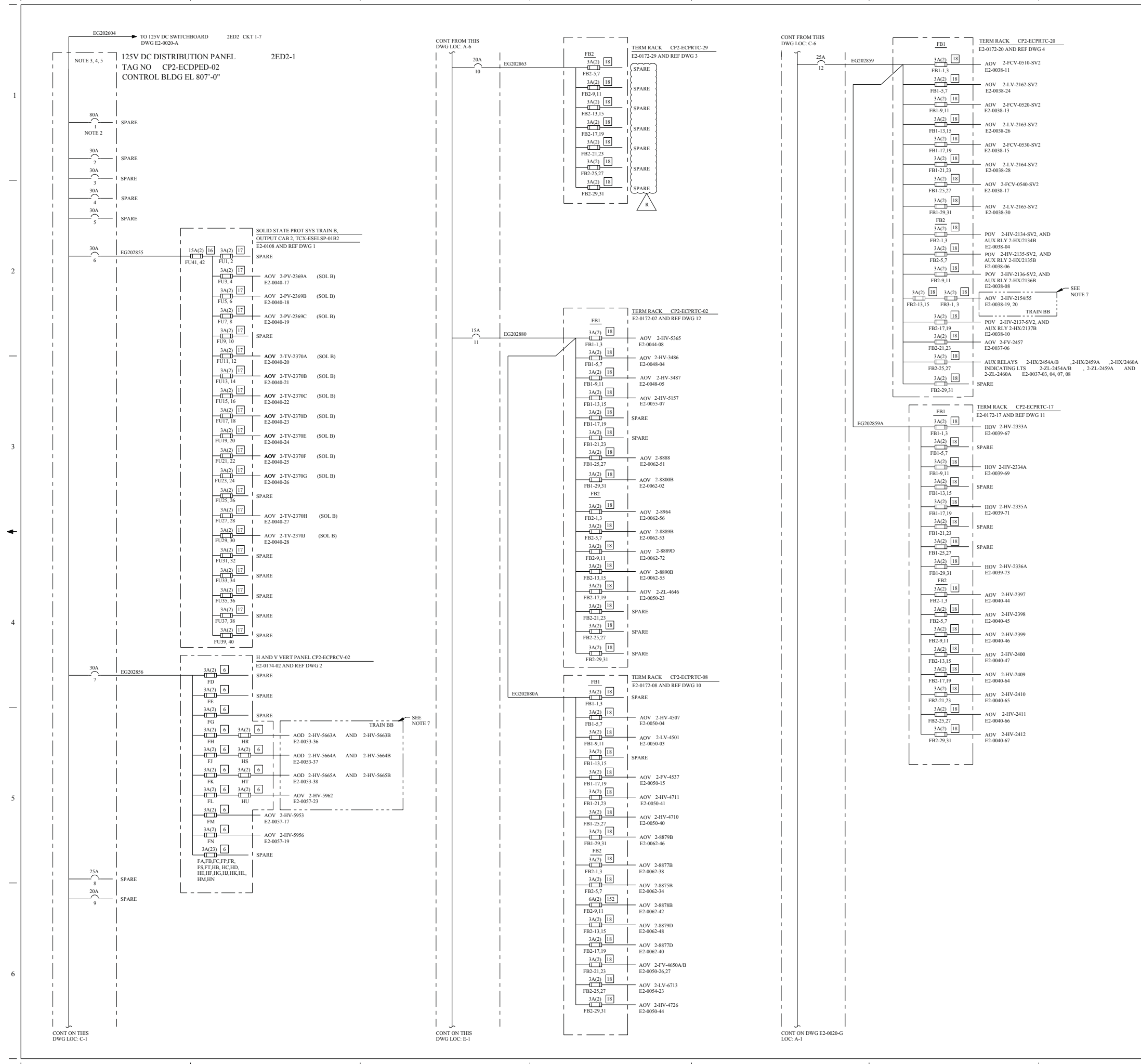
DRAWING	E2-0020	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0020	E2-0020-G		
E2-0020-A	E2-0020-H		
E2-0020-B	E2-0020-J		
E2-0020-C			
E2-0020-D			
E2-0020-E			
E2-0020-F			

TRAIN A  
CLASS I  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

TXU POWER  
CPSES  
GLEN ROSE, TEXAS

125V DC  
ONE LINE DIAGRAM

DWG NO. E2-0020	SH NO. E	REV. CP-5
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REV	DATE	BY	CHKD	APPD	REMARKS
7-10	06-11-2010	SK	SK	SK	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2010-000153-01-00 PDR SK-0001-10-000153-01-00

**FSAR FIGURE 8.3-14**

**LEGEND**

80A --- CIRCUIT BREAKER  
 80A --- CIRCUIT BREAKER RATING  
 1 --- CIRCUIT NUMBER  
 3A(2) --- FUSE  
 3A --- FUSE RATING  
 (2) --- QUANTITY  
 LK --- FUSE LOCATION MARKER  
 18 --- FUSE BM ITEM NUMBER, REF DWG 9

**NOTES**

- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E.
- INDICATES 225AF CIRCUIT BREAKER WITH ADJUSTABLE INSTANTANEOUS TRIP. FOR SETTING SEE REFERENCE DRAWING 8.
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- FOR SELECTIVE COORDINATION WITH THE SWITCHBOARD, DISTRIBUTION PANEL CIRCUIT BREAKER RATINGS MUST NOT EXCEED THE FOLLOWING:
  - 40AT FOR THERMAL MAGNETIC NON-ADJUSTABLE TRIP
  - 100AT FOR THERMAL MAGNETIC INSTANTANEOUS ADJUSTABLE TRIP
- EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
- DELETED.
- ALL WIRING AND CABLING ENCLOSED IN DASHED LINES IS ASSOCIATED CLASS 1E TRAIN BB.

**REFERENCE DRAWINGS**

- 271C366
- W-CV02821-F SH 1-3
- W-TC2970-D SH 1, 2
- W-TC2070-D SH 1, 2
- DELETED
- DELETED
- DELETED
- E2-2400-361
- E2-0024-04
- W-TC0870-D SH 1 AND 2
- W-TC1770-D SH 1 AND 2
- W-TC0270-D SH 1 AND 2
- 182-79225-4

DRAWING E2-0020	REV CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0020	E2-0020-E
E2-0020-A	E2-0020-F
E2-0020-B	E2-0020-G
E2-0020-C	E2-0020-H
E2-0020-D	E2-0020-I

**TRAIN B**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1	NERMIC CATEGORY I
SAFETY CLASS 2	ASSOCIATED CIRCUITS

**LUMINANT CPNPP**  
**GLEN ROSE, TEXAS**

**125VDC ONE LINE DIAGRAM**

DWG. NO. E2-0020	SHEET NO. F	REV. CP-10
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**FINAL PRINT**

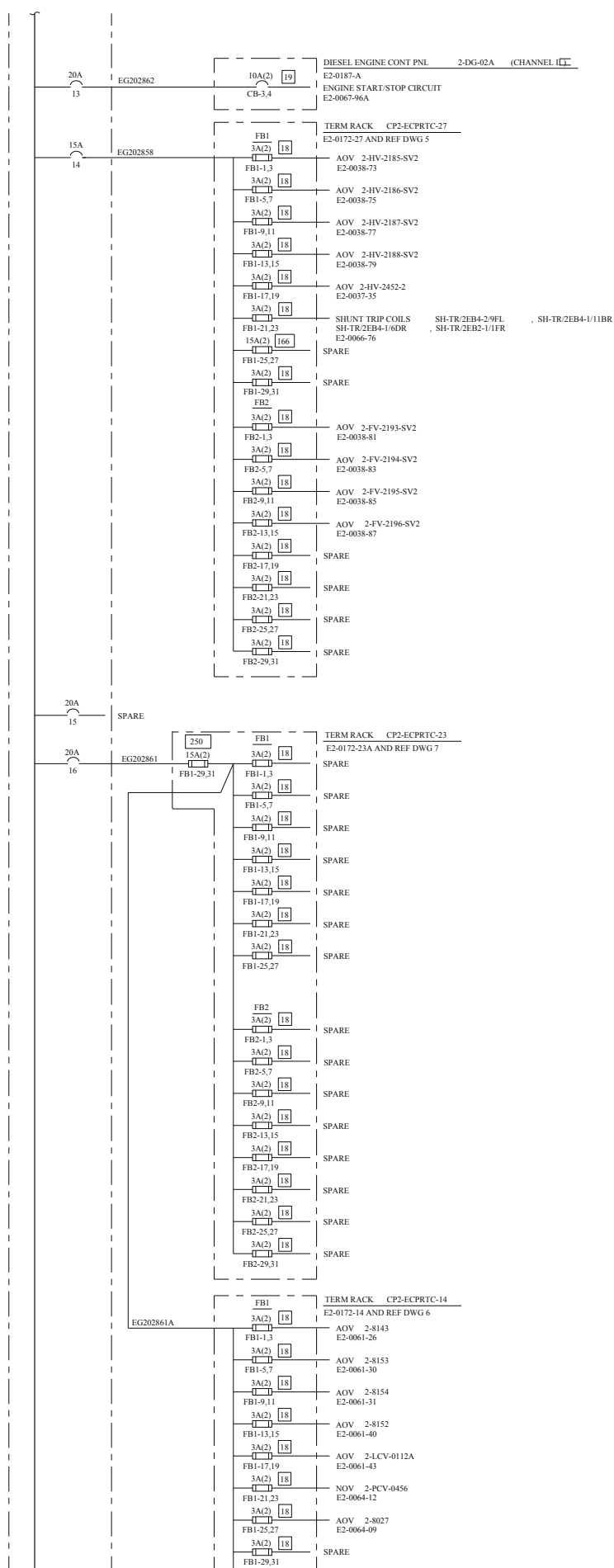
THIS DRAWING CREATED ELECTRONICALLY



125V DC DISTRIBUTION PANEL

2ED2-1

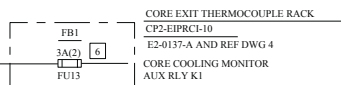
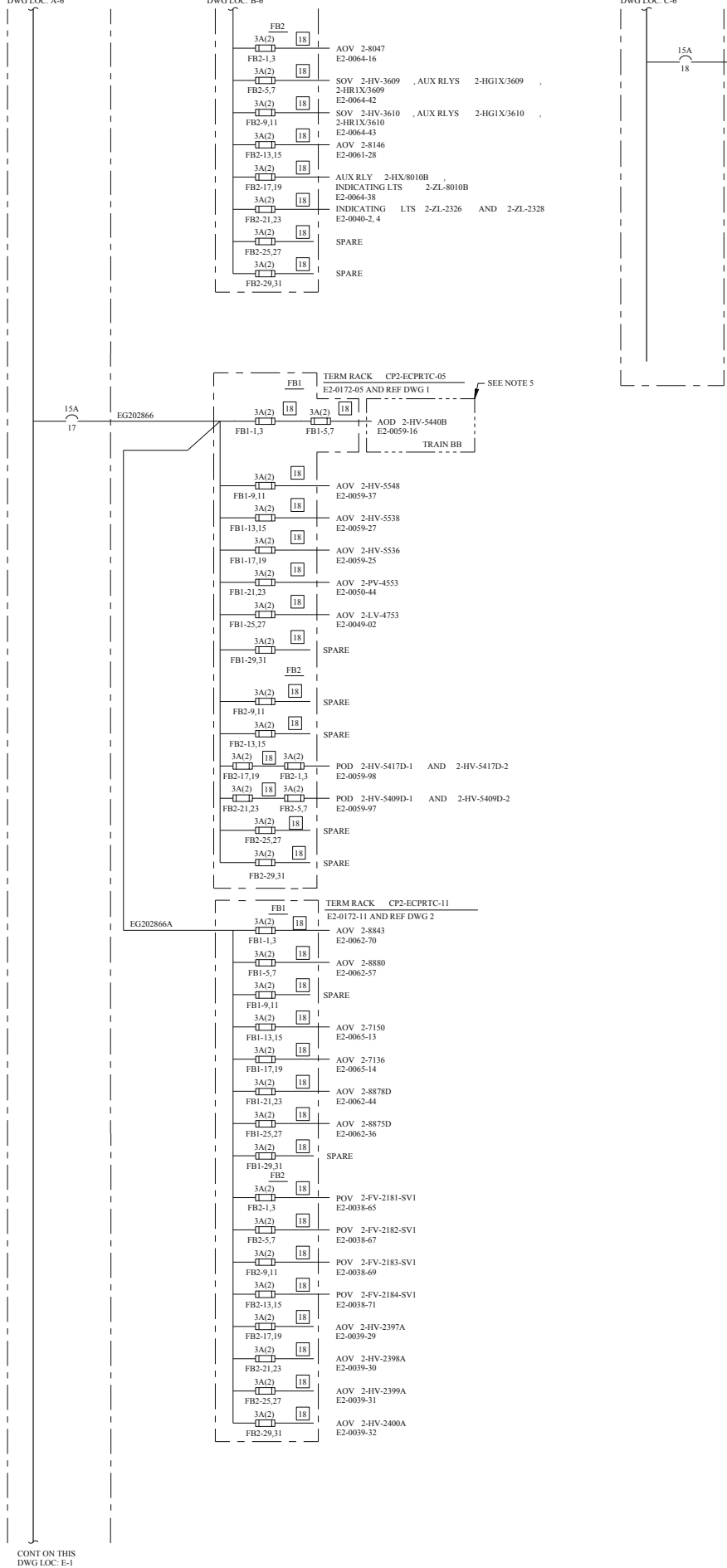
CONT FROM DWG E2-0020-F LOC E6



CONT FROM THIS DWG LOC: A-6

CONT FROM THIS DWG LOC: B-6

CONT FROM THIS DWG LOC: C-6



REV	DWN	CHKD	APVD	REMARKS
CP-7	10/27/2006	10/29/2006		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-00181-02-00 PER 98-001-04-00181-02-00 EDITORIAL CHANGE AS NOTED

**FSAR FIGURE 8.3-14**

**LEGEND**

- 80A - CIRCUIT BREAKER
- 80A - CIRCUIT BREAKER RATING
- 1 - CIRCUIT NO
- 3A(2) - FUSE
- 3A - FUSE RATING
- (2) - QUANTITY
- FB2-1 - FUSE LOCATION MARKER
- 18 - FUSE B/M ITEM NUMBER REF DWG 3

**NOTES**

- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E.
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
- DELETED.
- WIRING AND CABLING ENCLOSED WITHIN DASHED LINES IS ASSOCIATED CLASS 1E TRAIN BB.

**REFERENCE DRAWINGS**

- W-TC05702-D SH 1, 2
- W-TC1702-D SH 1, 2
- E2-0020-A
- 112D003 SH 1, 2
- W-2TC27825-D SH 1, 2
- W-TC14702-D SH 1, 2
- W-TC23702-D SH 1, 2

DRAWING E2-0020 REV CP-2

HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

E2-0020	E2-0020-E
E2-0020-A	E2-0020-F
E2-0020-B	E2-0020-G
E2-0020-C	E2-0020-H
E2-0020-D	E2-0020-J

**TRAIN B**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEMICATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**TXU POWER  
CPSES  
GLEN ROSE, TEXAS**

**125VDC  
ONE LINE DIAGRAM**

DWG NO. <b>E2-0020</b>	SH NO. <b>G</b>	REV. <b>CP-7</b>
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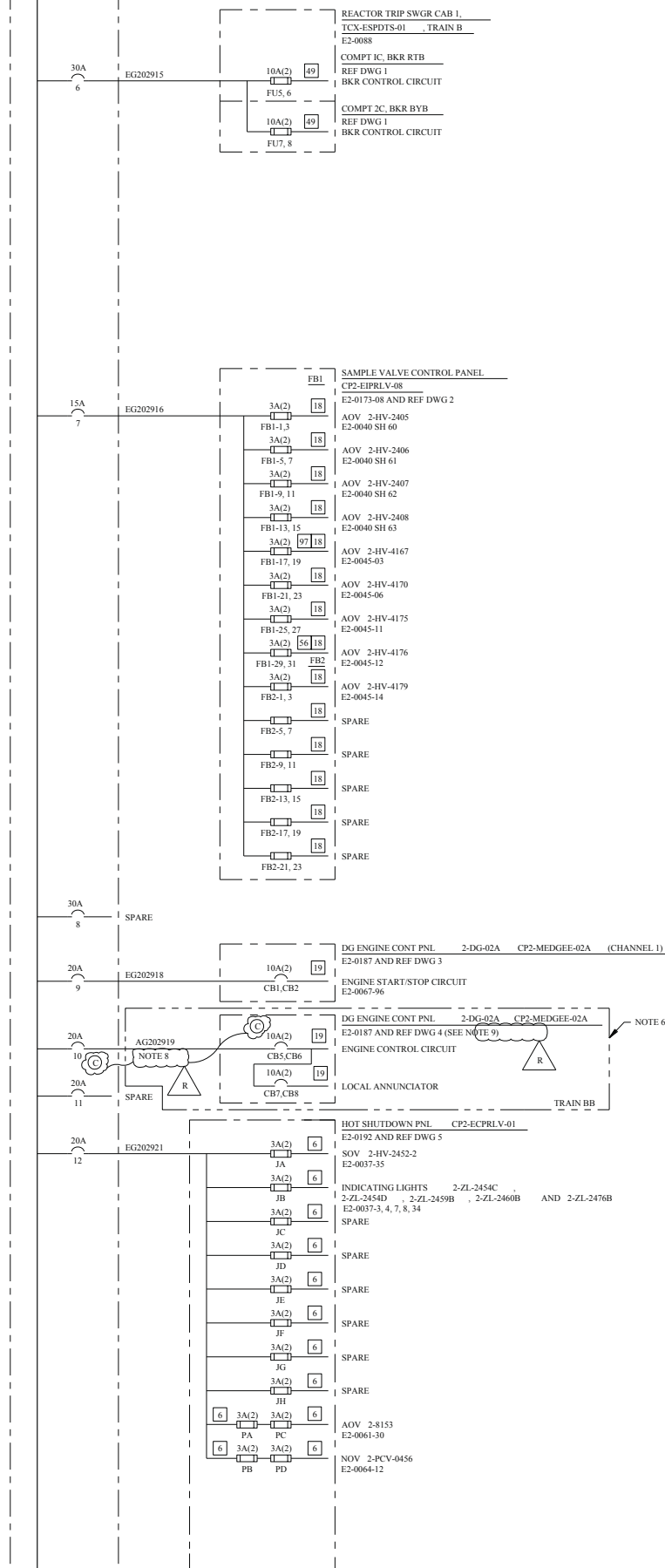
THIS DRAWING CREATED ELECTRONICALLY





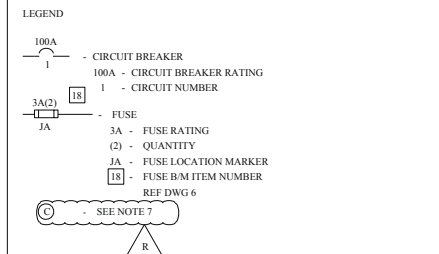
125V DC DISTRIBUTION PANEL  
CONT FROM DWG E2-0020-H LOC: E-6

2ED2-2



REV	DWN	CHK	APPV	REMARKS
CP-5	03-19-2004	03-20-2004		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE TXU-1999-02206-02-01 PER SK-0018-99-02206-02-01

FSAR FIGURE 8.3-14



- NOTES**
- ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DRAWING ARE CLASS 1E.
  - ALL CIRCUIT BREAKERS IN DISTRIBUTION PANELS ARE 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - FOR SELECTIVE COORDINATION WITH THE SWITCHBOARD, DISTRIBUTION PANEL CIRCUIT BREAKER RATINGS MUST NOT EXCEED THE FOLLOWING:
    - 40AT FOR THERMAL MAGNETIC NON-ADJUSTABLE TRIP
    - 100AT FOR THERMAL MAGNETIC INSTANTANEOUS ADJUSTABLE TRIP
  - EACH CIRCUIT BREAKER IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
  - DELETED.
  - ALL WIRING AND CABLING ENCLOSED BY DASHED LINE IS ASSOCIATED CLASS 1E, TRAIN BB. THE FUNCTION OF THE LOAD IS NOT SAFETY RELATED AND THE LOAD CIRCUIT BREAKER IS CLASS 1E.
  - ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO CIRCUIT BREAKERS, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER.
  - THE CABLE BETWEEN THE TWO CIRCUIT BREAKERS PROVIDING ISOLATION FROM THE CLASS 1E BUS IS SAFETY RELATED, THOUGH TAGGED AS ASSOCIATED CLASS 1E.
  - ALL INTERNALS, COMPONENTS AND WIRING SUPPLIED BY THE FEEDER CIRCUIT BREAKERS ARE NON-CLASS 1E, TRAIN C.

- REFERENCE DRAWINGS**
- 7026D76, 7026D77, 7026D78
  - W-1V08807-F SH 1, 2, 3
  - 09-500-76001 SH 8
  - 09-500-76001 SH 8
  - W-99X00404-F SH 1-14
  - E2-0024-04
  - 182-79225-8

DRAWING	E2-0020	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0020	E2-0020-E	E2-0020-A	E2-0020-F
E2-0020-B	E2-0020-G	E2-0020-C	E2-0020-H
E2-0020-D	E2-0020-J		

TRAIN B  
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

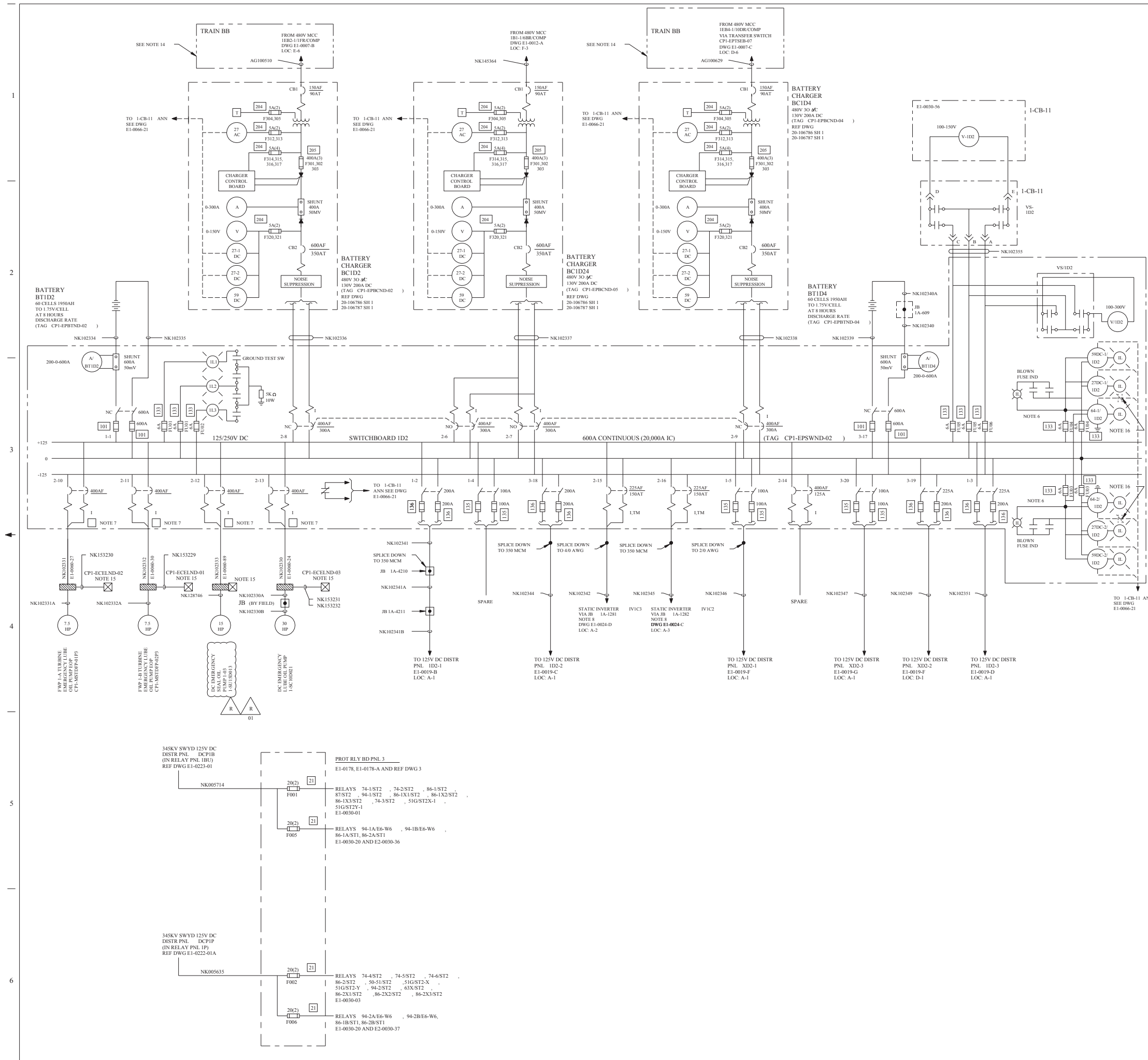
TXU POWER  
CPSES  
GLEN ROSE, TEXAS

125VDC  
ONE LINE DIAGRAM

DWG NO.	E2-0020	SH NO.	J	REV.	CP-5
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+ Approved LDCRs

THIS DRAWING CREATED ELECTRONICALLY



REV	DWN	CHK	APPV	REMARKS
CP-27	MM	MM	MM	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-00205-01-01 PER 98-0023-04-00205-01-01

**FSAR FIGURE 8.3-14A**

**LEGEND**

- MECHANICALLY INTERLOCKED BREAKERS
- ANNUNCIATOR
- THERMAL MAGNETIC
- MAIN CONTROL BOARD
- DC SWITCH BOARD
- SPLICE PER SPEC 2323-ES-100
- DC VOLTMETER
- UNDERVOLTAGE RELAY AC
- UNDERVOLTAGE RELAY DC
- DC AMMETER
- OVERVOLTAGE RELAY DC
- GROUND RELAY
- VOLTAGE REGULATOR
- EQUALIZING CHARGE TIMER
- LOCAL MOTOR STARTER
- SWITCHBOARD CIRCUIT BREAKER
- SWITCHBOARD SECTION 2, CIRCUIT BREAKER 10
- FRAME SIZE TRIP RATING
- ADJUSTABLE MAGNETIC TRIP SETTING
- INDICATING LIGHT (WHITE)
- FUSIBLE SWITCH
- FUSE B/M ITEM NUMBER REF DWG 2

**NOTES**

- ALL POWER FUSES ARE PROVIDED WITH CONTACTS FOR BLOWN FUSE INDICATION.
- DELETED
- INDICATES MAGNETIC (INST) TRIP ONLY.
- DELETED
- DELETED
- CONTACTS ARE FROM HUSSMANN KAZ ACTUATOR WITH TRIGGER FUSE.
- CIRCUIT BREAKER IS 4-POLE, 2-POLES ARE CONNECTED IN SERIES SUCH THAT EACH LINE TO LOAD CONNECTION IS MADE THROUGH 2 POLES.
- SWITCHBOARD CIRCUIT BREAKER SHALL BE INSTALLED IN FIELD.
- 225A FRAME AND LARGER SIZE BREAKERS HAVE AN INTERCHANGEABLE TRIP UNIT WITH ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP. FOR SETTING SEE REF DRAWING 1.
- DELETED
- DELETED
- ALL EQUIPMENT/DEVICES AND CABLES SHOWN ON THIS DRAWING ARE NON-CLASS I, UNLESS OTHERWISE NOTED.
- DELETED
- DELETED
- ALL CABLES INSIDE THESE DASHED LINES ARE ASSOCIATED CLASS I, TRAIN BB.
- INDICATES ADDED SHUNT AND 3A FUSES FOR MEASURING MOTOR CURRENT AND VOLTAGE RESPECTIVELY.
- N.O. CONTACT FROM GND DETECTION ANNUNCIATION DEFEAT SWITCH (SWITCH IS SHOWN IN DEFEAT POSITION)

**REFERENCE DRAWING**

- E1-2400-361
- E1-0024-04
- E-3813-03

DRAWING	E1-0019	REV	CP-5
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0019	E1-0019-A	E1-0019-B	E1-0019-C
E1-0019-C	E1-0019-D	E1-0019-E	

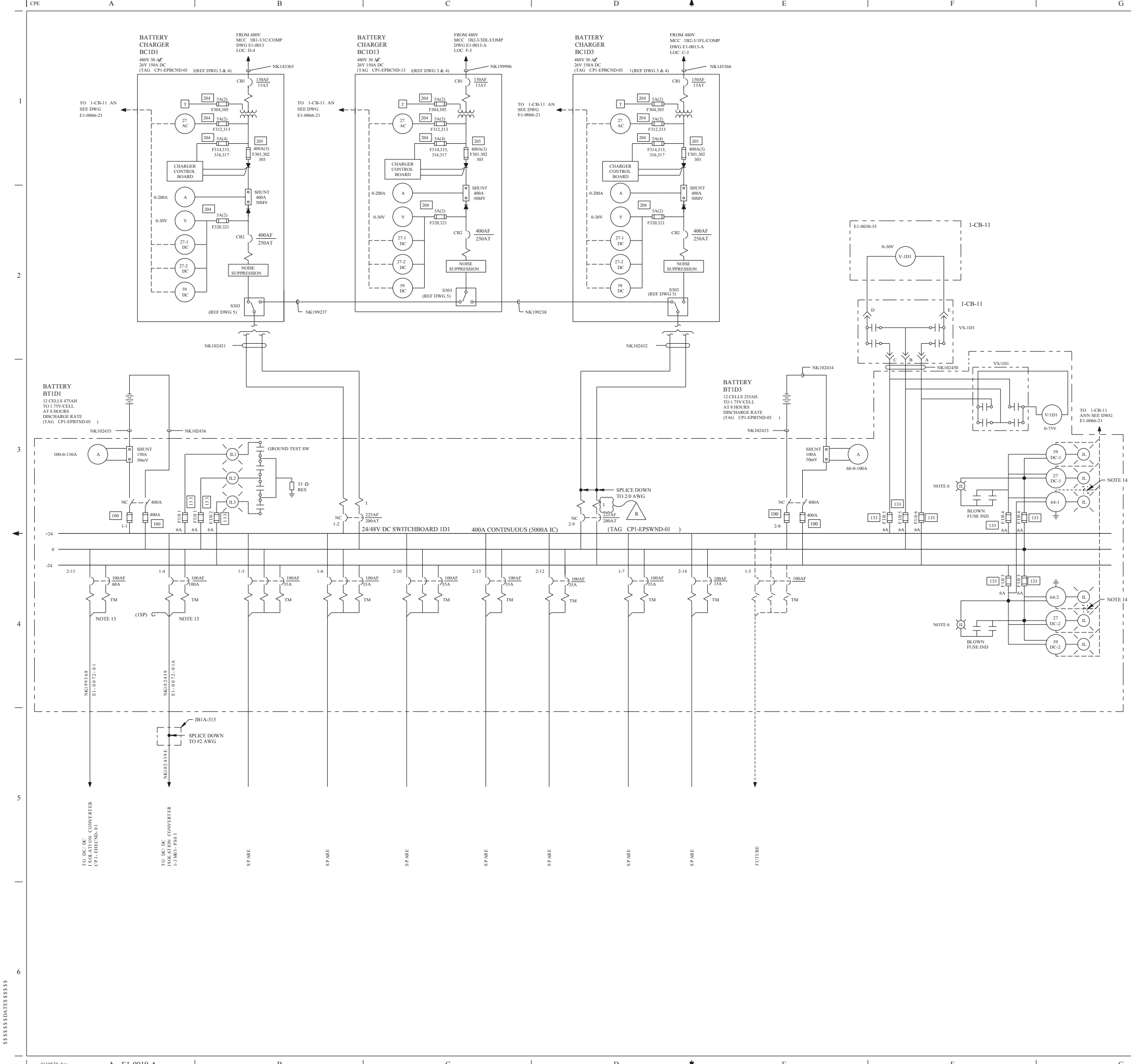
DRAWING	E1-0019	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0019	E1-0019-A		

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1    SERVIC CATEGORY    I  
SAFETY CLASS 2    SAFETY CLASS 3    ASSOCIATED CIRCUITS

**LUMINANT**  
CPSES  
GLEN ROSE, TEXAS

**125/250V DC SWITCHBOARD**  
ID2 ONE LINE DIAGRAM

DWG NO.	E1-0019	SH. NO.	-	REV.	CP-27
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REV	DATE	BY	CHKD	APPD	REMARKS
CP-16	06/17/2014	MI	06/17/2014	MI	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA:2014-000118-01-00 PER SR:0000-14-000118-01-00

**FSAR FIGURE 8.3-14A**

- LEGEND**
- MECHANICALLY INTERLOCKED BREAKERS
  - ANNUNCIATOR
  - THERMAL MAGNETIC
  - MAIN CONTROL BOARD
  - DC SWITCHBOARD
  - SPLICE
  - DC VOLTMETER
  - UNDERVOLTAGE RELAY, AC
  - UNDERVOLTAGE RELAY, DC
  - DC AMMETER
  - OVERVOLTAGE RELAY, DC
  - GROUND RELAY
  - EQUALIZING CHARGE TIMER
  - SWITCHBOARD CIRCUIT BREAKER
  - SWITCHBOARD SECTION 2, CIRCUIT BREAKER 10
  - FRAME SIZE CONTINUOUS RATING
  - INST MAGNETIC TRIP DEVICE SEE NOTE 4
  - INDICATING LIGHT (WHITE)
  - FUSIBLE SWITCH
  - FUSE BM ITEM NUMBER REF DWG 2

- NOTES**
1. ALL POWER FUSES ARE PROVIDED WITH CONTACTS FOR BLOWN FUSE INDICATION.
  2. ALL CIRCUIT BREAKERS ARE 2-POLE THERMAL MAGNETIC UNLESS OTHERWISE NOTED.
  3. INDICATES MAGNETIC (INST) TRIP ONLY.
  4. FOR INST MAGNETIC TRIP SETTING SEE REF DWG 1.
  5. DELETED
  6. CONTACTS ARE FROM BUSSMANN KAZ ACTUATOR WITH TRIGGER FUSE.
  7. CIRCUIT BREAKER IS 4-POLE, 2S POLES ARE CONNECTED IN SERIES SUCH THAT EACH LINE TO LOAD CONNECTION IS MADE THROUGH 2 POLES.
  8. SWITCHBOARD CIRCUIT BREAKER SHALL BE INSTALLED IN FIELD.
  9. DELETED
  10. INCOMING CIRCUIT BREAKERS ARE NON-AUTOMATIC (NO-TRIPS).
  11. DELETED
  12. ALL EQUIPMENT DEVICES AND CABLES SHOWN ON THIS DRAWING ARE NON-CLASS II, UNLESS OTHERWISE NOTED.
  13. METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 27AC/BC1D1, 64-I/1D1).
  14. N.O. CONTACT FROM GND DETECTION ANNUNCIATION DEFEAT SWITCH (SWITCH IS SHOWN IN DEFEAT POSITION)
  15. THIS IS A 3 POLE BREAKER WITH 2 POLES USED.

- REFERENCE DRAWINGS**
1. E1-2400-361
  2. E1-0024-04
  3. S1 DWG 20-106790 SH 1
  4. S1 DWG 20-106791 SH 1
  5. S1 DWG 20-105214 SH 1

- THE FOLLOWING CABLE(S) ARE SPARED IN SWITCHBOARD 1D1:
- |          |          |
|----------|----------|
| SP102440 | SP102444 |
| SP102441 | SP102445 |
| SP102442 | SP102446 |
| SP102443 |          |

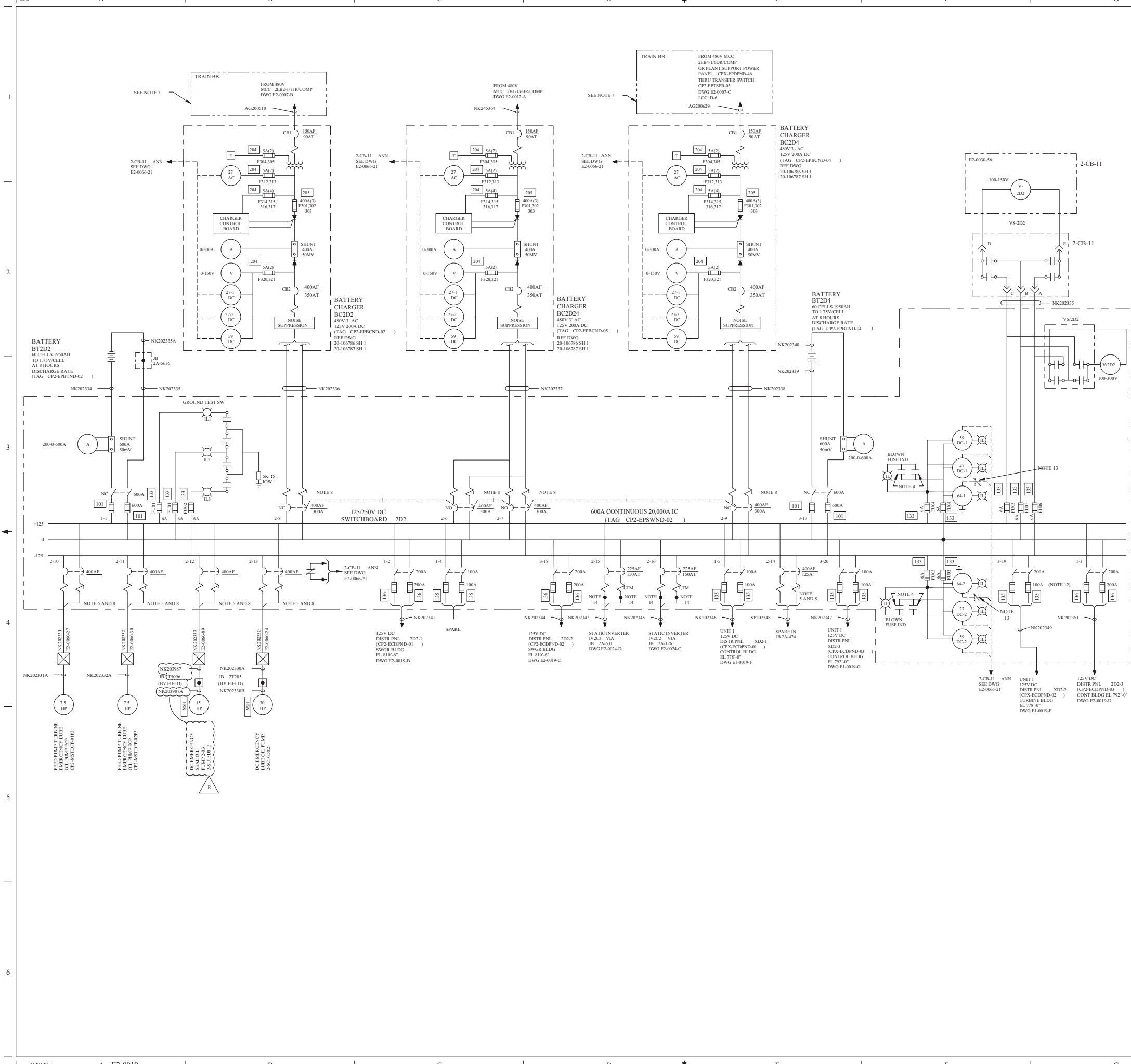
DRAWING NO.	2323-E1-0019	REV.	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0019			
E1-0019-A			

**NON-SAFETY**

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

24/48V DC  
ONE LINE DIAGRAM

DWG. NO.	E1-0019	SHEET	A	REV.	CP-16
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REV	CHKD	APVD	REMARKS
CP-18	MM	LSA	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-00255-06-00 PER SC-0024-04-00255-06-00

**FSAR FIGURE 8.3-14A**

**LEGEND:**

- MECHANICALLY INTERLOCKED BREAKERS
- ANN - ANNUNCIATOR
- TM - THERMAL-MAGNETIC
- CB - MAIN CONTROL BOARD
- SB - DC SWITCHBOARD
- - INDICATES SPLICE (SEE NOTE 11)
- DC VOLTMETER
- UNDERVOLTAGE RELAY AC
- UNDERVOLTAGE RELAY DC
- DC AMMETER
- OVERVOLTAGE RELAY DC
- VOLTAGE REGULATOR
- EQUALIZING CHARGE TIMER
- LOCAL MOTOR STARTER

**SWITCHBOARD CIRCUIT BREAKER**

- 2-10 - SWITCHBOARD SECTION 2, CIRCUIT BREAKER 10
- AF - FRAME SIZE
- AT - CONTINUOUS RATING
- I - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SETTING
- TM - THERMAL-MAGNETIC TRIP ELEMENT

**INDICATING LIGHT (WHITE)**

- FUSIBLE SWITCH
- DISCONNECT RATING
- FUSE B/M ITEM NUMBER REF DWG 1
- FUSE B/M ITEM NUMBER REF DWG 1
- FUSE LOCATION MARKER

**NOTES**

- ALL POWER FUSES ARE PROVIDED WITH CONTACTS FOR BLOWN FUSE INDICATION.
- ALL CIRCUIT BREAKERS ARE 2-POLE, THERMAL-MAGNETIC UNLESS OTHERWISE NOTED.
- POWER FUSES ARE BUSSMANN TYPE FRS (600V).
- CONTACTS ARE FROM BUSSMANN KAZ ACTUATOR WITH TRIGGER FUSE.
- CIRCUIT BREAKER IS 4-POLE, 2 POLES ARE CONNECTED IN SERIES SUCH THAT EACH LINE TO LOAD CONNECTION IS MADE THROUGH 2 POLES.
- ALL EQUIPMENT, DEVICES AND CABLES SHOWN ON THIS DRAWING ARE NON-CLASS 1E, UNLESS OTHERWISE NOTED.
- AL-GABLES INSIDE THESE DASHED LINES ARE ASSOCIATED CLASS 1E, TRAIN BB AS SHOWN.
- 225A FRAME AND LARGER SIZE BREAKERS HAVE AN INTERCHANGEABLE TRIP UNIT WITH ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP. FOR TRIP SETTING SEE REF DRAWING 2.
- SWITCHBOARD CIRCUIT BREAKER SHALL BE INSTALLED IN THE FIELD.
- METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN.
- THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 27AC/BC2D1, 64-1/2D1).
- FUSE REDUCERS REQUIRED - BUSSMANN PART NUMBER 2621-R.
- N.O. CONTACT FROM GND DETECTION ANNUNCIATOR DEFEAT SWITCH (SWITCH IS SHOWN IN DEFEAT POSITION).
- INDICATES TRANSITION SPLICE TO A 4/0 AWG CABLE PER 2323-ES-100.

**REFERENCE DRAWINGS**

- E2-0024-04
- E2-2090-361
- 182C79225 SH 1 AND 8A

DRAWING E2-0019	REV CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0019	
E2-0019-A	
E2-0019-B	
E2-0019-C	
E2-0019-D	

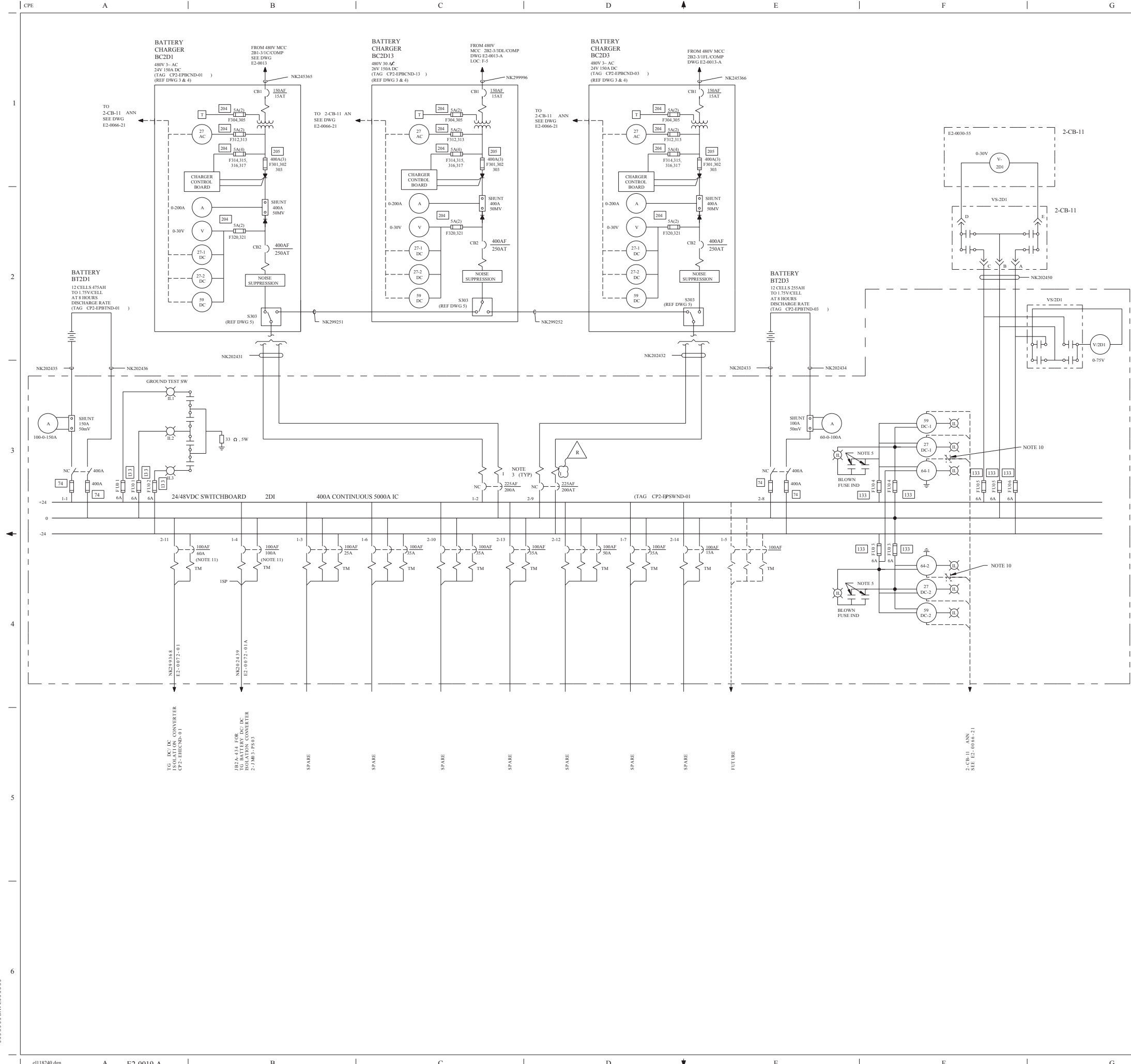
**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT  
CPSES  
GLEN ROSE, TEXAS**

**125/250V DC  
ONE LINE DIAGRAM**

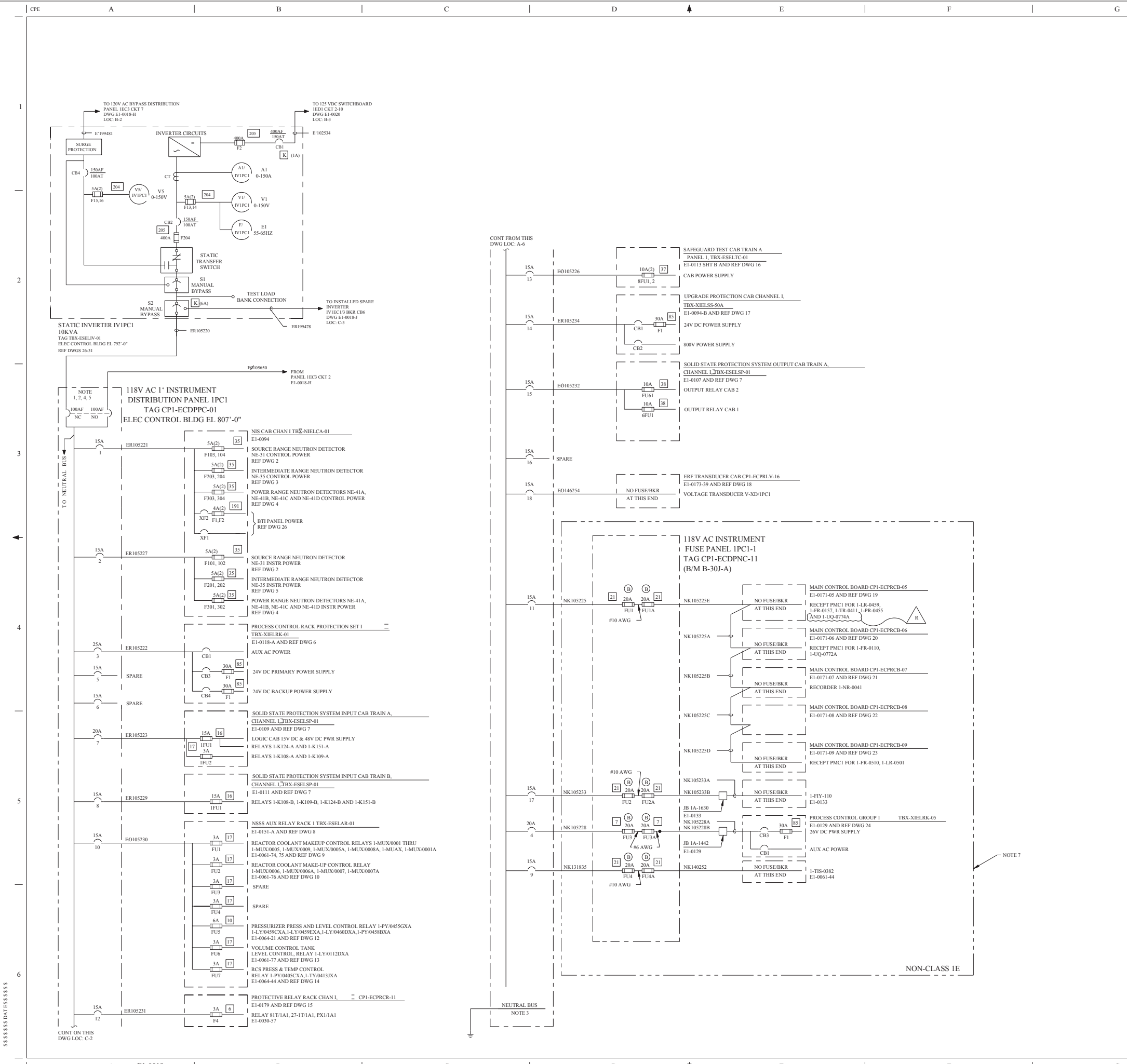
DWG. NO. E2-0019	SH. NO. -	REV. CP-18
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REV	DWN	CHK	APP	REMARKS										
CP-11	DL 06/17/2014	MH 06/17/2014	APV	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2014-000118-01-00 PFR SK-0094-14-000118-01-00										
<b>FSAR FIGURE 8.3-14A</b>														
LEGEND:														
<ul style="list-style-type: none"> <li> - MECHANICALLY INTERLOCKED BREAKERS</li> <li>ANN - ANNUNCIATOR</li> <li>TM - THERMAL MAGNETIC</li> <li>CB - MAIN CONTROL BOARD</li> <li>SB - DC SWITCHBOARD</li> <li>V - DC VOLTMETER</li> <li>27 AC - UNDERVOLTAGE RELAY AC</li> <li>27 DC - UNDERVOLTAGE RELAY DC</li> <li>A - DC AMMETER</li> <li>59 DC - OVERVOLTAGE RELAY DC</li> <li>64 - GROUND RELAY</li> <li>T - EQUALIZING CHARGE TIMER</li> <li>SWITCHBOARD CIRCUIT BREAKER</li> <li>2-10 - SWITCHBOARD SECTION 2, CIRCUIT BREAKER 10</li> <li>AF - FRAME SIZE</li> <li>A - CONTINUOUS RATING</li> <li>1 - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP SETTING SEE NOTE 3</li> <li>IL - INDICATING LIGHT (WHITE)</li> <li>400A - DISCONNECT RATING</li> <li>400A - FUSIBLE RATING</li> <li>74 - FUSIBLE SWITCH</li> <li>74 - FUSE BM ITEM NUMBER REF DWG 1</li> <li>133 - FUSE 6A RATING</li> <li>133 - FUSE BM ITEM NUMBER REF DWG 1</li> <li>FUS - LOCATION MARKER</li> </ul>														
NOTES														
<ol style="list-style-type: none"> <li>1. ALL POWER FUSES ARE PROVIDED WITH CONTACTS FOR BLOWN FUSE INDICATION.</li> <li>2. ALL CIRCUIT BREAKERS ARE 2-POLE, THERMAL MAGNETIC UNLESS OTHERWISE NOTED.</li> <li>3. 225A FRAME AND LARGER FRAME SIZE BREAKERS HAVE INTERCHANGEABLE TRIP UNIT WITH ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP. FOR SETTING SEE REF DWG 2.</li> <li>4. POWER FUSES ARE BUSSMANN TYPE FR8 (600V).</li> <li>5. CONTACTS ARE FROM BUSSMANN KAZ ACTUATOR WITH TRIGGER FUSE.</li> <li>6. ALL EQUIPMENT DEVICES AND CABLES SHOWN ON THIS DRAWING ARE NON-CLASS IIE, UNLESS OTHERWISE NOTED.</li> <li>7. METER RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 27AC/BC2D1, 64-1/2D1).</li> <li>8. INCOMING CIRCUIT BREAKERS ARE NON-AUTOMATIC (NO-TRIPS).</li> <li>9. SWITCHBOARD CIRCUIT BREAKER SHALL BE INSTALLED IN FIELD.</li> <li>10. N.O. CONTACT FROM GND DETECTION ANNUNCIATOR DEFEAT SWITCH (SWITCH IS SHOWN IN DEFEAT POSITION).</li> <li>11. THIS IS A 3-POLE BREAKER WITH 2-POLES USED.</li> </ol>														
REFERENCE DRAWINGS														
<ol style="list-style-type: none"> <li>1. E2-0024-04</li> <li>2. E2-2400-361</li> <li>3. SCT DWG 20-106790 SH 1</li> <li>4. SCT DWG 20-106791 SH 1</li> <li>5. SCT DWG 20-105214 SH 1</li> </ol>														
THE FOLLOWING CABLE(S) ARE SPARED IN SWITCHBOARD 2D1:														
JB 2A-439		JB 2A-435												
SP202443		SP202445												
JB 2A-438		JB 2T-277												
SP202444		SP202446												
DRAWING E2-0019 REV CP-2 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">E2-0019</td> <td style="width: 50%;">E2-0019-E</td> </tr> <tr> <td>E2-0019-A</td> <td></td> </tr> <tr> <td>E2-0019-B</td> <td></td> </tr> <tr> <td>E2-0019-C</td> <td></td> </tr> <tr> <td>E2-0019-D</td> <td></td> </tr> </table>					E2-0019	E2-0019-E	E2-0019-A		E2-0019-B		E2-0019-C		E2-0019-D	
E2-0019	E2-0019-E													
E2-0019-A														
E2-0019-B														
E2-0019-C														
E2-0019-D														
<b>NON-SAFETY</b>														
LUMINANT CPNPP GLEN ROSE, TEXAS														
24/48V DC ONE LINE DIAGRAM														
DWG NO. E2-0019	SH. NO. A	REV. CP-11												

\$\$\$\$\$DATE\$\$\$\$\$

THIS DRAWING CREATED ELECTRONICALLY



REV	DWN	CHKD	APVD	REMARKS
CP-24	12/20/2014	SM	12/20/2014	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FROM 2014-000172-79-00 PER SC-0001-10-000172-79-00 EDITORIAL CHANGE AS NOTED

FSAR FIGURE 8.3-15

**LEGEND**

- MANUAL TRANSFER SWITCH
- CIRCUIT BREAKER  
15A - CIRCUIT BREAKER RATING  
1 - CIRCUIT NUMBER
- FUSE  
5A(2) - 5A - FUSE RATING  
(2) - QUANTITY  
F103 - FUSE LOCATION MARKER  
35 - FUSE B/M ITEM NUMBER REF DWG 25
- VOLTMETER
- AMMETER
- FREQUENCY METER
- KIRK KEY INTERLOCK  
(1A) - LOCK NUMBER
- MANUAL BYPASS SWITCH  
MAKE BEFORE BREAK, 2 POSITION
- INDICATES SPICE  
(SPLICE PER SPEC ES-100)
- SEE NOTE 8

**NOTES**

1. BREAKERS 1PC100BKR-1 AND -2 USED FOR MANUAL TRANSFER SWITCH IS NON-AUTOMATIC (NO TRIPS).
2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
3. VERTICAL NEUTRAL BUS.
4. ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1-NO AND 1-NC CONTACT. FOR SSI SCHEMATICS SEE E1-0071 SERIES DRAWINGS.
5. THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES. SEE DBD-EE-043 FOR DETAILS.
6. DELETED
7. - - - - - EQUIPMENT AND CABLES ENCLOSED BY DASHED LINES ARE NON-CLASS 1E.
8. THE ISOLATION BETWEEN THE CLASS 1E SOURCE AND THE NON-CLASS 1E LOAD IS PROVIDED BY TWO FUSES IN SERIES INDICATED (X) TO THE ISOLATION DEVICE. THE USE OF NON-CLASS 1E FUSES AND THE ACCEPTABILITY OF PROVIDING ISOLATION AFTER THE NON-CLASS 1E CABLE IS DOCUMENTED IN DBD-EE-057 ATTACH 20 SEC 3.10.1.

**REFERENCE DRAWINGS**

1. DELETED
2. 6094D63 SH 1
3. 6089D33 SH 3
4. 6065D99 SH 3
5. 6089D33 SH 1
6. 8760D65 SH 2 AND 8810D55
7. 1084H36 SH 30 (TRAIN A) AND SH 30A (TRAIN B)
8. 1196E96 SH 1, 2, 3, 4
9. 271C336 SH 115
10. 271C336 SH 116
11. DELETED
12. 271C336 SH 125
13. 271C336 SH 126
14. 271C336 SH 130
15. E-3814E
16. 9555D15 SH 4
17. 8833D42 SH 1, 2 AND 8833D28 SH 1
18. E-6604
19. W-CB05701-F SH 1, 2, 5
20. W-CB06701 SH 1, 3
21. W-CB07701-F SH 1, 3
22. W-CB08701-F SH 6
23. W-CB09701-F SH 1, 2, 5
24. 8760D65 SH 6 AND 8810D59
25. E1-0024-04
26. 4D04921
27. 10-102723 SH 1
28. 10-102724 SH 1
29. 20-103521 SH 1, 2
30. 20-103522 SH 1
31. 20-103523 SH 1

DRAWING E1-0018	REV CP-6
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0018	E1-0018-E
E1-0018-A	E1-0018-F
E1-0018-B	E1-0018-G
E1-0018-C	E1-0018-H
E1-0018-D	

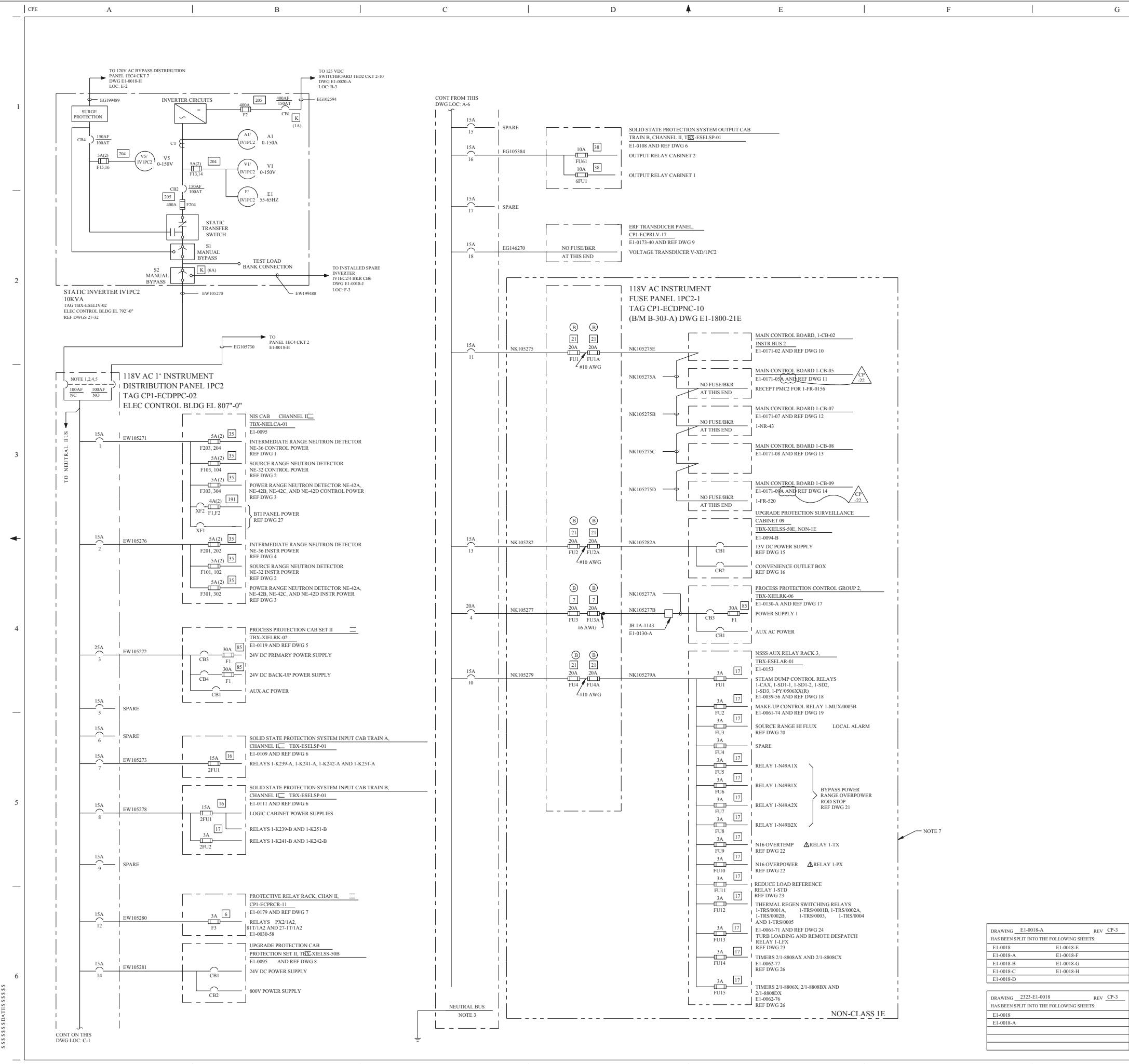
CLASS I  
(NUCLEAR SAFETY-RELATED)

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

118V AC  
INSTRUMENT BUS DISTRIBUTION  
ONE LINE DIAGRAM

DWG. NO. E1-0018	SH. NO. - REV. CP-24
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REV	DWN	CHK	APPV	REMARKS
7/22	SH 2011			THIS DRAWING REVISED TO INCORPORATE EDITORIAL CHANGES AS NOTED PER A/CB-2011-00706-1.

**FSAR FIGURE 8.3-15**

**LEGEND**

- MANUAL TRANSFER SWITCH
- CIRCUIT BREAKER
- 15A - CIRCUIT BREAKER RATING
- 1 - CIRCUIT NUMBER
- FUSE
- 5A(2) - FUSE RATING
- (2) - QUANTITY
- F203 - FUSE LOCATION MARKER
- 55 - FUSE B/M ITEM NUMBER REF DWG 25
- VOLTMETER
- AMMETER
- FREQUENCY METER
- KIRK KEY INTERLOCK (1A) - LOCK NUMBER
- MANUAL BYPASS SWITCH MAKE BEFORE BREAK, 2 POSITION
- INDICATES SPLICE (SPLICE PER SPEC ES-100)
- SEE NOTE 11

**NOTES**

- MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- VERTICAL NEUTRAL BUS.
- ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1-NO AND 1-NC CONTACT. FOR SSI SCHEMATICS SEE E1-0071 SERIES DRAWINGS.
- THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES. SEE DBD-EE-043 FOR DETAILS.
- DELETED
- EQUIPMENT AND CABLES ENCLOSED BY DASHED LINES ARE NON-CLASS 1E.
- DELETED
- BUSSMAN NON-20
- METER/RELAY TAG NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 2AM/IVIPC2).
- THE ISOLATION BETWEEN THE CLASS 1E SOURCE AND THE NON-CLASS 1E LOAD IS PROVIDED BY TWO FUSES IN SERIES INDICATED (B) TO THE ISOLATION DEVICE. THE USE OF NON-CLASS 1E FUSES AND THE ACCEPTABILITY OF PROVIDING ISOLATION AFTER THE NON-CLASS 1E CABLE IS DOCUMENTED IN DBD-EE-057 ATTACH 20 SEC 3.10.1.

**REFERENCE DRAWINGS**

- 6089D33 SH 3
- 6094D63 SH 1
- 6065D99 SH 3
- 6089D33 SH 1
- 8810D56
- 1084H36 SH 30
- E-3814E
- 8833D43 SH 01, 8833D29 SH 1
- E-6603, E-6606
- W-CB02701-F SH 02, 05
- W-CB05701-F SH 02, 05
- W-CB07701-F SH 01, 01A, 03
- W-CB08701-F SH 01-07
- W-CB09701-F SH 02, 05
- 8833D28 SH 1
- 8833D42, 8833D43
- 8760D65 SH 7
- 271C336 SH 110
- 271C336 SH 114
- 271C336 SH 118
- 271C336 SH 120
- 271C336 SH 122
- 271C336 SH 123
- 271C336 SH 127
- E1-0024-04
- 1196E96 SH 10
- 4D04921
- 10-102723 SH 1
- 10-102724 SH 1
- 20-103251 SH 1, 2
- 20-103252 SH 1
- 20-103253 SH 1

**CHANNEL 1E**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1      SUBMIT CATEGORY      I  
SAFETY CLASS 2      CLASS 1E  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

**118V AC INSTRUMENT BUS DISTRIBUTION ONE LINE DIAGRAM**

DRAWING E1-0018-A	REV CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0018	E1-0018-E
E1-0018-A	E1-0018-F
E1-0018-B	E1-0018-G
E1-0018-C	E1-0018-H
E1-0018-D	

DRAWING 2323-E1-0018	REV CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0018	
E1-0018-A	

DWG NO: E1-0018      SH NO: A      REV: CP-22

**< FINAL PRINT >**

REV	DWN	CHKD	APPD	REMARKS
7-16	DL	TEAC		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE EIA-2010-00023-01-00 PER 96-001-10-00023-01-00 EDITORIAL CHANGE AS NOTED.

FSAR FIGURE 8.3-15

- LEGEND
- MANUAL TRANSFER SWITCH
  - CIRCUIT BREAKER  
15A - CIRCUIT BREAKER RATING  
1 - CIRCUIT NUMBER
  - FUSE  
5A(2) - FUSE RATING  
(2) - QUANTITY  
F303 - FUSE LOCATION MARKER  
35 - FUSE B/M ITEM NUMBER REF DWG 12
  - VOLTMETER
  - AMMETER
  - FREQUENCY METER
  - KIBK KEY INTERLOCK  
(2A) - LOCK NUMBER
  - MANUAL BYPASS SWITCH  
MAKE BEFORE BREAK, 2 POSITION
  - INDICATES SPLICE PER SPEC 2323-ES-100
  - SEE NOTE 11

- NOTES
1. BREAKERS 1PC30/BKR-1 AND 1PC30/BKR-2 USED FOR MANUAL TRANSFER SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. VERTICAL NEUTRAL BUS.
  4. ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1-NO AND 1-NC CONTACT. FOR SSI SCHEMATICS SEE EI-0071 SERIES DRAWINGS.
  5. THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES. SEE DBD-EE-043 FOR DETAILS.
  6. DELETED
  7. - - - - - EQUIPMENT AND CABLES ENCLOSED BY DASHED LINES ARE NON-CLASS 1E.
  8. FUSES FU1, IA, 2, 2A, 4 AND 4A ARE GOULD SHAWMUT TYPE A25X20. FUSES FU3 AND 3A ARE BUSSMANN TYPE NON-20.
  9. DELETED
  10. METER/RELAY TAG NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 1AM/VIP3).
  11. THE ISOLATION BETWEEN THE CLASS 1E SOURCE AND THE NON-CLASS 1E LOAD IS PROVIDED BY TWO FUSES IN SERIES INDICATED TO THE ISOLATION DEVICE. THE USE OF NON-CLASS 1E FUSES AND THE ACCEPTABILITY OF PROVIDING ISOLATION AFTER THE NON-CLASS 1E CABLE IS DOCUMENTED IN DBD-EE-057 ATTACH 20 SEC 3.10.1.

- REFERENCE DRAWINGS
1. 6065D99 SH 3
  2. 8760D65 SH 4 AND 8810D57
  3. 1084H36 SH 30
  4. E-3814E
  5. 8833D42 SH 1, 2 AND 8833D28 SH 1
  6. E-6604
  7. W-CB09701-F SH 1, 2, 5
  8. W-CB07701-F SH 1, 3
  9. W-CB05701-F SH 2, 5
  10. W-CB04701-F SH 1, 3
  11. 8760D65 SH 8 AND 8810D61
  12. EI-0024-04
  13. 4D04921
  14. 10-102723 SH 1
  15. 10-102724 SH 1
  16. 20-103521 SH 1, 2
  17. 20-103522 SH 1
  18. 20-103523 SH 1

DRAWING	EI-0018-B	REV	CP-1
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
EI-0018-B			
EI-0018-C			

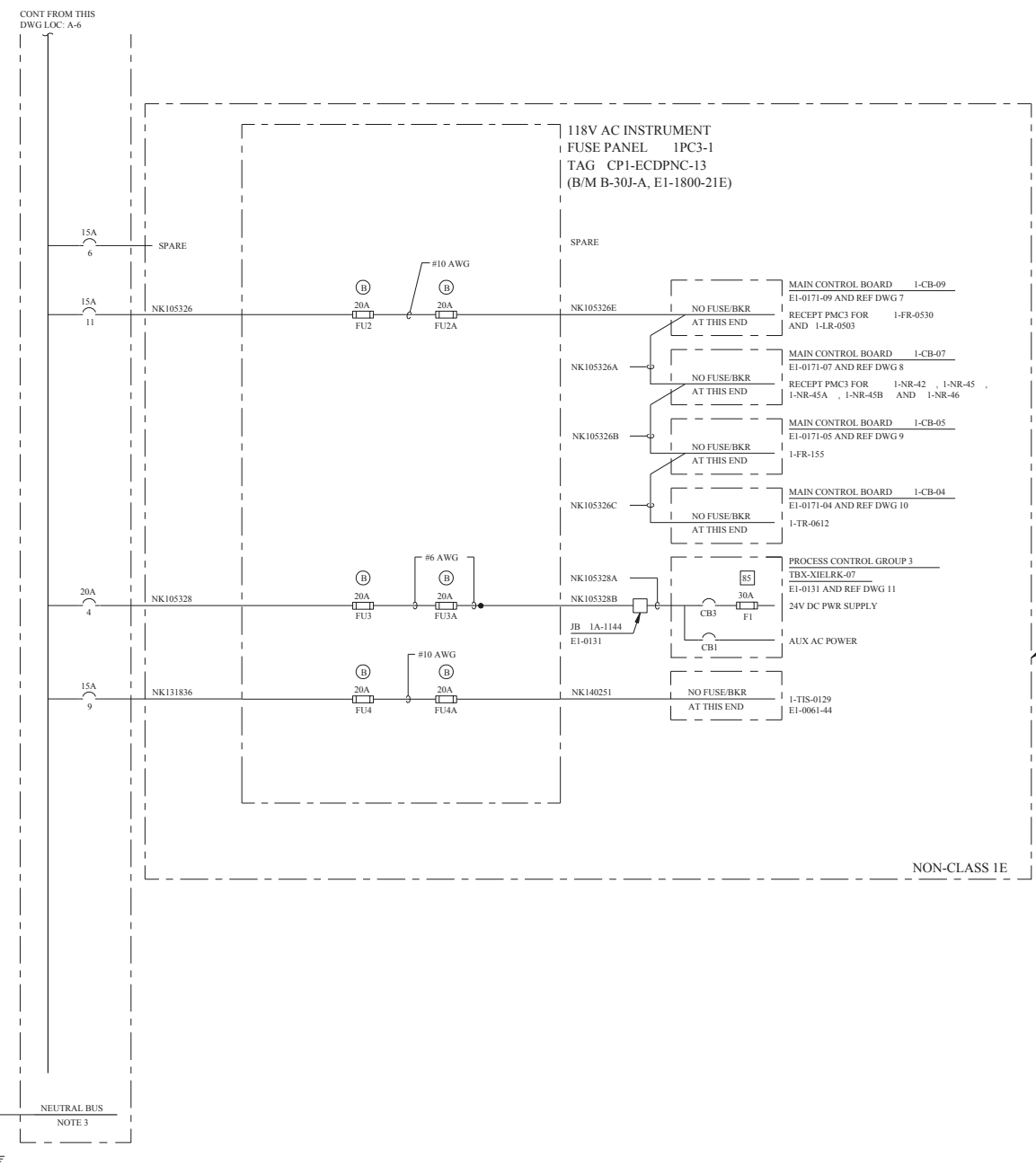
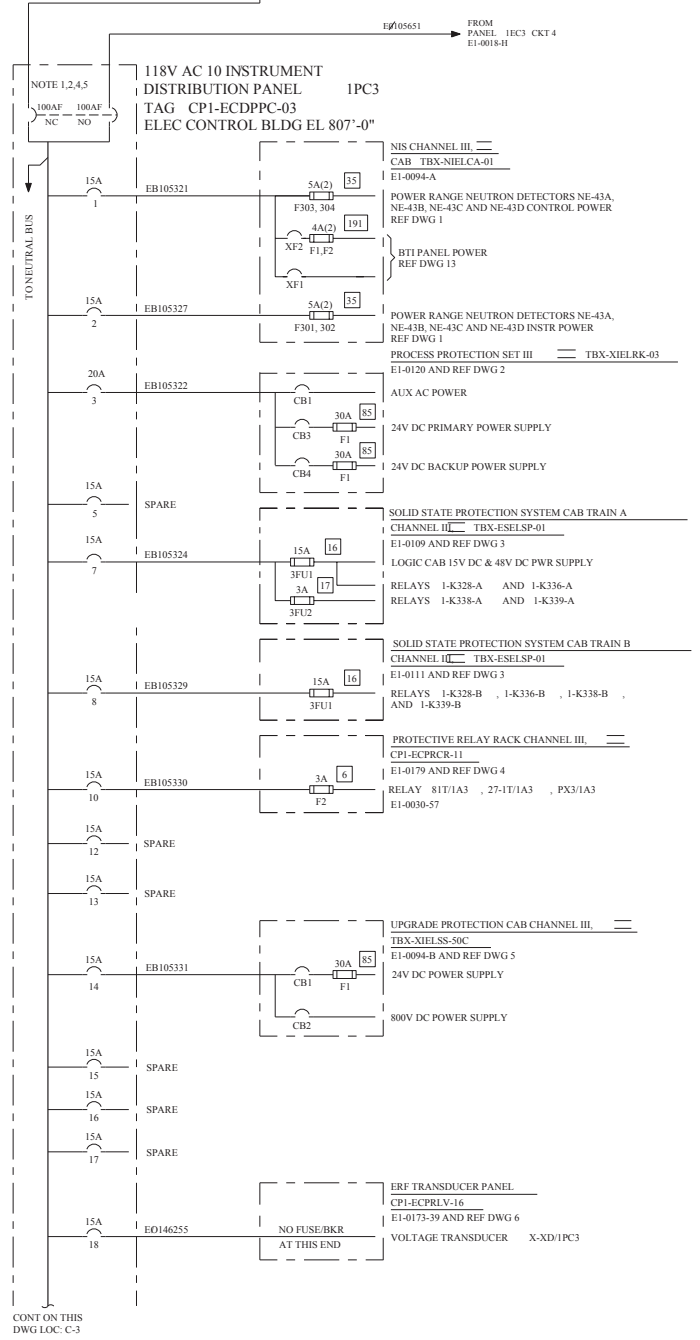
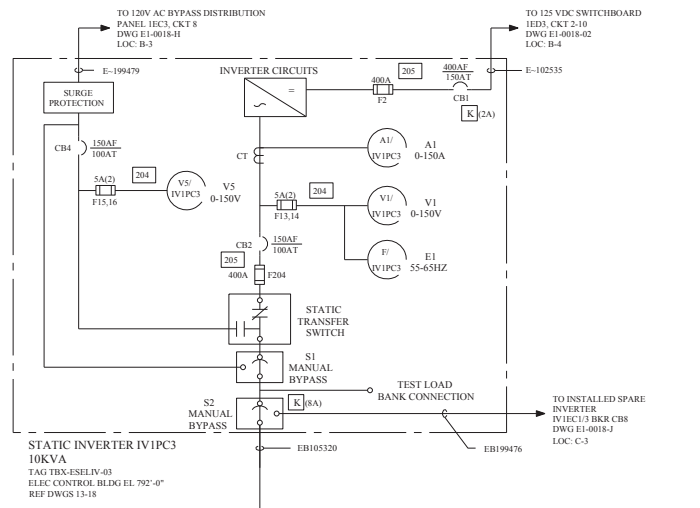
DRAWING	EI-0018	REV	CP-5
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
EI-0018			
EI-0018-B			

CHANNEL III  
CLASS I  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1      SERVIC CATEGORY I  
SAFETY CLASS 2      CLASS II  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

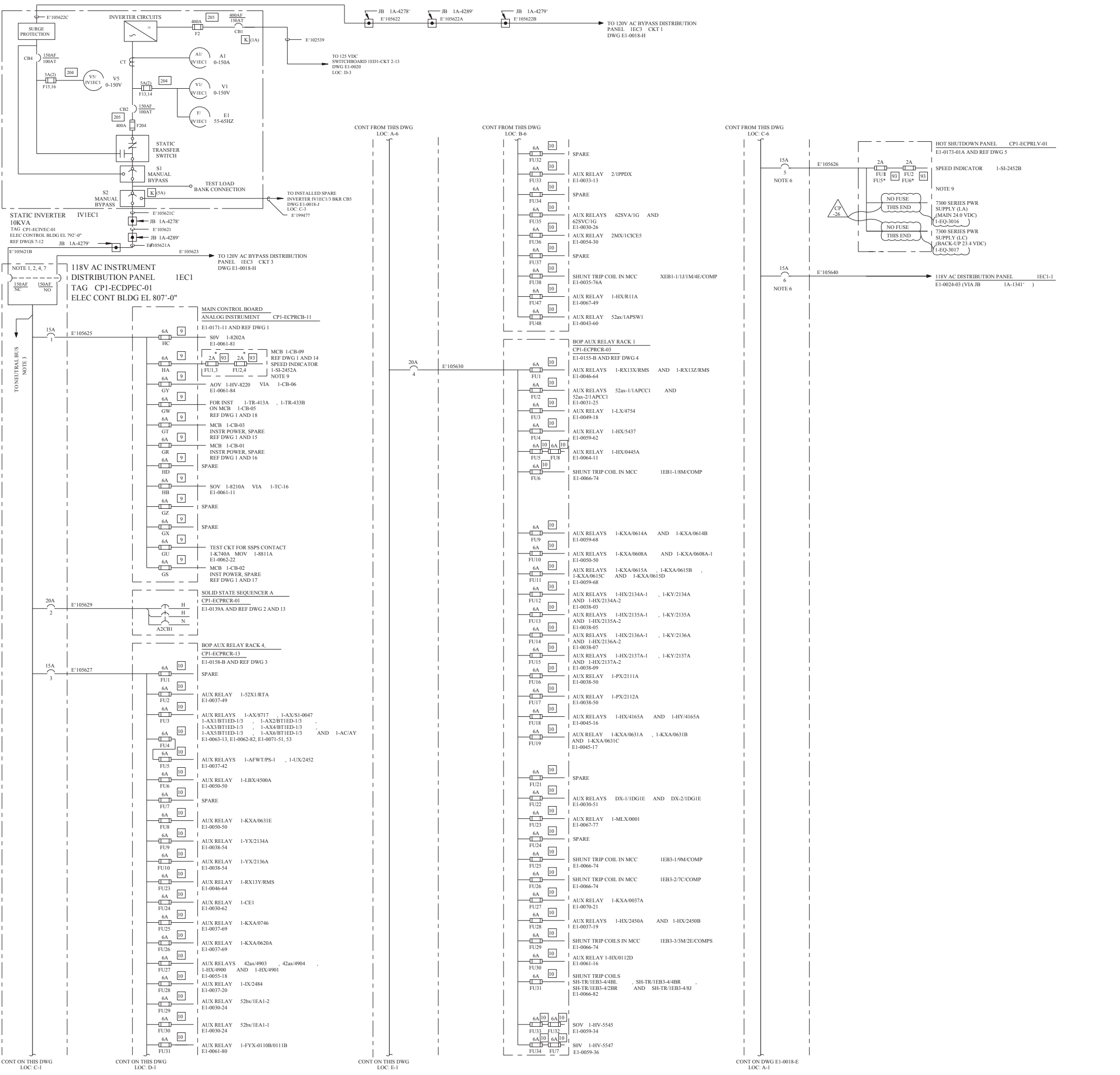
118V AC  
INSTRUMENT BUS DISTRIBUTION  
ONE LINE DIAGRAM

DWG NO	EI-0018	SH NO	B	REV	CP-16
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REV DWG CHK APPD

REMARKS

THIS DRAWING REVISED TO INCORPORATE EDITORIAL CHANGES AS NOTED PER A.I.C.R.2011/011451-1.

**FSAR FIGURE 8.3-15**

**TRAIN A**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SEISMIC CATEGORY 1  
SAFETY CLASS 2 CLASS IF  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT CPNPP**  
GLEN ROSE, TEXAS

**118V AC INSTRUMENT BUS DISTRIBUTION ONE LINE DIAGRAM**

DWG NO	SH NO	REV.
E1-0018	D	CP-26

DRAWING E1-0018-A REV CP-3

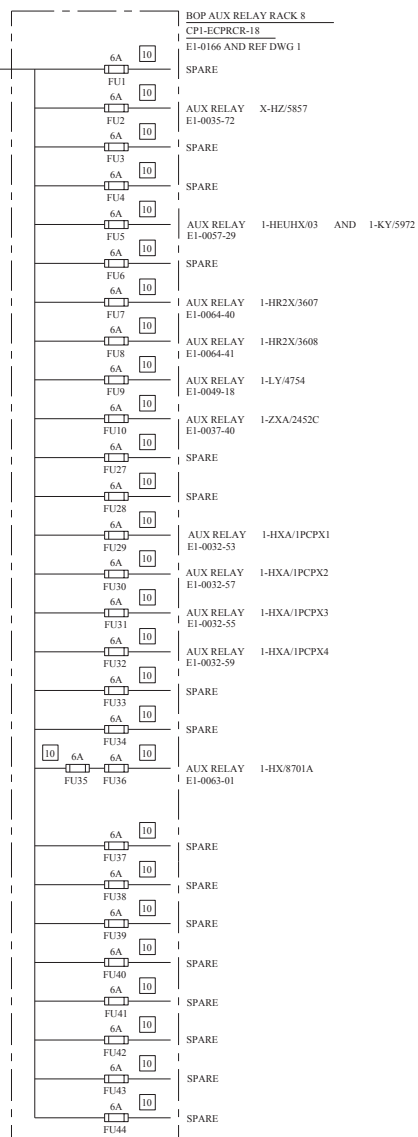
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

E1-0018	E1-0018-E
E1-0018-A	E1-0018-F
E1-0018-B	E1-0018-G
E1-0018-C	E1-0018-H
E1-0018-D	E1-0018-I

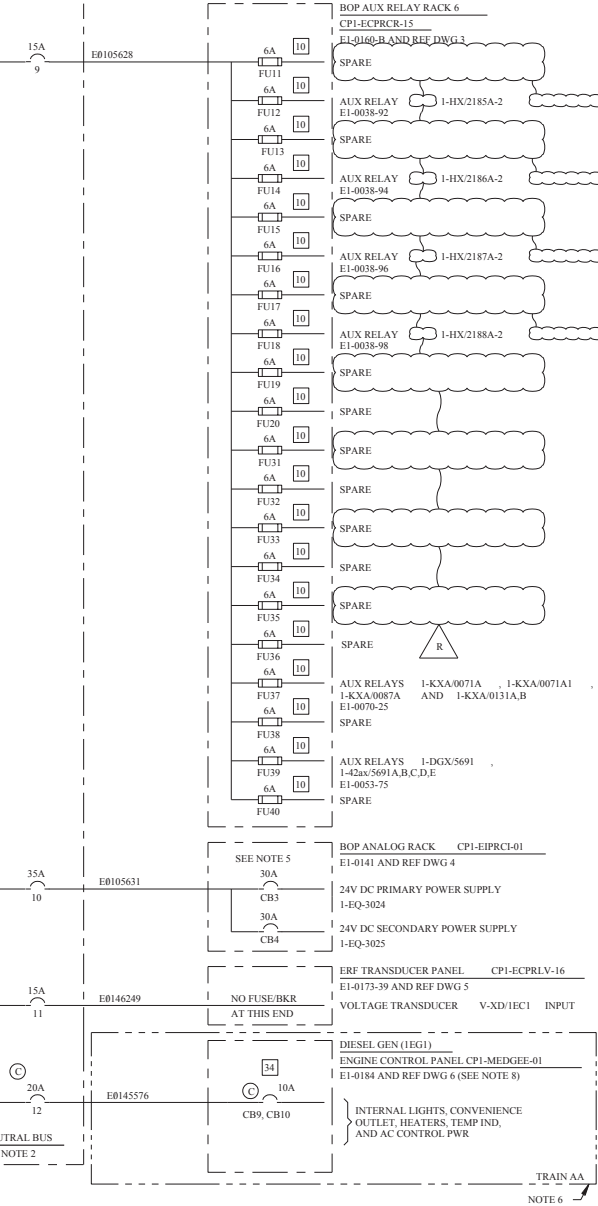
THIS DRAWING CREATED ELECTRONICALLY

118V AC INSTR DISTR  
CONT FROM DWG E1-0018-D LOC E6

PANEL IEC1



CONT FROM THIS  
DWG LOC A6



15A  
7

15A  
8

CONT ON THIS  
DWG LOC C1

REV	DWN	CHKD	APVD	REMARKS
CP-18	04-07	04-07	04-07	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2005-000224-06-00 PER 98-0115-05-000224-06-00

FSAR FIGURE 8.3-15

LEGEND

- 20A - CIRCUIT BREAKER
- 10A - CIRCUIT BREAKER RATING
- 1 - CIRCUIT NUMBER
- 6A - FUSE RATING
- HC - FUSE LOCATION MARKER
- 10 - FUSE B/M ITEM NUMBER REF DWG 7
- ⊙ - SEE NOTE 7

NOTES

1. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
2. VERTICAL NEUTRAL BUS.
3. ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1-NO AND 1-NC CONTACT. FOR SHH SCHEMATICS SEE E1-0071 SERIES DRAWINGS.
4. DELETED
5. CIRCUIT BREAKERS CB1 AND CB2 ARE 15A INSTALLED SPARES.
6. --- ALL WIRING AND CABLING ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS 1E, TRAIN AA. THE FUNCTION OF THE LOAD IS NOT SAFETY RELATED AND THE LOAD CIRCUIT BREAKER IS CLASS 1E.
7. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO CIRCUIT BREAKERS, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER.
8. ALL INTERNALS, COMPONENTS AND WIRING SUPPLIED BY THE FEEDER CIRCUIT BREAKERS ARE NON-CLASS 1E, TRAIN C.

REFERENCE DRAWINGS

1. E-5972 SH 1 AND 4
2. F-25238-ER, H-3845D-AC
3. E-5593 SH 1 AND 2
4. 8815D17, 8815D23 SH 1
5. E-6604
6. 09-500-76001 SH 5
7. E1-0024-04

DRAWING	E1-0018-A	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0018	E1-0018-E		
E1-0018-A	E1-0018-F		
E1-0018-B	E1-0018-G		
E1-0018-C	E1-0018-H		
E1-0018-D			

TRAIN A

CLASS I

(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

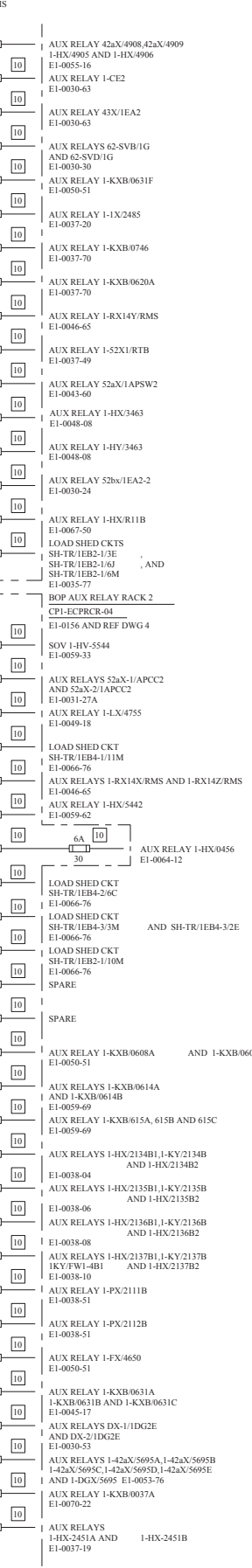
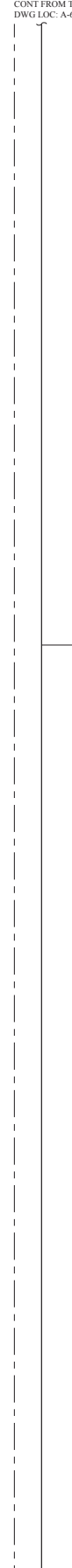
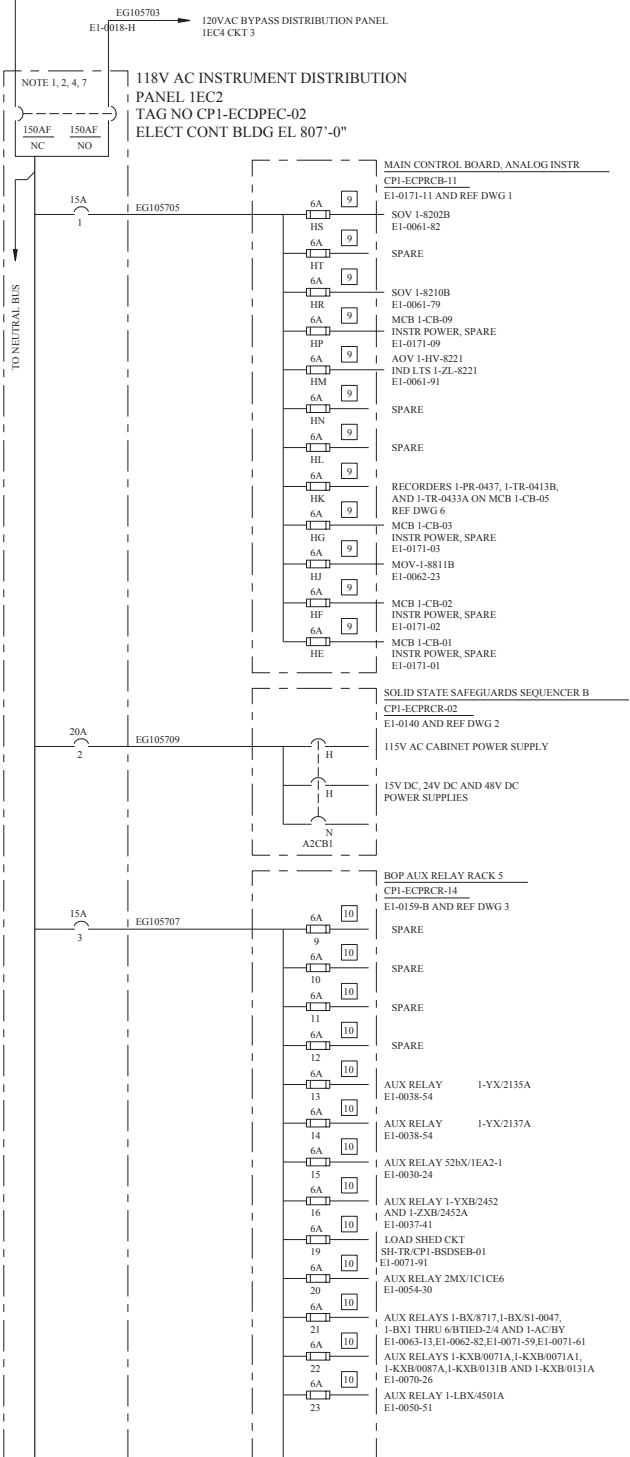
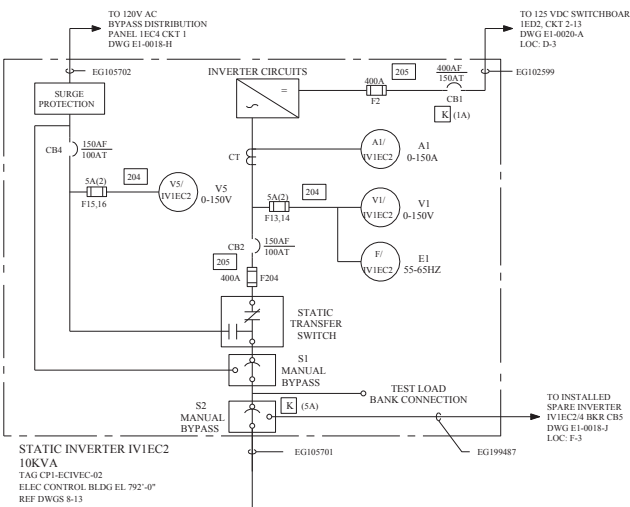
LUMINANT  
CPSES  
GLEN ROSE, TEXAS

118V AC  
INSTRUMENT BUS DISTRIBUTION  
ONE LINE DIAGRAM

DWG NO.	E1-0018	SH NO.	E	REV.	CP-18
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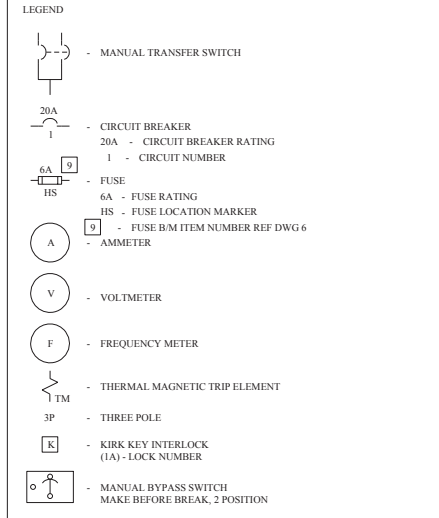
FINAL PRINT

THIS DRAWING CREATED ELECTRONICALLY



REV	DWN	CHKR	APVD	REMARKS
CP-19	11-11-2011			THIS DRAWING REVISED TO INCORPORATE EDITORIAL CHANGES AS NOTED PER A/CR-2011-011451-1.

FSAR FIGURE 8.3-15



- NOTES
- MANUAL TRANSFER SWITCH SHALL BE MOUNTED AT THE BOTTOM OF DISTR PANEL. SWITCH IS NON AUTOMATIC (NO TRIPS)
  - ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - VERTICAL NEUTRAL BUS
  - ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH ARE EQUIPPED WITH 1-NO AND 1-NC AUX CONTACT. FOR SSH INDICATING LIGHT SCHEMATICS SEE E1-0071 SERIES DRAWINGS.
  - DELETED
  - METER/RELAY TAG NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT'S ASSOCIATED WITH (e.g. VM2/IV1EC2).
  - THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES. SEE DBD-EE-043 FOR DETAILS.

- REFERENCE DRAWINGS
- W-CB1701-F SH 6,7
  - 2462-1027 SH 61,62
  - E-5592 SH 1,4
  - VEI-E-5469 SH 1,2
  - W-99X03934-F SH 12,14
  - W-CB-05701 SH 1-5
  - E1-0024-04
  - 10-102722 SH 1,2
  - 10-102723 SH 1
  - 10-102724 SH 1
  - 20-103521 SH 1,2
  - 20-103522 SH 1
  - 20-103523 SH 1

DRAWING	E1-0018-A	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0018	E1-0018-E		
E1-0018-A	E1-0018-F		
E1-0018-B	E1-0018-G		
E1-0018-C	E1-0018-H		
E1-0018-D			

TRAIN B

CLASS I  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1 SERBMC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

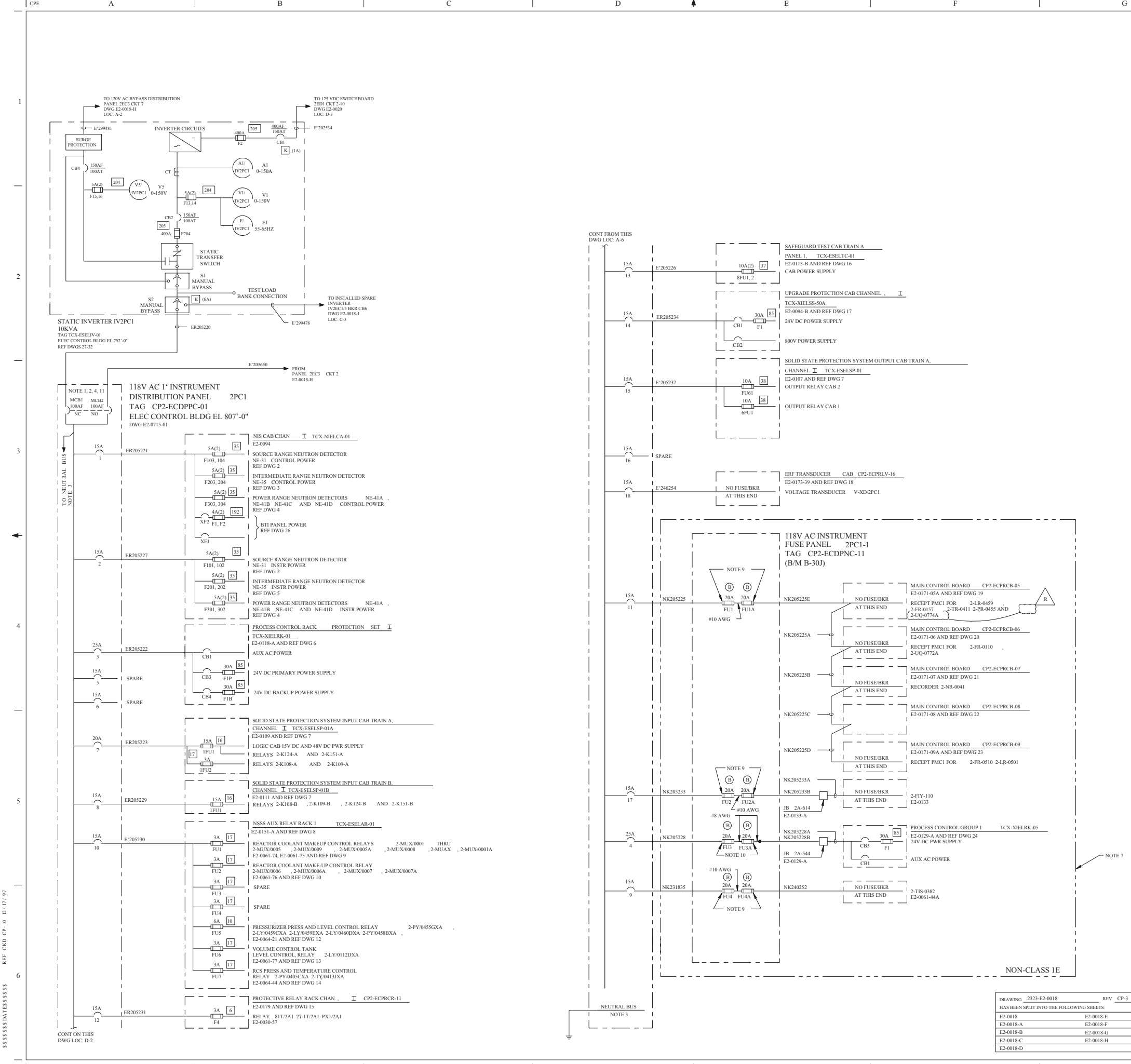
118V AC  
INSTRUMENT DISTRIBUTION  
ONE LINE DIAGRAM

DWG NO.	E1-0018	SH NO.	F	REV.	CP-19
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### FSAR FIGURE 8.3-15

**LEGEND**

- MANUAL TRANSFER SWITCH
- CIRCUIT BREAKER { 15A - CIRCUIT BREAKER RATING, 1 - CIRCUIT NUMBER
- FUSE { 30A - FUSE RATING, F1 - FUSE LOCATION MARKER, 85 - FUSE BM ITEM NUMBER, REF DWG 25
- VOLTMETER
- AMMETER
- FREQUENCY METER
- KIRK KEY INTERLOCK (IA) - LOCK NUMBER
- MANUAL BYPASS SWITCH MAKE BEFORE BREAK, 2 POSITION
- INDICATES SPLICE PER 2323-ES-100
- SEE NOTE 12

**NOTES**

- MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- VERTICAL NEUTRAL BUS.
- ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1 NO AND 1 NC CONTACT. FOR SSH SCHEMATICS SEE E2-0071 SERIES DRAWINGS.
- DELETED.
- EQUIPMENT WITHIN NSSS SCOPE OF SUPPLY. LINES ARE NON-CLASS 1E.
- DELETED.
- BUSS FUSE, LIMITRON FAST ACTING KTK-R FUSE 20 AMP, 600V (CATALOG NUMBER KTK-R-20).
- BUSS FUSE, ONE TIME NON FUSE 20 AMP, 250V (CATALOG NUMBER NON-20).
- THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES, SEE DBD-EE-043 FOR DETAILS.
- THE ISOLATION BETWEEN THE CLASS 1E SOURCE AND THE NON-CLASS 1E LOAD IS PROVIDED BY TWO FUSES IN SERIES INDICATED TO THE ISOLATION DEVICE. THE USE OF NON-CLASS 1E FUSES AND THE ACCEPTABILITY OF PROVIDING ISOLATION AFTER THE NON-CLASS 1E CABLE IS DOCUMENTED IN DBD-EE-057 ATTACH 20 SEC 3.10.1.

**REFERENCE DRAWINGS**

- DELETED
- 6094D63 SH 1
- 6089D33 SH 3
- 6065D99 SH 3
- 6089D33 SH 1
- 8760D65 SH 2 AND 8810D55
- 1084H36 SH 30B (TRAIN A) AND 30C (TRAIN B)
- 1196E96 SH 1, 2, 3, 4
- 271C36 SH 115
- 271C36 SH 116
- 271C36 SH 132
- 271C36 SH 125
- 271C36 SH 126
- 271C36 SH 130
- E-5812
- 955D15 SH 4
- 8760D60 AND 8760D65
- E-6608
- W-CB0814-F SH 1, 2, 5
- W-CB0815-F SH 1, 3
- W-CB07816-F SH 1, 3
- W-CB08817-F SH 6
- W-CB09818-F SH 1, 2, 5
- 8760D65 SH 6 AND 8810D59
- E2-0024-04
- 4D04921
- 20-102722 SH 1, 2
- 20-102723 SH 1
- 20-102724 SH 1
- 20-103521 SH 1, 2
- 20-103522 SH 1
- 20-103523 SH 1

**INDEX DRAWINGS**

- E2-0018 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2PC1 AND 2PC1-1
- E2-0018-A 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2PC2 AND 2PC2-1
- E2-0018-B 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2PC3 AND 2PC3-1
- E2-0018-C 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2PC4 AND 2PC4-1
- E2-0018-D 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2EC1
- E2-0018-E 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2EC2
- E2-0018-F 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2EC3
- E2-0018-G 118VAC INSTRUMENT DISTRIBUTION PANEL BOARD 2EC4

**CHANNEL I**

**CLASS I**  
(NUCLEAR SAFETY RELATED)

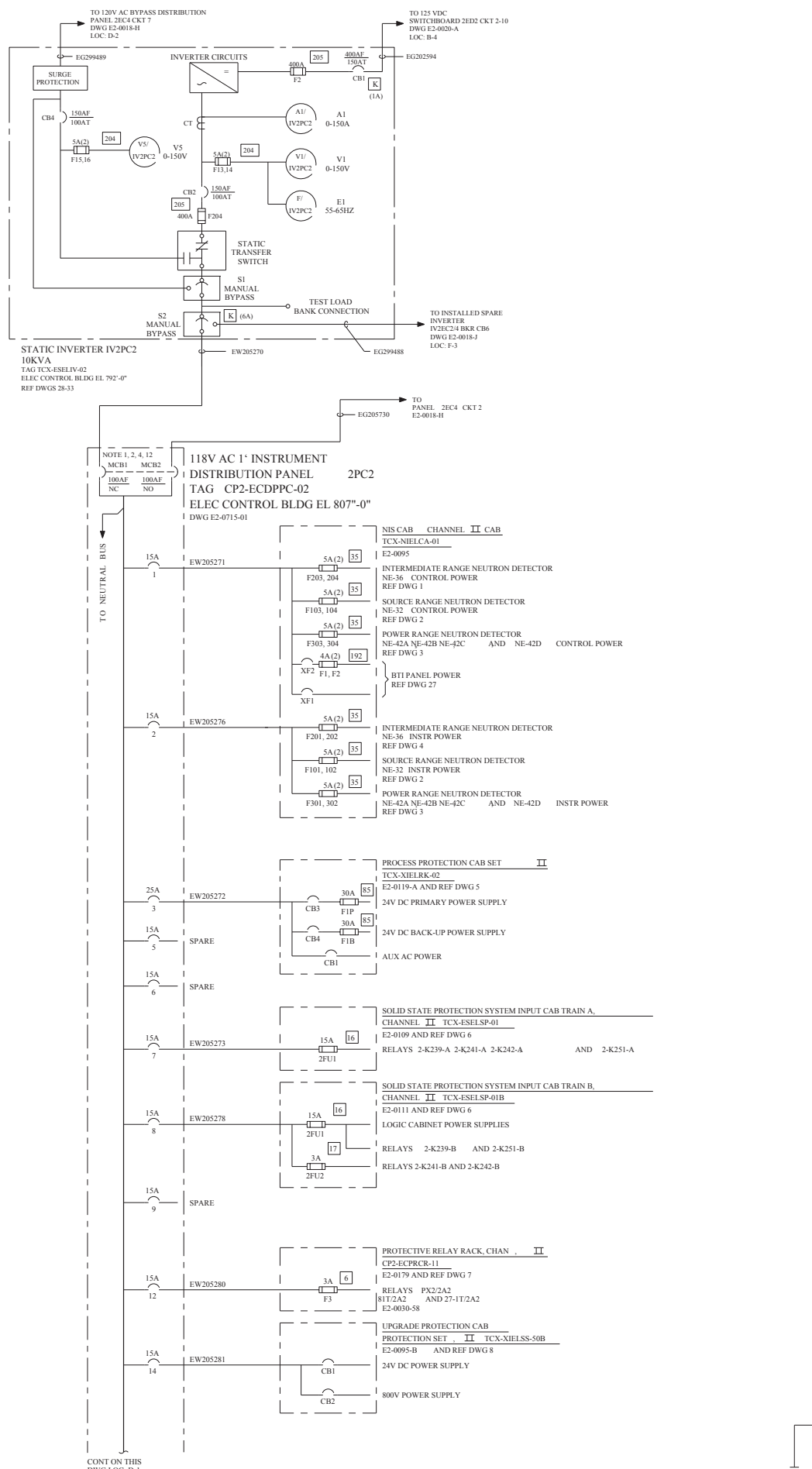
SAFETY CLASS 1      SEISMIC CATEGORY I  
SAFETY CLASS 2      CLASS 1E  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

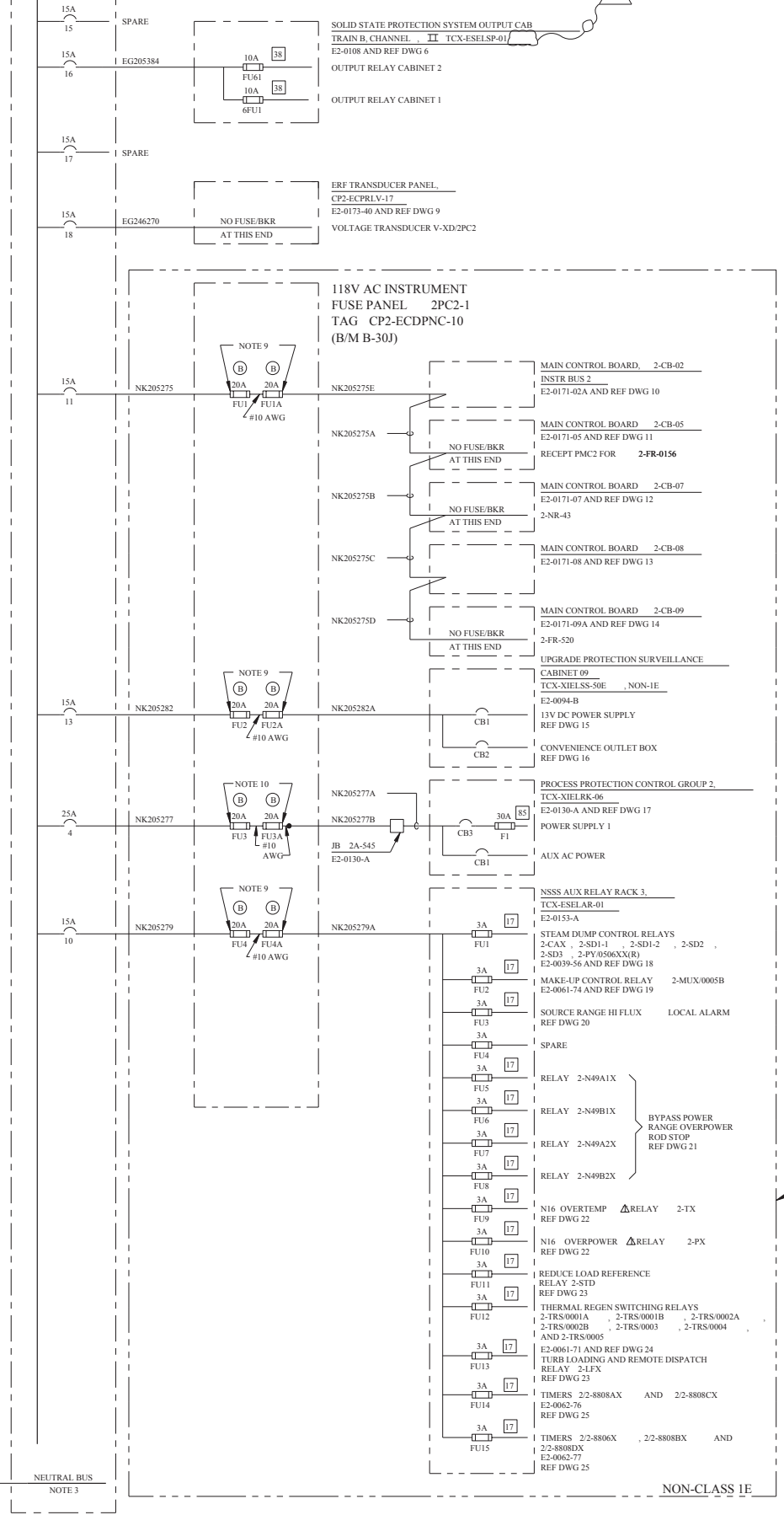
**118VAC INSTRUMENT BUS DISTRIBUTION ONE LINE DIAGRAM**

DWG NO. E2-0018	REV. CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0018	E2-0018-E
E2-0018-A	E2-0018-F
E2-0018-B	E2-0018-G
E2-0018-C	E2-0018-H
E2-0018-D	

THIS DRAWING CREATED ELECTRONICALLY



CONT FROM THIS DWG LOC: A-6



REV	CHKD	APPD	REMARKS
CP-13	11-08-2012	11-08-2012	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE TBA 2012-090201-00 PER SR-0001-12-0002041-00

**FSAR FIGURE 8.3-15**

- LEGEND**
- MANUAL TRANSFER SWITCH
  - CIRCUIT BREAKER
  - 15A - CIRCUIT BREAKER RATING
  - 1 - CIRCUIT NUMBER
  - FUSE
  - 5A - FUSE RATING
  - (2) - QUANTITY
  - F203 - FUSE LOCATION MARKER
  - 35 - FUSE B/M ITEM NUMBER REF DWG 26
  - VOLTMETER
  - AMMETER
  - FREQUENCY METER
  - KIRK KEY INTERLOCK (1A) - LOCK NUMBER
  - MANUAL BYPASS SWITCH MAKE BEFORE BREAK, 2 POSITION
  - INDICATES SPLICE PER 2323-ES-100
  - SEE NOTE 13

- NOTES**
- MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
  - ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - VERTICAL NEUTRAL BUS.
  - ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1-NO AND 1-NC CONTACT. FOR SH SCHEMATICS SEE E2-0071 SERIES DRAWINGS.
  - DELETED.
  - EQUIPMENT WITHIN NSSS SCOPE OF SUPPLY.
  - EQUIPMENT AND CABLES ENCLOSED BY DASHED LINES ARE NON-CLASS 1E.
  - METER REFERENCE TAG NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. 2AM/IV2PC2).
  - BUSS FUSE, LIMITRON FAST ACTING KTR-R FUSE 20 AMP, 600V (CATALOG NUMBER KTR-K-R-20).
  - BUSS FUSE, ONE TIME NON FUSE 20 AMP, 250V (CATALOG NUMBER NON-20).
  - DELETED.
  - THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES, SEE DBD-EE-043 FOR DETAILS.
  - THE ISOLATION BETWEEN THE CLASS 1E SOURCE AND THE NON-CLASS 1E LOAD IS PROVIDED BY TWO FUSES IN SERIES INDICATED (B) TO THE ISOLATION DEVICE. THE USE OF NON-CLASS 1E FUSES AND THE ACCEPTABILITY OF PROVIDING ISOLATION AFTER THE NON-CLASS 1E CABLE IS DOCUMENTED IN DBD-EE-057 ATTACH 20 SEC 3.1.0.

**REFERENCE DRAWINGS**

1. 609D33 SH 3	18. 271C336 SH 110
2. 6094D63 SH 1	19. 271C336 SH 114
3. 6065D99 SH 3	20. 271C336 SH 118
4. 609D33 SH 1	21. 271C336 SH 120
5. 8810D56	22. 271C336 SH 122
6. 1084H36 SH 30	23. 271C336 SH 123
7. E-5812	24. 271C336 SH 127
8. 8833D43 SH 1, 8833D29 SH 1	25. 1196E96 SH 1-10
9. E-6603, E-6610	26. E2-0024-04
10. CB02811-F SH 1-5	27. 4D04921
11. W-CB05814-F SH 1-5	28. 20-102722 SH 1, 2
12. W-CB07816-F SH 1-7	29. 20-102723 SH 1
13. W-CB08817-F SH 1-3	30. 20-102724 SH 1
14. W-CB05818-F SH 1-5	31. 20-103521 SH 1, 2
15. 8833D2, SH 1	32. 20-103522 SH 1
16. 8833D42, 8833D43	33. 20-103523 SH 1
17. 8760D65 SH 7	

DRAWING	REV
2323-E2-0018	CP-3

HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

E2-0018	E2-0018-E
E2-0018-A	E2-0018-F
E2-0018-B	E2-0018-G
E2-0018-C	E2-0018-H
E2-0018-D	

**CHANNEL TCX-ESELS-01**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1  
SAFETY CLASS 2  
SAFETY CLASS 3

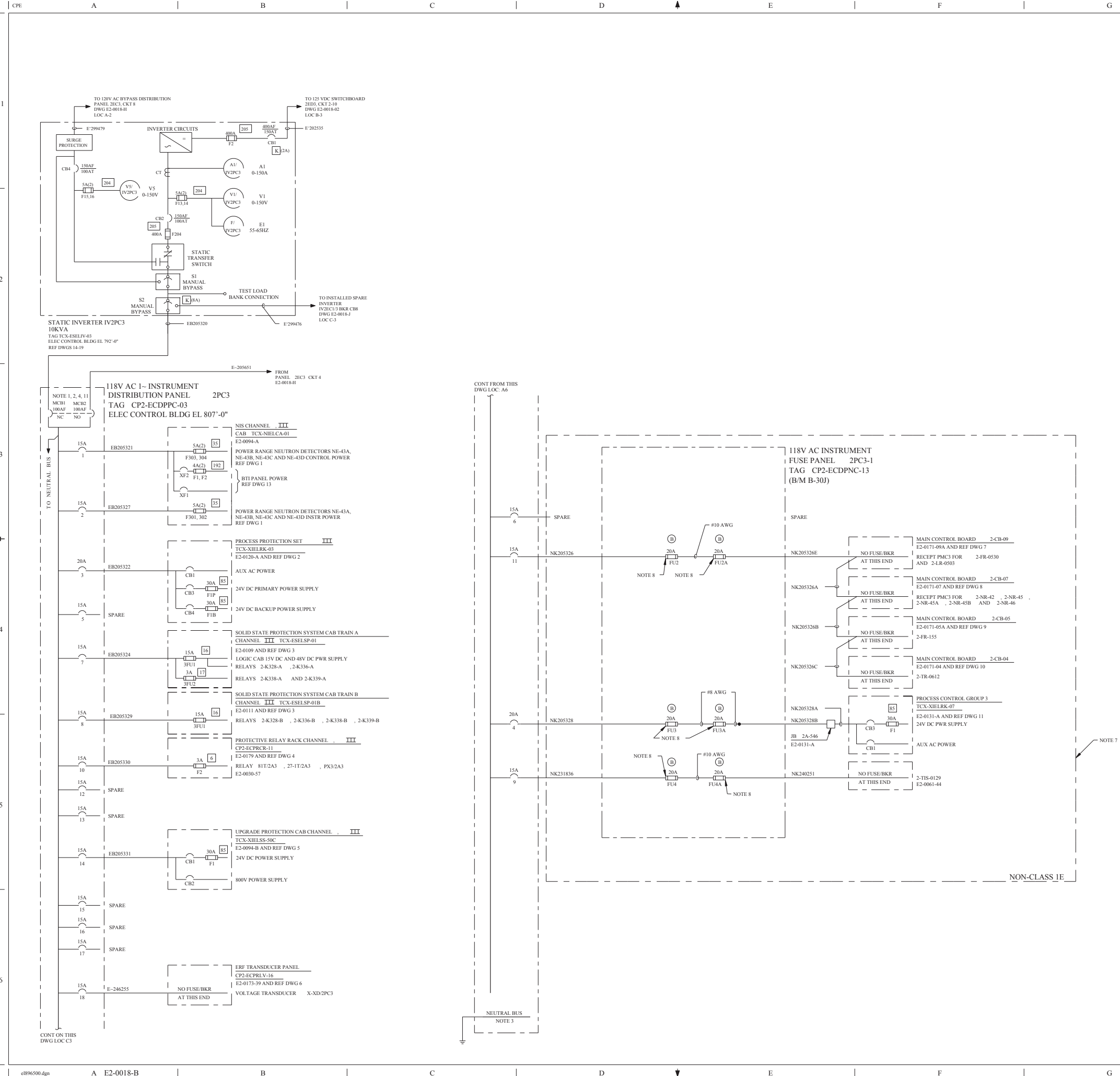
**LUMINANT CPNPP**  
GLEN ROSE, TEXAS

**118V AC INSTRUMENT BUS DISTRIBUTION ONE LINE DIAGRAM**

DWG NO.	SH NO.	REV.
E2-0018	A	CP-13

THIS DRAWING CREATED ELECTRONICALLY





REV	CHKD	APPD	REMARKS
CP-12	SM	SM	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2013-000168-01-00 PER SK-0001-13-000168-01-00

**FSAR FIGURE 8.3-15**

- LEGEND**
- MANUAL TRANSFER SWITCH
  - CIRCUIT BREAKER  
15A - CIRCUIT BREAKER RATING  
1 - CIRCUIT NUMBER
  - FUSE  
5A (2) - FUSE RATING  
2 - QUANTITY  
F303 - FUSE LOCATION MARKER  
35 - FUSE B/M ITEM NUMBER REF DWG 12
  - VOLTMETER
  - AMMETER
  - FREQUENCY METER
  - KIRK KEY INTERLOCK  
(1A) - LOCK NUMBER
  - MANUAL BYPASS SWITCH  
MAKE BEFORE BREAK, 2 POSITION
  - INDICATES SPLICE PER 2323-ES-100
  - SEE NOTE 12

- NOTES**
1. MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. VERTICAL NEUTRAL BUS.
  4. ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1-NO AND 1-NC CONTACT. FOR SSH SCHEMATICS SEE E2-0071 SERIES DRAWINGS.
  5. DELETED
  6. - EQUIPMENT WITHIN NSSS SCOPE OF SUPPLY.
  7. - NON-CLASS 1E
  8. BY DASHED LINES ARE NON-CLASS 1E
  9. FUSES FU1, 1A, 2, 2A, 4 AND 4A ARE BUSS FUSE, LIMITRON FAST ACTING KTK-R FUSE 20 AMP, 600V (CATALOG NUMBER KTK-R-20). FUSES FU3 AND 3A ARE BUSSMANN TYPE NON-20.
  10. DELETED
  11. THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES, SEE DBD-EE-043 FOR DETAILS.
  12. THE ISOLATION BETWEEN THE CLASS 1E SOURCE AND THE NON-CLASS 1E LOAD IS PROVIDED BY TWO FUSES IN SERIES INDICATED TO THE ISOLATION DEVICE. THE USE OF NON-CLASS 1E FUSES AND THE ACCEPTABILITY OF PROVIDING ISOLATION AFTER THE NON-CLASS 1E CABLE IS DOCUMENTED IN DBD-EE-057 ATTACH 20 SEC 3.10.1.

- REFERENCE DRAWINGS**
1. 6065D99 SH 3
  2. 8810D41
  3. 1084H36 SH 30
  4. E-5812
  5. 8833D80
  6. E-6608, E-6603
  7. W-CB09818-F SH 1-5
  8. W-CB07816-F SH 1-3
  9. W-CB05814-F SH 1-5
  10. W-CB04813-F SH 1-3
  11. 8810D41
  12. E2-0024-04
  13. 4D04921
  14. 20-102722 SH 1, 2
  15. 20-102723 SH 1
  16. 20-102724 SH 1
  17. 20-103521 SH 1, 2
  18. 20-103522 SH 1
  19. 20-103523 SH 1

DRAWING	2323-E2-0018	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E2-0018	E2-0018-E		
E2-0018-A	E2-0018-F		
E2-0018-B	E2-0018-G		
E2-0018-C	E2-0018-H		
E2-0018-D	E2-0018-I		

**CHANNEL III**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1	SEISMIC CATEGORY 1
SAFETY CLASS 2	ASSOCIATED CIRCUITS
SAFETY CLASS 3	

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

**118V AC INSTRUMENT BUS DISTRIBUTION ONE LINE DIAGRAM**

DWG NO	E2-0018	REV	B
			CP-12

REF CHD CP-8 12-17-97

THIS DRAWING CREATED ELECTRONICALLY





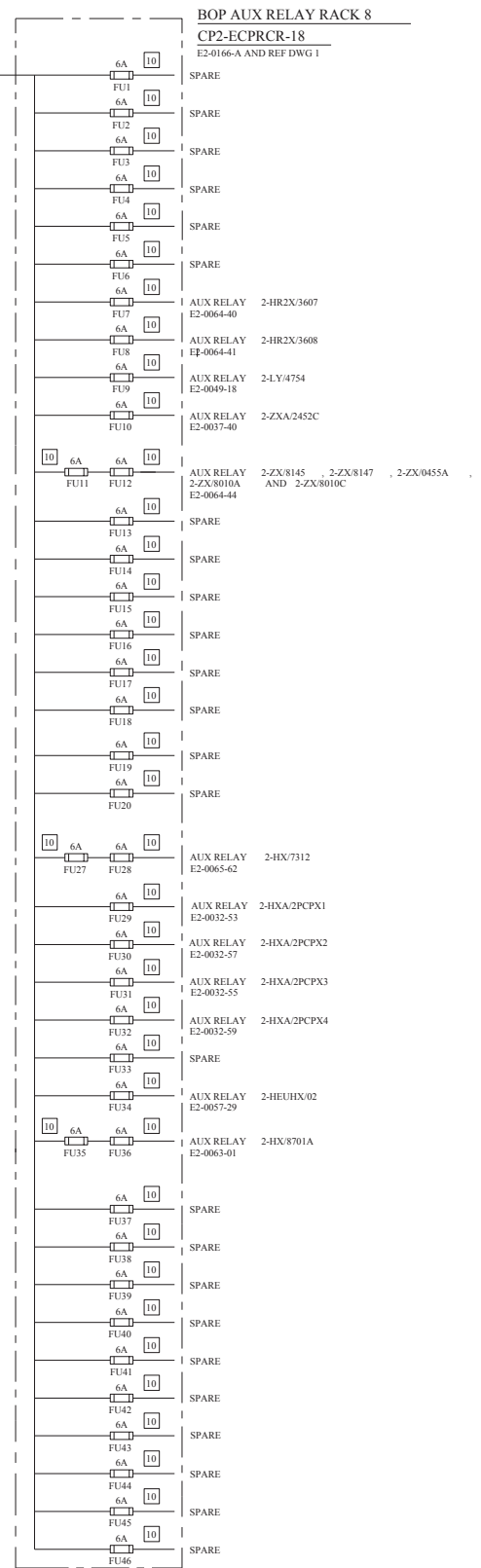
118V AC INSTR DISTR  
CONT FROM DWG E2-0018-D LOC: E-6

PANEL 2EC1

**BOP AUX RELAY RACK 8**

**CP2-ECPRCR-18**

E2-0166-A AND REF DWG 1

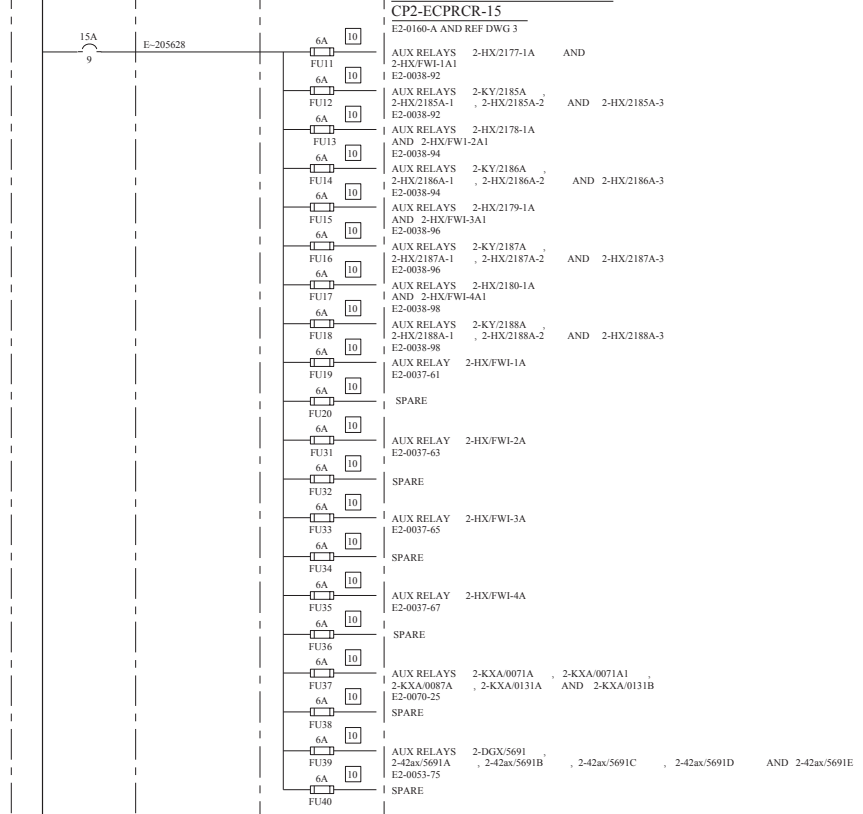


CONT FROM THIS  
DWG LOC: A-6

**BOP AUX RELAY RACK 6**

**CP2-ECPRCR-15**

E2-0160-A AND REF DWG 3



**BOP ANALOG RACK CP2-EIPRCI-01**

E2-0141-A AND REF DWG 4

24V DC PWR SUPPLY  
24V DC PWR SUPPLY

**ERF TRANSDUCER PANEL CP2-ECPRLV-16**

E2-0173-39 AND REF DWG 5

VOLTAGE TRANSDUCER V-XD/2EC1 INPUT

**DIESEL GENERATOR ( 2EG1 )**

ENGINE CONTROL PANEL CP2-MEDGEE-01

E2-0184 AND REF DWG 6 (SEE NOTE 7)

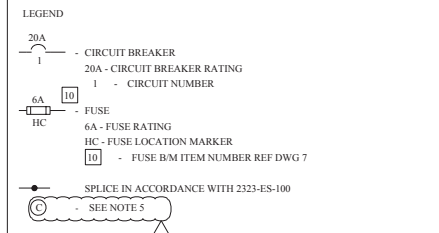
INTERNAL LIGHTS, CONVENIENCE OUTLET, HEATERS, TEMP IND, AND AC CONTROL PWR



TRAIN AA

REV	DWN	CHK	APPV	REMARKS
CP-11	MM	MM	MM	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-1999-02206-02-00 PER 98-0015-99-02206-02-00

**FSAR FIGURE 8.3-15**



- NOTES
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - VERTICAL NEUTRAL BUS.
  - ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH IN DISTRIBUTION PANEL ARE EQUIPPED WITH 1-NO AND 1-NC CONTACT. FOR SSIH SCHEMATICS SEE E2-0071 SERIES DRAWINGS.
  - ALL WIRING AND CABLING ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS 1E. TRAIN AA. THE FUNCTION OF THE LOAD IS NOT SAFETY RELATED AND THE LOAD CIRCUIT BREAKER IS CLASS 1E.
  - ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOAD IS PROVIDED BY TWO CIRCUIT BREAKERS, EACH COORDINATED WITH THE BUS UPSTREAM CIRCUIT BREAKER, INDICATED BY NEXT TO THE BREAKER.
  - THE CABLE BETWEEN THE TWO CIRCUIT BREAKERS PROVIDING ISOLATION FROM THE CLASS 1E BUS IS SAFETY RELATED, THOUGH TAGGED AS ASSOCIATED CLASS 1E.
  - ALL INTERNALS, COMPONENTS AND WIRING SUPPLIED BY THE FEEDER CIRCUIT BREAKERS ARE NON-CLASS 1E, TRAIN C.

- REFERENCE DRAWINGS
- E-5976 SH 1 AND 4
  - F-25338-ER, H-38450-AC
  - E-5668 SH 1 AND 2
  - 8815D17, 8815D23 SH 1
  - E-6608
  - 09-500-76001 SH 5
  - E2-0024-04

DRAWING 2323-E2-0018	REV CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0018	E2-0018-E
E2-0018-A	E2-0018-F
E2-0018-B	E2-0018-G
E2-0018-C	E2-0018-H
E2-0018-D	

**TRAIN A**

**CLASS I**

(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS 1E ASSOCIATED CIRCUITS  
SAFETY CLASS 3

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

118V AC  
INSTRUMENT BUS DISTRIBUTION  
ONE LINE DIAGRAM

DWG NO	REV	SH NO	REV
E2-0018	E		CP-11

+ Approved LDCRs

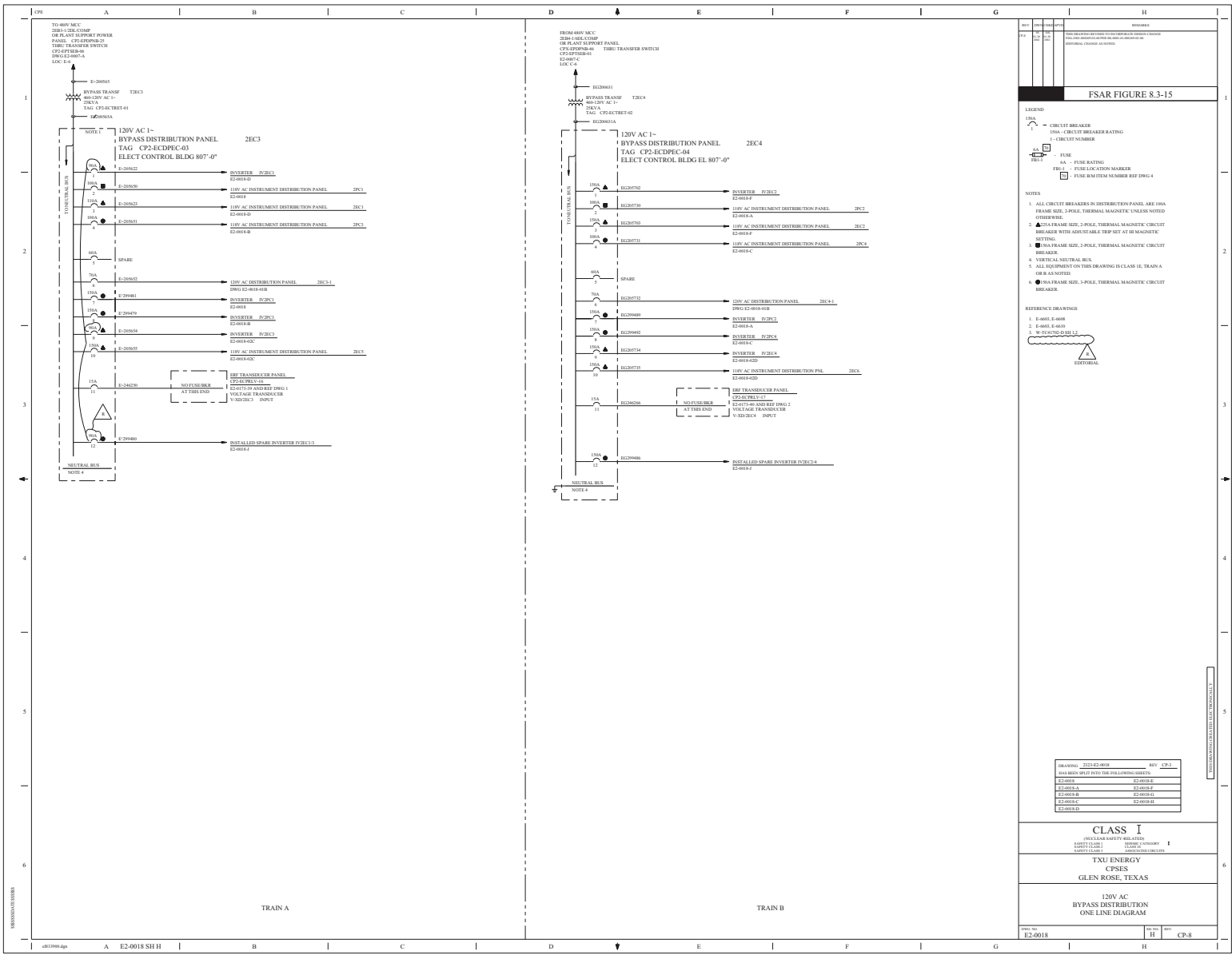
THIS DRAWING CREATED ELECTRONICALLY

REF CKD CP-6 12-17-97









REV	DATE	BY	CHKD	DESCRIPTION
1	02/20/18	CP-3		ISSUED FOR CONSTRUCTION
2	02/20/18	CP-3		REVISED TO ADD 120V AC 1-1 BYPASS TRANSFER PANEL
3	02/20/18	CP-3		REVISED TO ADD 120V AC 1-1 BYPASS TRANSFER PANEL
4	02/20/18	CP-3		REVISED TO ADD 120V AC 1-1 BYPASS TRANSFER PANEL

FSAR FIGURE 8.3-15

- LEGEND**
- 100A - CIRCUIT BREAKER
  - 100A - CIRCUIT BREAKER RATING
  - 100A - CIRCUIT NUMBER
  - 100A - FUSE
  - 100A - FUSE RATING
  - 100A - FUSE LOCATION MARKER
  - 100A - FUSE IN ITEM NUMBER REF DWG 4

- NOTES**
1. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 3-POLE, THERMAL-MAGNETIC UNLESS NOTED OTHERWISE.
  2. 100A FRAME SIZE, 3-POLE, THERMAL-MAGNETIC CIRCUIT BREAKER WITH ADJUSTABLE TRIP SET AT 100 AMPERES.
  3. 100A FRAME SIZE, 3-POLE, THERMAL-MAGNETIC CIRCUIT BREAKER.
  4. VERTICAL NEUTRAL BUS.
  5. ALL EQUIPMENT ON THIS DRAWING IS CLASS 1L TRAIN A OR B AS NOTED.
  6. 100A FRAME SIZE, 3-POLE, THERMAL-MAGNETIC CIRCUIT BREAKER.

- REFERENCE DRAWING**
1. E-600, E-600
  2. E-600, E-600
  3. W-34 (INS) 04U 12



DRAWING	2221-02-0018	REV	CP-3
DATE	02/20/18	BY	CP-3
DATE	02/20/18	CHKD	CP-3
DATE	02/20/18	APPD	CP-3
DATE	02/20/18	ISSD	CP-3

**CLASS I**  
ONE LINE DIAGRAM OF 120V AC 1-1 BYPASS TRANSFER PANEL

TXU ENERGY  
 CPSES  
 GLEN ROSE, TEXAS

120V AC  
 BYPASS DISTRIBUTION  
 ONE LINE DIAGRAM

REV	DWN	CHKD	APVD	REMARKS
CP-16	MR	GW		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2005-001364-18-07 PER SK-0006-05-001364-18-02

**FSAR FIGURE 8.3-15**

- LEGEND**
- 3A - FUSE RATING
  - 2 - FUSE LOCATION MARKER
  - 8 - FUSE B/M ITEM NUMBER REF DWG 1
  - GROUND
  - [1] - INDICATES WIRE PREFIX 1EC11
  - [2] - INDICATES WIRE PREFIX XEC1-1-1

- NOTES**
- PANELBOARD ENCLOSURES SHALL BE GROUNDED BY MEANS OF EXTERNAL GROUND LUG JUMPER FROM INTERNAL GROUND BUS TO EXTERNAL GROUND SHALL BE #10 AWG WIRE.
  - CABLES ENCLOSED INSIDE DASHED LINE ARE ASSOCIATED CLASS 1E, TRAIN AA.
  - DIST PANEL XEC1-1-1 IS A COMMON PANEL, NO UTILIZED LOAD SHALL BE ADDED TO THIS PANEL.
  - CABLES ENCLOSED INSIDE DASHED LINE ARE NON-CLASS 1E, TRAIN C.

- REFERENCE DRAWINGS**
- E1-0024-04

DRAWING	E1-0024-03	REV	CP-4
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0024-03			
E1-0024-03A			
E1-0024-03B			

**TRAIN A**

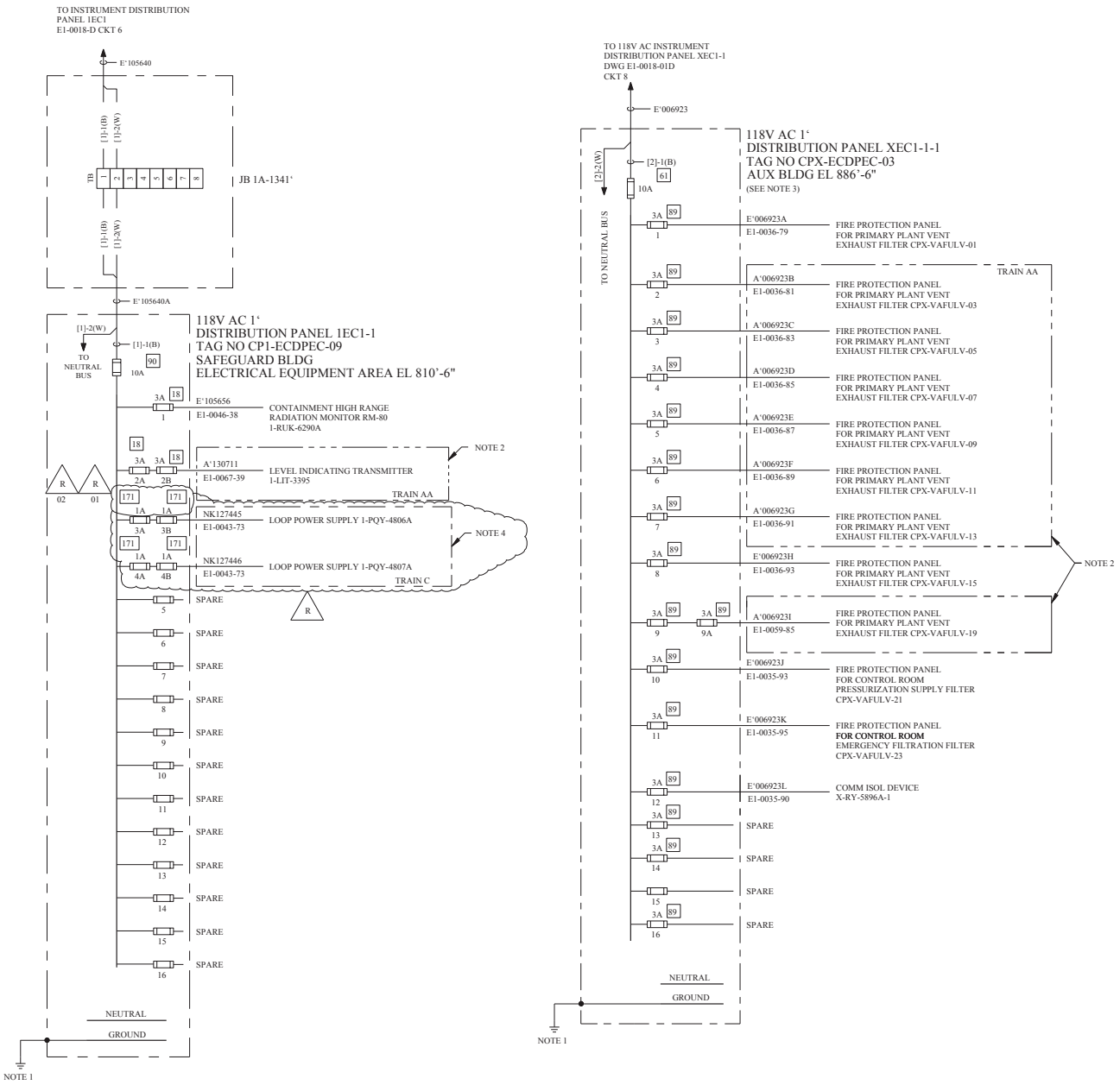
**CLASS I**

(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1      SERVIC CATEGORY      I  
SAFETY CLASS 2      CLASS I  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

**LUMINANT  
CPNPP  
GLEN ROSE, TEXAS**

118V AC  
COMMON AND UNIT 1  
INSTRUMENT DISTRIBUTION PANELS  
ONE LINE DIAGRAM

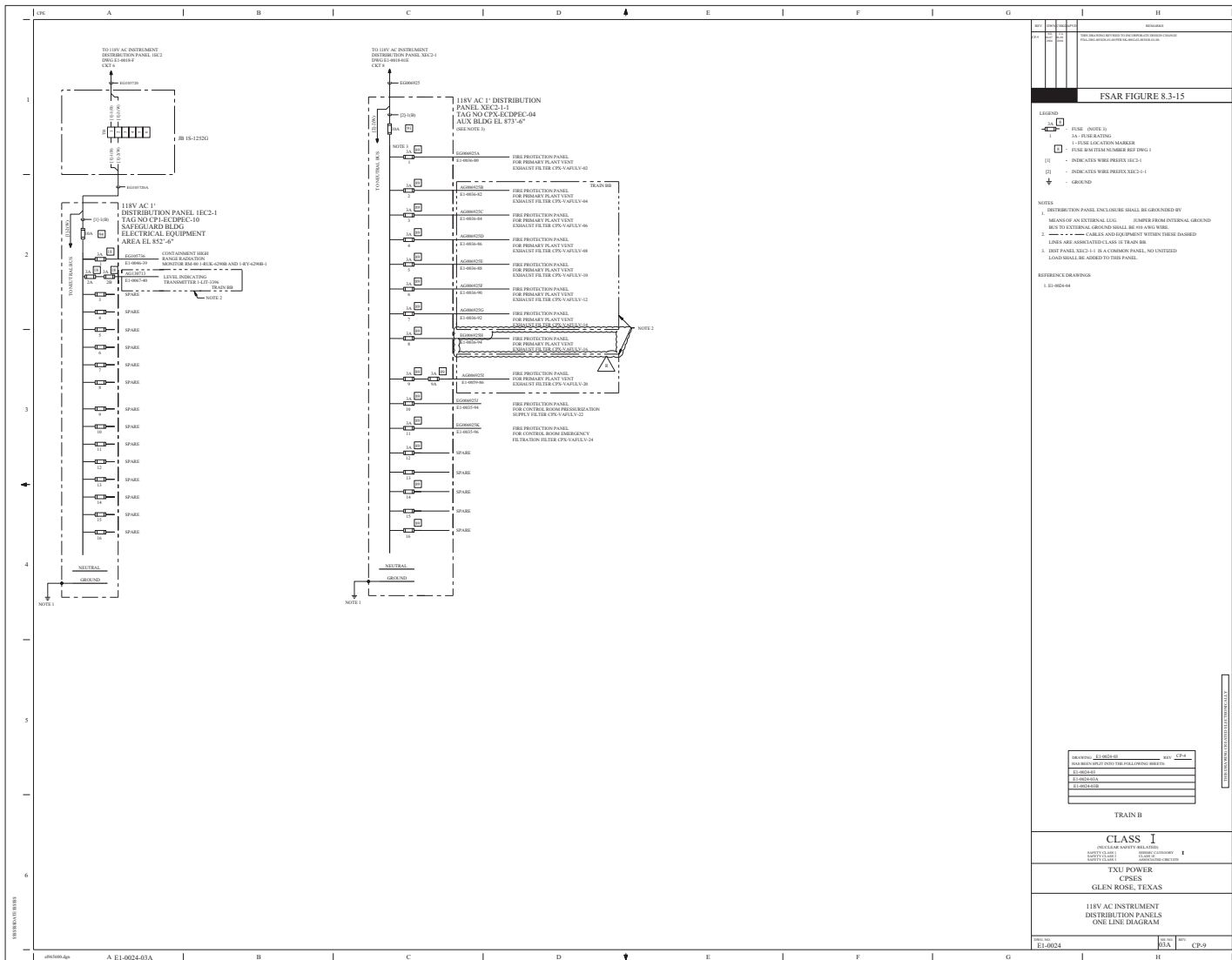
DWG NO.	E1-0024	SHEET NO.	03	REV	CP-16
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SSSSSDATISSSSS

THIS DRAWING CREATED ELECTRONICALLY





**FSAR FIGURE 8.3-15**

- LEGEND**
- (with 'F') FIRE PROTECTION PANEL (NOTE 1)
  - (with 'S') SPARE PANEL (NOTE 1)
  - (with 'G') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-42
  - (with 'V') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-44
  - (with '6') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-46
  - (with '8') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-48
  - (with '10') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-10
  - (with '12') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-12
  - (with '14') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-14
  - (with '16') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-16
  - (with '18') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-18
  - (with '20') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-20
  - (with '22') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-22
  - (with '24') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-24
  - (with '26') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-26
  - (with '28') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-28
  - (with '30') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-30
  - (with '32') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-32
  - (with '34') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-34
  - (with '36') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-36
  - (with '38') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-38
  - (with '40') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-40
  - (with '42') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-42
  - (with '44') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-44
  - (with '46') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-46
  - (with '48') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-48
  - (with '50') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-50
  - (with '52') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-52
  - (with '54') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-54
  - (with '56') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-56
  - (with '58') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-58
  - (with '60') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-60
  - (with '62') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-62
  - (with '64') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-64
  - (with '66') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-66
  - (with '68') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-68
  - (with '70') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-70
  - (with '72') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-72
  - (with '74') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-74
  - (with '76') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-76
  - (with '78') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-78
  - (with '80') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-80
  - (with '82') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-82
  - (with '84') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-84
  - (with '86') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-86
  - (with '88') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-88
  - (with '90') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-90
  - (with '92') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-92
  - (with '94') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-94
  - (with '96') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-96
  - (with '98') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-98
  - (with '100') FIRE PROTECTION PANEL FOR PRIMARY PLANT VENT ENDSTAY PREFER CP-9/AFPLY-100

- NOTES**
1. DISTRIBUTION PANEL ENCLOSURE SHALL BE GROUNDED BY MEANS OF AN EXTERNAL LEAD. LEADS FROM EXTERNAL GROUND MUST BE EXTERNAL GROUND SHALL BE 60 AWG WIRE.
  2. --- CABLES AND/OR EQUIPMENT WITH THESE CABLED LINES ARE ASSOCIATED CLASS II TRAIN B.
  3. DIST. PANEL 118V AC 1' IS A CHARGER PANEL, NO UNLIMITED LOAD SHALL BE ADDED TO THIS PANEL.

REFERENCE DRAWINGS  
 1. E1-002-06

DRAWING: E1-002-03A	REV: 001
DATE: 08/11/04	BY: JLD
DESIGNED BY: JLD	CHECKED BY: JLD
APPROVED BY: JLD	DATE: 08/11/04

**TRAIN B**

**CLASS 1**  
CLASS 1 - ALL SYSTEMS ARE CLASSIFIED AS CLASS 1 EXCEPT WHERE SHOWN OTHERWISE

**TXU POWER**  
 CPSES  
 GLEN ROSE, TEXAS

118V AC INSTRUMENT DISTRIBUTION PANELS ONE-LINE DIAGRAM

DATE: 08/11/04 10:14 AM CP-9

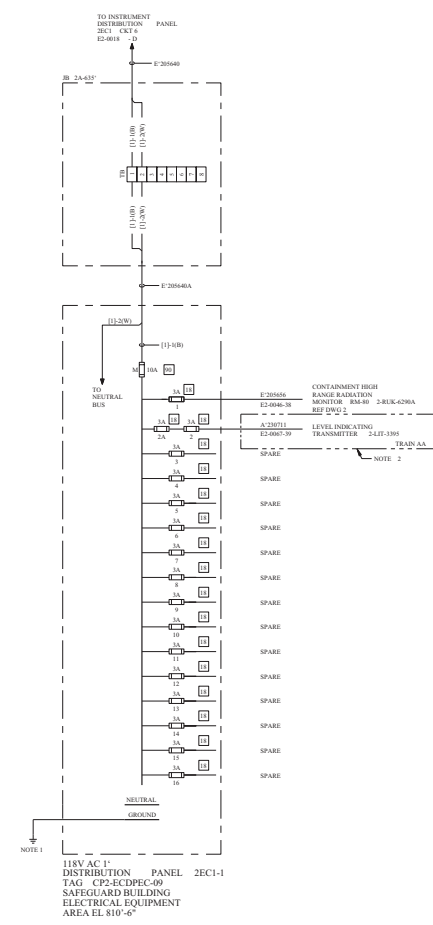


**FSAR FIGURE 8.3-15**

- LEGEND**
- 1 - FUSE
  - 1A - FUSE RATING
  - 2 - FUSE LOCATION MARKER
  - 1 - FUSE ITEM NUMBER REF DWG 1
  - ⏚ - GROUND
  - (1) - INDICATES WIRE PREFIX 2EC1-1

- NOTES**
1. PANELBOARD ENCLOSURES SHALL BE GROUNDING BY MEANS OF EXTERNAL GROUND LINES NUMBER FROM EXTERNAL GROUND BUS TO EXTERNAL GROUND SHALL BE #10 AWG WIRE.
  2. CABLES ENCLOSED INSIDE THESE DASHED LINES ARE ASSOCIATED CLASS 'I', TRAIN 'AA'.
  3. DELETED.
  4. ALL EQUIPMENT DEVICES SHOWN ON THIS DWG ARE CLASS 'II' AND CABLES ARE CLASS 'II', TRAIN 'A' UNLESS OTHERWISE NOTED.
  5. WHERE PHASE SEQUENCING CANNOT BE MAINTAINED PER SPEC CP2-2-206 IN PANEL 2010-1, EACH PHASE SHALL BE READILY IDENTIFIED.
  6. EQUIPMENT ENCLOSED INSIDE THESE DASHED LINES ARE TRAIN 'C'.

- REFERENCE DRAWINGS**
1. E2-0024-04 (LATER)
  2. 0305-4728



DRAWING: E2-0024-01	REV: CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0024-01	
E2-0024-04A	
E2-0024-01B	

TRAIN A

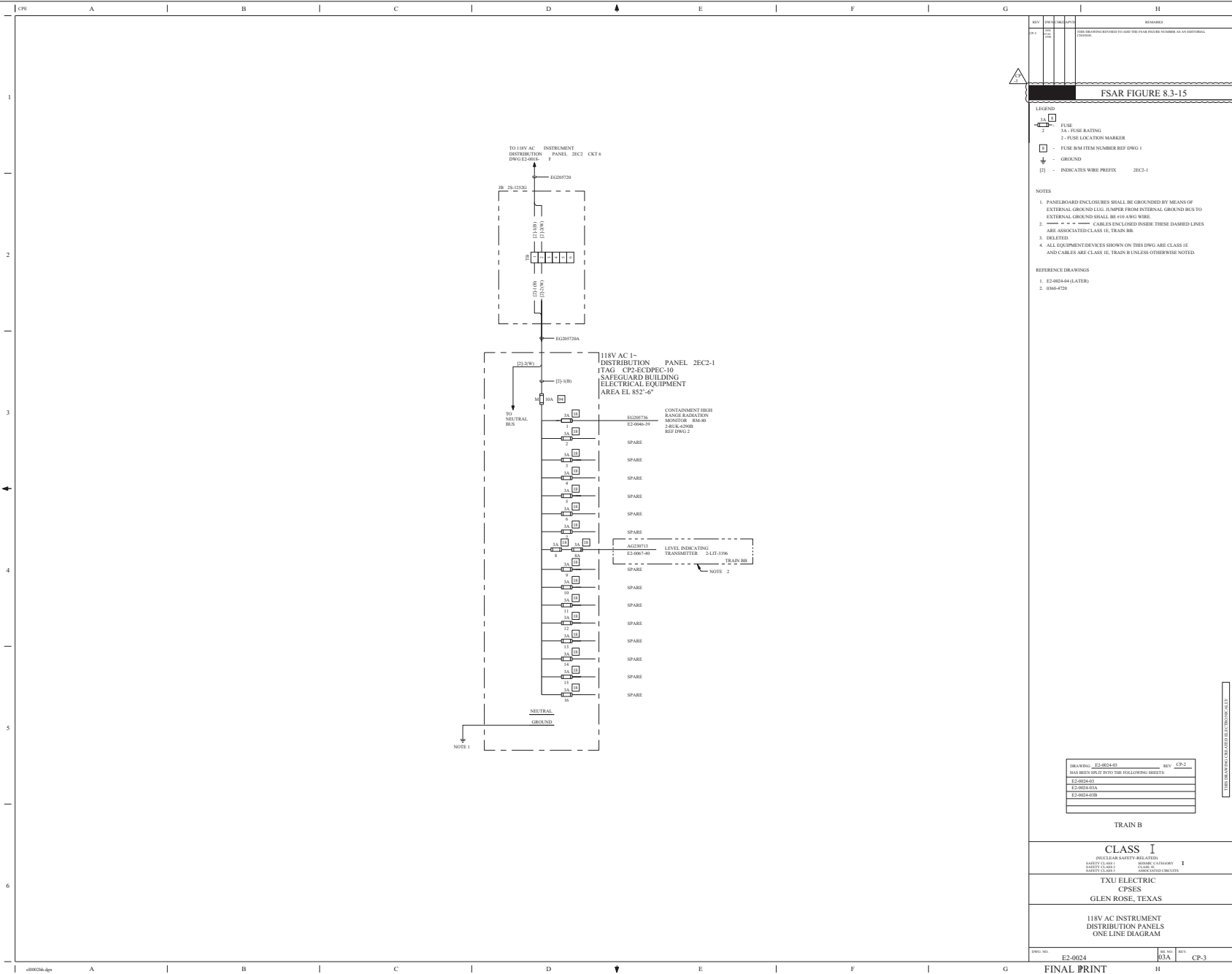
**CLASS I**

(NUCLEAR SAFETY RELATED)

SAFETY CLASS 1	SAFETY CLASS 2	SAFETY CLASS 3	SAFETY CLASS 4
SAFETY CLASS 1	SAFETY CLASS 2	SAFETY CLASS 3	SAFETY CLASS 4

TXU ELECTRIC  
CPSES  
GLEN ROSE, TEXAS

118V AC  
INSTRUMENT FUSED DISTRIBUTION PANEL  
ONE LINE DIAGRAM



REV	DATE	BY	CHKD	APPV	DESCRIPTION
1					ISSUED FOR CONSTRUCTION

**FSAR FIGURE 8.3-15**

- LEGEND**
- 1A-1T FUSE
  - 2 FUSE RATING
  - 1A-1T FUSE LOCATION MARKER
  - 1 FUSE ITEM NUMBER REF DWG 1
  - ↓ GROUND
  - (1) INDICATES WIRE PREFIX 2EC2-1

- NOTES**
1. PANELBOARD ENCLOSURES SHALL BE GROUNDED BY MEANS OF EXTERNAL GROUNDING RIBBON FROM INTERNAL GROUND BUS TO EXTERNAL GROUND SHALL BE #10 AWG WIRE.
  2. CABLES ENCLOSED INSIDE THESE DASHED LINES ARE ASSOCIATED CLASS E, TRAIN B.
  3. DELETED.
  4. ALL EQUIPMENT DEVICES SHOWN ON THIS DWG ARE CLASS E AND CABLES ARE CLASS E, TRAIN B UNLESS OTHERWISE NOTED.

- REFERENCE DRAWINGS**
1. E2-0024-04 (LATER)
  2. 0306-070

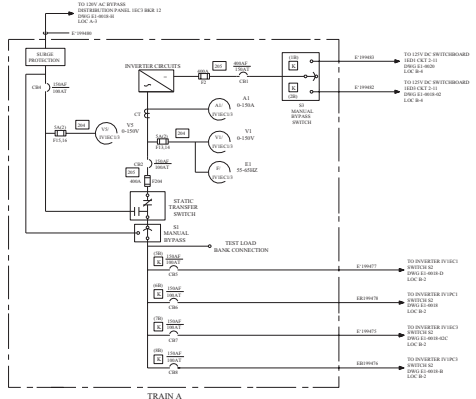
DRAWING: E2-0024-01	REV: CP-2
HAS BEEN UP-DATE TO THE FOLLOWING SHEETS:	
E2-0024-01	
E2-0024-01A	
E2-0024-01B	

TRAIN B

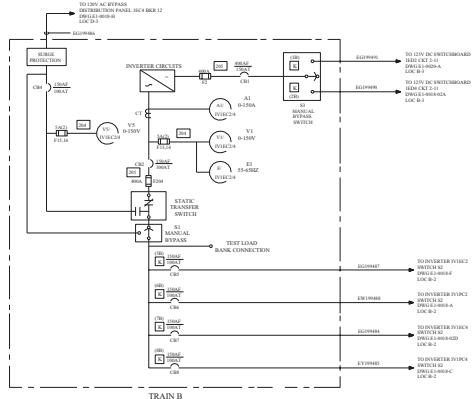
**CLASS I**  
INCLUDE SAFETY RELATED  
SAFETY CLASS I  
SAFETY CLASS I  
SAFETY CLASS I

TXU ELECTRIC  
CPSES  
GLEN ROSE, TEXAS

118V AC INSTRUMENT  
DISTRIBUTION PANELS  
ONE LINE DIAGRAM



INSTALLED SPARE STATIC  
INVERTER IV1EC1/3  
10KVA  
ELECTRIC CONTROL WELDING 11.767" 4P  
REF: 100001-10  
NOTE 1



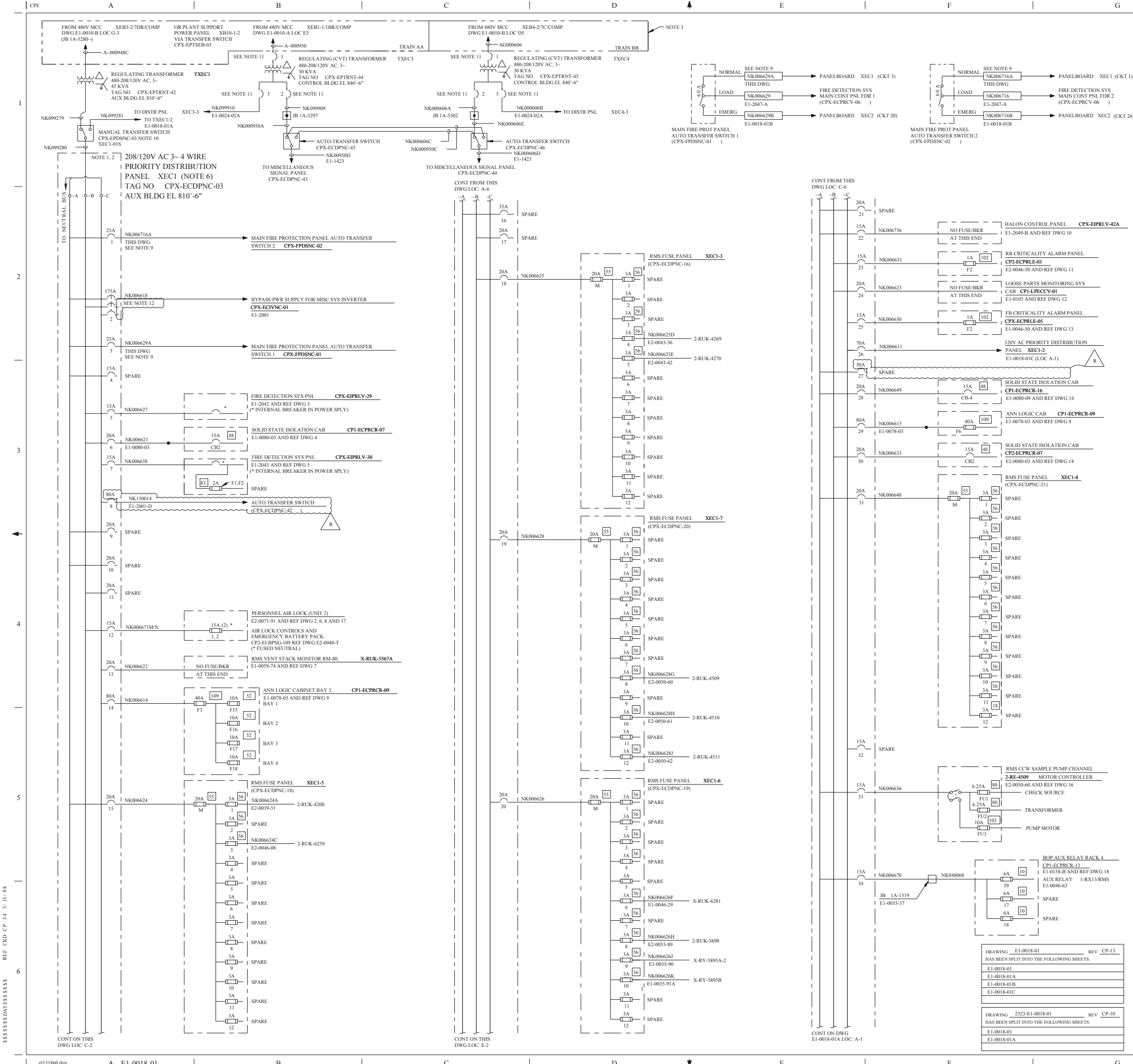
INSTALLED SPARE STATIC  
INVERTER IV1EC2/4  
10KVA  
ELECTRIC CONTROL WELDING 11.767" 4P  
REF: 100001-10  
NOTE 1

FSAR FIGURE 8.3-15A

- LEGEND
- - - CIRCUIT BREAKER
  - 1 - CIRCUIT BREAKER FRAME SIZE
  - AT - CIRCUIT BREAKER TOP RATING
  - 1 - CIRCUIT NUMBER
- FUSE
  - EA - FUSE RATING
  - FUSE LOCATION MARKER
  - FUSE BA ITEM NUMBER REF DWG. 6
- VOLTMETER
  - ADMETER
  - FREQUENCY METER
- KICK KEY INTERLOCK
  - (06) - LOCK NUMBER
- MANUAL BYPASS SWITCH  
MARK BEFORE BREAK, 1 POSITION
  - MANUAL BYPASS SWITCH  
BREAK BEFORE MARK, 3 POSITION

- NOTES
1. ALL EQUIPMENT ON THIS DRAWING IS CLASS 1E TRAIN A OR TRAIN B AS NOTED.
  2. PROGRAMMING AND PROGRAM TESTS FOR OPERATION OF INSTALLED SPARE INVERTER ARE STATED IN DWD 8140 (10P AC INVERTER FOR POWER BYPASS SYSTEM).
- REFERENCE DRAWINGS
1. 10-10001 MW 1.3
  2. 10-10001 MW 1
  3. 10-10001 MW 1
  4. 10-10001 MW 1.2
  5. 10-10001 MW 1
  6. 10-10001 MW 1

<b>CLASS 1</b> (OVERALL SAFETY RELIABILITY)	
SAFETY CLASS: 1	SAFETY CATEGORY: 1
SAFETY CLASS: 1	CLASS: 1
SAFETY CLASS: 1	SAFETY RELIABILITY: 1
TXU ELECTRIC CPSES GLEN ROSE, TEXAS	
118V AC INSTRUMENT BUS DISTRIBUTION ONE LINE DIAGRAM	



REV	DATE	BY	CHKD	APPV	REMARKS
CP-49	06-12-2001				THIS DRAWING REVISYD TO INCORPORATE DESIGN CHANGE FDA 2014-000079-02-00 PER NC-0008-14-000079-02-00

FSAR FIGURE 8.3-15A

**LEGEND:**

- 15A - CIRCUIT BREAKER 1-POLE
- 15A - CIRCUIT BREAKER RATING
- 1 - CIRCUIT NUMBER
- CIRCUIT BREAKER 3-POLE
- 6A 10/39 - FUSE
- 6A - FUSE RATING
- 39 - FUSE LOCATION MARKER
- 10 - FUSE B/M ITEM NUMBER REF DWG 21
- DISCONNECT SWITCH
- INDICATES SPLICE (SPLICE PER 2323-ES-100)

**NOTES:**

1. INCOMING LUGS SHALL BE MOUNTED AT THE TOP OF PANEL.
2. DISTRIBUTION PANEL IS SEISMIC CATEGORY 1, NON-CLASS 1E.
3. --- ALL EQUIPMENT/DEVICES AND CABLES INSIDE THESE DASHED LINES ARE CLASS 1E, TRAIN AA OR BB, AS NOTED. ALL OTHER EQUIPMENT/DEVICES AND CABLES ARE NON-SAFETY RELATED.
4. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE THERMAL MAGNETIC.
5. DELETED
6. TOTAL LOAD ON THIS PANEL IS TO THE FULL CAPACITY OF TRANSFORMER CPX-EPTINT-42. NO MORE LOAD SHALL BE ADDED TO THIS PANEL. REFERENCE CALC NUMBER EE-1E-XEB3-2.
7. DELETED
8. DELETED
9. SPARE THE RED CONDUCTOR ON CABLE NK006716A AND NK00629A.
10. TRANSFER SWITCH CPX-EPSDNC-03 SHALL BE ALIGNED TO TRANSFORMER TXEC1/2 ONLY DURING MAINTENANCE OF TRANSFORMER TXEC1 UNDER PROCEDURAL CONTROL. AT NO TIME SHALL BOTH TRANSFER SWITCHES CPX-EPSDNC-03 AND CPX-EPSDNC-04 BE ALIGNED TO TRANSFORMER TXEC1/2.
11. CIRCUIT BREAKER IS SUPPLIED WITH TRANSFORMER, SEE REFERENCE DRAWING 22.
12. CIRCUIT BREAKER IS A 3-POLE BREAKER. CABLE NK006618 IS CONNECTED TO PHASE A ONLY.

**REFERENCE DRAWINGS:**

1. 771574 SH 1 MN CONTROL PNL SCHEMATIC DIAGRAM
2. VE2-74-2428-120 SCHEMATIC UNIT 2 PERSONNEL AIR LOCK
3. 771567-01 MODEL 8088 LOCAL CONTROL PANEL CPX-EIPRLV-29
4. E-302714-01 SH 4 WIRING DIAGRAM S/S CAB LOCAL CONTROL PNL CPX-EIPRLV-30
5. 771569-01 LOCAL CONTROL PNL CPX-EIPRLV-30
6. VE2-74-2428-120 SCHEMATIC UNIT 2 PERSONNEL AIR LOCK SH A
7. 0353-1720 SH 1 CONN DIAG GAS OFFLINE MONITOR
8. 74-2428-0131 WIRING DIAG UNIT 2 PERSONNEL AIR LOCK
9. 80074 SH 1 ANNUN PWR PANEL ASSEMBLY CUSTOMER EXTERNAL PWR/PB CONTROL CONNECTIONS
10. E-81388-15-C CONTROL PANEL INTERNAL WIRING UNIT 1 AND 2 CABLE SPREADING RM
11. 0353-1553 SH 1 CONTAIN CRIT ALARM SCHEM
12. 1220030E LPM-4 INTERCONN DET AILS
13. 0353-1554 SH 1 FB CRIT ALARM SCHEM
14. E-302775-01 SH 4 SOLID STATE ISOL CAB WIRING
15. E-302775-01 SH 3 SOLID STATE ISOL CAB WIRING
16. 0353-2820 CONN DIAG LIQ MONITOR WITH PUMP
17. 74-2428-0130 WIRING DIAG UNIT 2 PERSONNEL AIR LOCK
18. E-5591 SH 1 BOP AUX RELAY RK 4
19. 53920E SH 1 FIRE PROTEC SYS SCHEM AND INTERCONN DIAG SINGLE ZONE DETECTION
20. DELETED
21. E1-0024-04 DEVICE LEVEL ONE LINE DIAGRAM FUSE/BREAKER BILL OF MATERIAL
22. 406319-1 CIRCUIT DIAGRAM SERIES 700

CLASS I

(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1      SEISMIC CATEGORY 1  
SAFETY CLASS 2      CLASS 1E  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

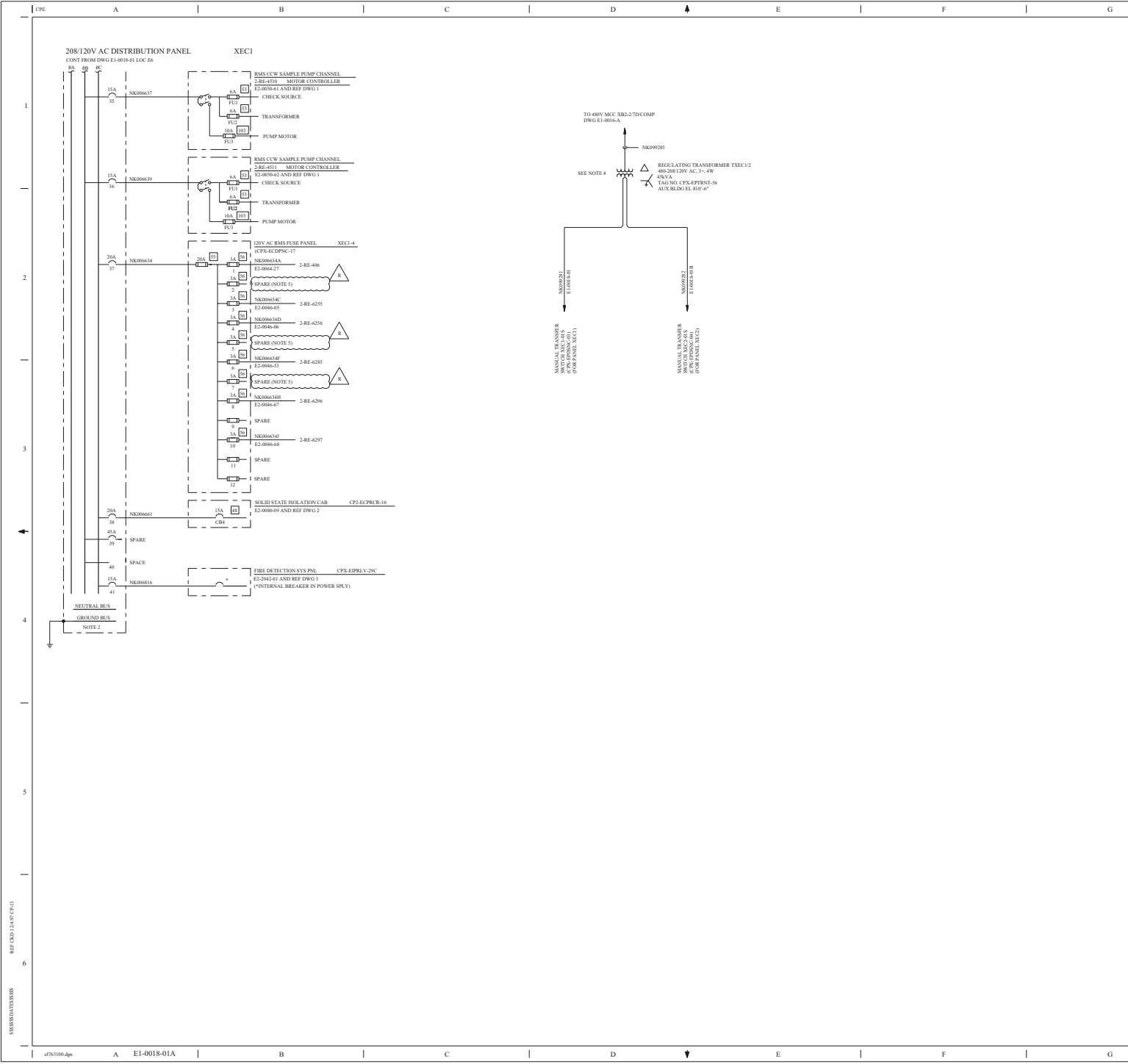
208/120V AC  
ONE LINE DIAGRAM

DRAWING E1-0018-01      REV CP-13 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS: E1-0018-01 E1-0018-01A E1-0018-01B E1-0018-01C	DRAWING 2323-E1-0018-01      REV CP-10 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS: E1-0018-01 E1-0018-01A
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DWG. NO. E1-0018      SHEET NO. 01      REV. CP-49

REF. CHD. CP. 3.4. 3/13/98

THIS DRAWING CANNOT BE ELECTRONICALLY



REV	DATE	BY	CHKD	APPV	REMARKS
01A					THIS DRAWING HAS BEEN REVISED TO REFLECT THE DESIGN CHANGE 2024.09.05/07.01/08 FOR PER. NO. 4008-00-0001.01.00

**FSAR FIGURE 8.3-15A**

**LEGEND**

- 15A - CIRCUIT BREAKER 1-POLE
- 15A - BREAKER RATING
- 1 - CIRCUIT NUMBER
- 3A - FUSE
- 3A - FUSE RATING
- 1 - FUSE LOCATION MARKER
- 3A - FUSE ITEM NUMBER REF DWG 4
- DISCONNECT SWITCH
- INDICATES SPLICE (SPLICE PER 2123-ES-100)

**NOTES**

- DISTRIBUTION PANEL IS SEISMIC CATEGORY 1, NON-CLASS IIE.
- EQUIPMENT GROUND BUS SHALL BE INSTALLED IN THE FIELD (B.M. E1-1000-307 ITEM X-35A).
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE THERMAL MAGNETIC.
- THIS TRANSFORMER SHALL NOT BE CONNECTED TO BOTH PANEL XEC1 AND XEC2 SIMULTANEOUSLY.
- THE FOLLOWING CABLES ARE SPARED IN RMS FUSE PANEL AS SHOWN BELOW:  

CABLE No.	PANEL No.
SP00634B	XEC1-4
SP00634E	XEC1-4
SP00634G	XEC1-4

**REFERENCE DRAWINGS**

- 4005-2420
- E-302775-01 SH 3
- 521052 SH 1, 711575 SH 1
- E1-0024-04

DRAWING: E1-0018-01A	REV: CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0018-01D	
E1-0018-01E	
E1-0018-01F	
E1-0018-01G	
E1-0018-01H	

DRAWING: E1-0018-01	REV: CP-13
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0018-01	
E1-0018-01A	
E1-0018-01B	
E1-0018-01C	

DRAWING: 2123-E1-0018-01	REV: CP-10
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E1-0018-01	
E1-0018-01A	

**NON-SAFETY**

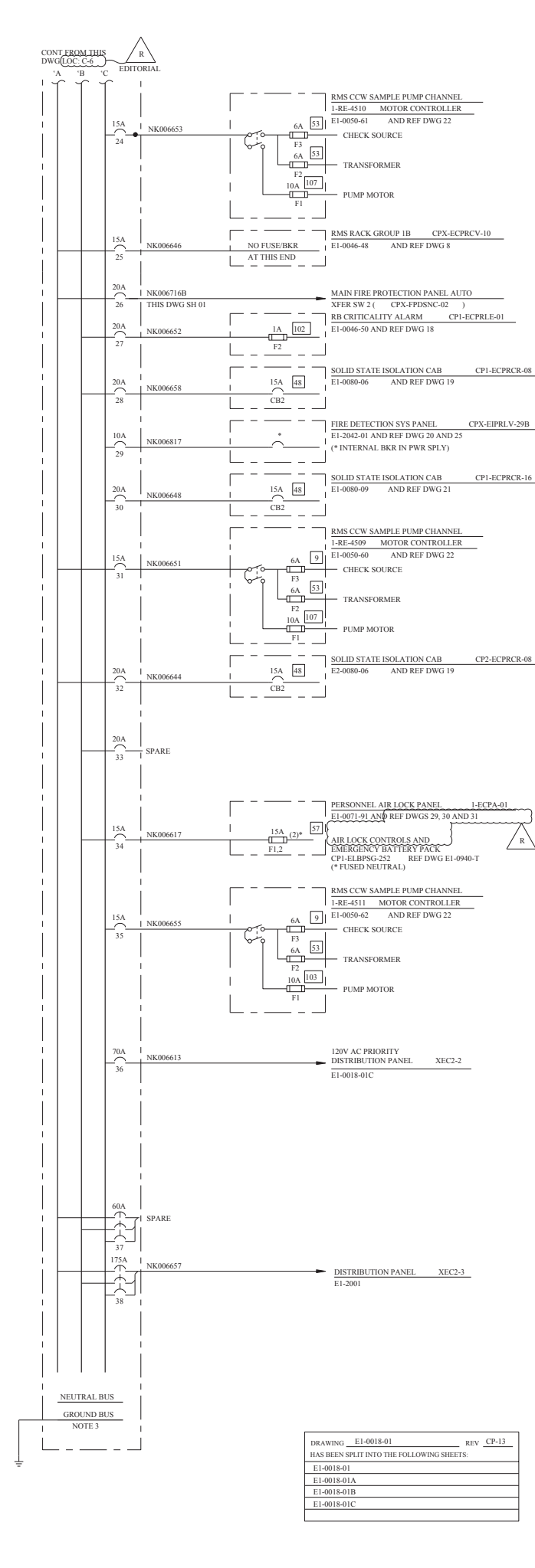
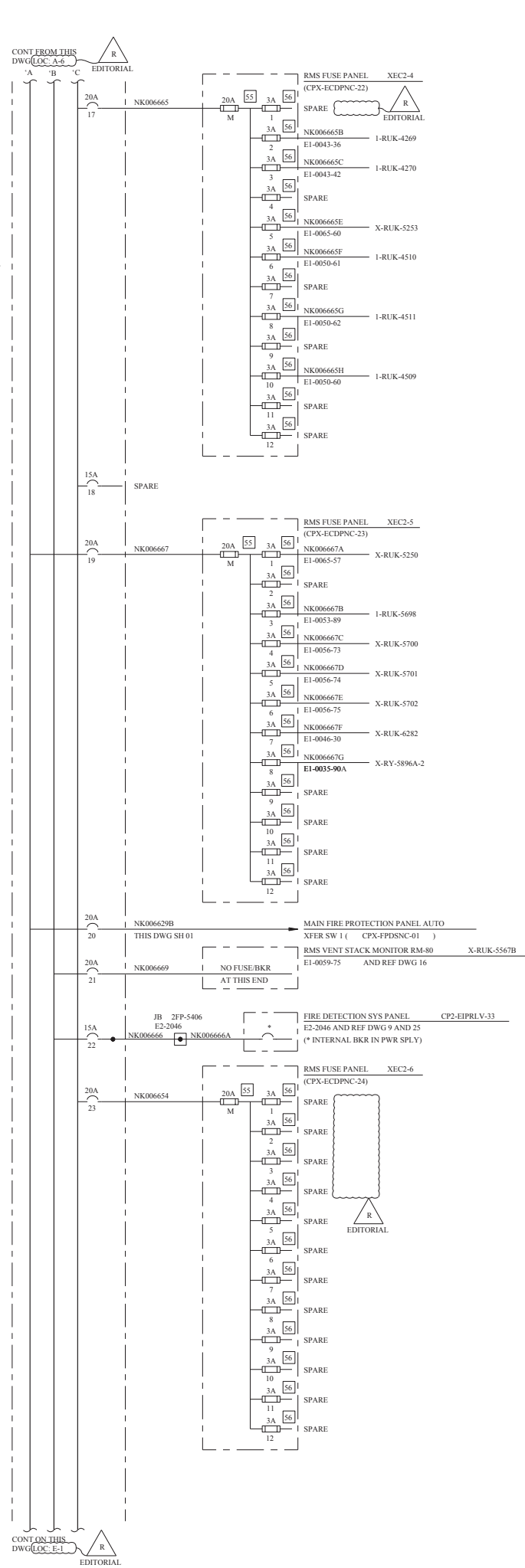
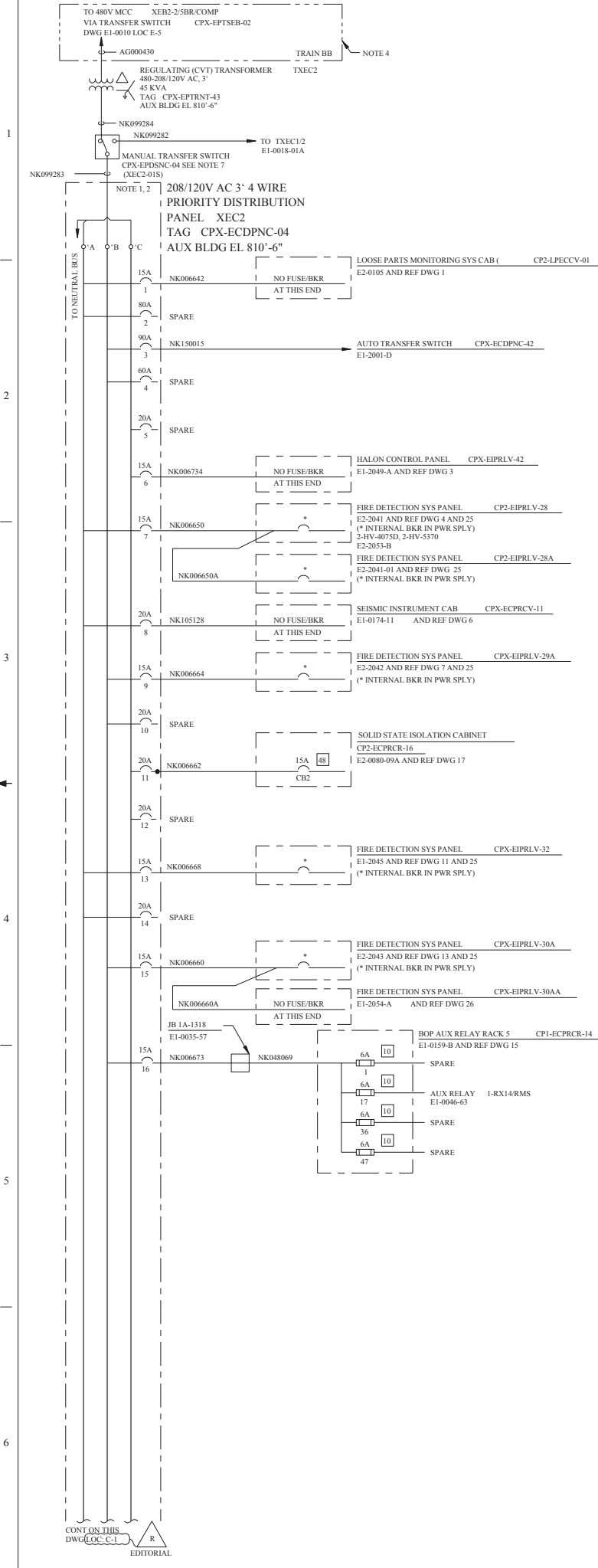
TXU ENERGY  
CPSES  
GLEN ROSE, TEXAS

208/120V AC  
ONE LINE DIAGRAM

DRW. NO. E1-0018	REV. 01A	REV. CP-16
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SUBSTITUTES/ISSUES  
REF. CSD 13497 CP-13

THIS DRAWING IS A DESIGN DOCUMENT



**REV** | **DWN** | **CHK** | **APPV** | **REMARKS**

CP-31	SM 10-02	DE 04-01	1000	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2008-002212-01-00 PER 98-0011-08-002212-01-00 EDITORIAL CHANGES AS NOTED.
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**FSAR FIGURE 8.3-15A**

**LEGEND**

- 1 - CIRCUIT BREAKER 1-POLE
- 15A - CIRCUIT BREAKER RATING
- 1 - CIRCUIT NUMBER
- 1 - CIRCUIT BREAKER 3-POLE
- 6A 10 - FUSE
- 6A - FUSE RATING
- 1 - FUSE LOCATION MARKER
- 10 - FUSE B/M ITEM NUMBER REF DWG 28
- DISCONNECT SWITCH
- INDICATES SPLICE PER SPEC 2323-ES-100

**NOTES**

- INCOMING LUGS SHALL BE MOUNTED AT THE BOTTOM OF PANEL.
- DISTRIBUTION PANEL IS SEISMIC CATEGORY 1, NON-CLASS 1E.
- EQUIPMENT GROUND BUS SHALL BE INSTALLED IN THE FIELD (B/M E1-1800-367 ITEM X-35A).
- ALL EQUIPMENT/DEVICES AND CABLES INSIDE THESE DASHED LINES ARE CLASS 1E. ALL OTHER EQUIPMENT/DEVICES AND CABLES ARE NON-SAFETY RELATED.
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE THERMAL MAGNETIC.
- DELETED
- TRANSFER SWITCH CPX-EPDNC-04 SHALL BE ALIGNED TO TRANSFORMER TXEC1/2 ONLY DURING MAINTENANCE OF TRANSFORMER TXEC2 UNDER PROCEDURAL CONTROL. AT NO TIME SHALL BOTH TRANSFER SWITCHES CPX-EPDNC-03 AND CPX-EPDNC-04 BE ALIGNED TO TRANSFORMER TXEC1/2.

**REFERENCE DRAWINGS**

1. 1005924J	LPMS INTERCONN DETAILS-FRAMES 1 AND 2
2. DELETED	
3. E-81388-15-C	CONTROL PANEL INTERNAL WIRING UNIT 1 AND 2 CABLE SPREADING RM
4. VE1-771565-01	LOCAL CONTROL PANEL CP1-EIPRLV-28
5. DELETED	
6. 503135 SH 1	ASSEMBLY CABINET OUTLINE
7. VE1-771568-01	LOCAL CONTROL PANEL SCHEM AND INTERCONN DIAGRAM
8. 0353-0580 SH 1	CUSTOMER CONNECTION DIAGRAM CONTROL ROOM EQUIP RACK 2
9. 771564 SH 1	LOCAL CONTROL PANEL INTER
10. DELETED	
11. VE1-771573-01	MODEL 8094 LOCAL CONTROL PANEL CPX-EIPRLV-32 SCHEMATIC AND INTERCONN DIAGRAM
12. DELETED	
13. VE1-771570-01	MODEL 8091 LOCAL CONTROL PANEL CPX-EIPRLV-30A
14. DELETED	
15. E-5592 SH 1	BOP AUX RELAY RK 5
16. 0353-1820 SH 1	CONNECTION DIAGRAM GAS SAMPLER WITH PUMP
17. E-302775-01 SH 3	SOLID STATE ISOL CAB WIRING
18. 0353-1553 SH 1	CONTAIN CRIT ALARM SCHEM
19. E-302774-01 SH 4	WIRING DIAGRAM S/S CAB
20. VE1-52105E1-01	SCHEMATIC AND INTERCONN AR33 SYS
21. E-302775-01 SH 4	SOLID STATE ISOL CAB WIRING
22. 0353-2820	CONN DIAG LIQ MON. 5" PB WITH PUMP
23. DELETED	
24. 803650 SH 1, 803647	WIRING DIAGRAM PWR DISTR PNL POWER DIST PANEL ASSY
25. 771575 SH 1	POWER SUPPLY
26. VE1-54522E SH 1	FIRE PROTECTION SYSTEM SCHEMATIC AND INTERCONNECTION
27. 53920E-01	FIRE PROTECTION SYSTEM SCHEMATIC AND INTERCONNECTION DIAGRAM SINGLE ZONE DETECTION AND DAMPER CONTROL
28. E1-0024-04	DEVICE LEVEL ONE LINE DIAGRAM FUSE/BREAKER BILL OF MATERIAL
29. 74-2427-0120	SCHEMATIC UNIT 1 PERSONNEL AIR LOCK
30. 74-2427-0130	WIRING DIAG UNIT 1 PERSONNEL AIR LOCK
31. 74-2427-0131	WIRING DIAG UNIT 1 PERSONNEL AIR LOCK

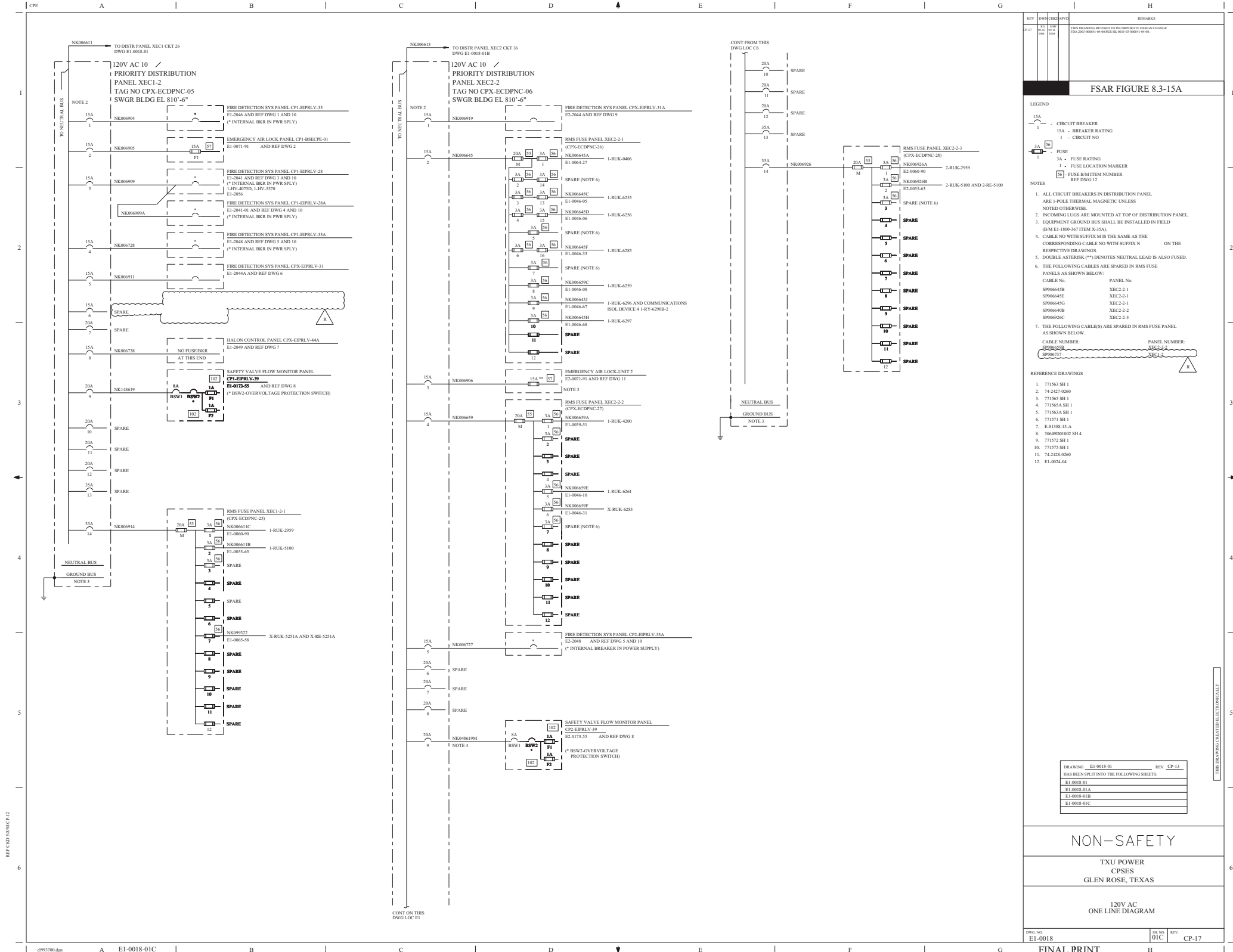
**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT CPNPP**  
GLEN ROSE, TEXAS

**208/120V AC ONE LINE DIAGRAM**

DWG NO: **E1-0018** | SHE NO: **01B** | REV: **CP-31**

DRAWING E1-0018-01 REV CP-13 HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:  
E1-0018-01  
E1-0018-01A  
E1-0018-01B  
E1-0018-01C



REV	DATE	BY	CHKD	APPV	REMARKS
01	08/01/01				THIS DRAWING REVISION TO INCORPORATE DESIGN CHANGE FDA 2001-00080-01-00 PER DL 0011-01-00041-00-05

**FSAR FIGURE 8.3-15A**

- LEGEND**
- 15A - CIRCUIT BREAKER
  - 15A - BREAKER RATING
  - 1 - CIRCUIT NO
  - 3A - FUSE
  - 3A - FUSE RATING
  - 1 - FUSE LOCATION MARKER
  - 56 - FUSE ITEM NUMBER REF DWG 12

- NOTES**
1. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 1-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE
  2. INCOMING LUGS ARE MOUNTED AT TOP OF DISTRIBUTION PANEL
  3. EQUIPMENT GROUND BUS SHALL BE INSTALLED IN FIELD (B/M E1-100-54 ITEM 5.35A)
  4. CABLE NO WITH SUFFIX M IS THE SAME AS THE CORRESPONDING CABLE NO WITH SUFFIX N ON THE RESPECTIVE DRAWINGS.
  5. DOUBLE ASTERISK (\*\*) DENOTES NEUTRAL LEAD IS ALSO FUSED.
  6. THE FOLLOWING CABLES ARE SPARED IN RMS FUSE PANELS AS SHOWN BELOW:

CABLE No.	PANEL No.
SP00645B	XEC2-1
SP00645C	XEC2-1
SP00645D	XEC2-1
SP00645E	XEC2-2
SP00626C	XEC2-3

7. THE FOLLOWING CABLE(S) ARE SPARED IN RMS FUSE PANEL AS SHOWN BELOW:

CABLE NUMBER:	PANEL NUMBER:
SP00650B	XEC2-2
SP00673F	XEC1-2

- REFERENCE DRAWINGS**
1. 71563 SH 1
  2. 74-247-0360
  3. 71565 SH 1
  4. 71565A SH 1
  5. 71563A SH 1
  6. 71571 SH 1
  7. E-81388-15-A
  8. 306#D01002 SH 4
  9. 71572 SH 1
  10. 71575 SH 1
  11. 74-2428-0260
  12. E1-0024-04

DRAWING	E1-0018-01	REV	CP-13
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0018-01			
E1-0018-01A			
E1-0018-01B			
E1-0018-01C			

**NON-SAFETY**

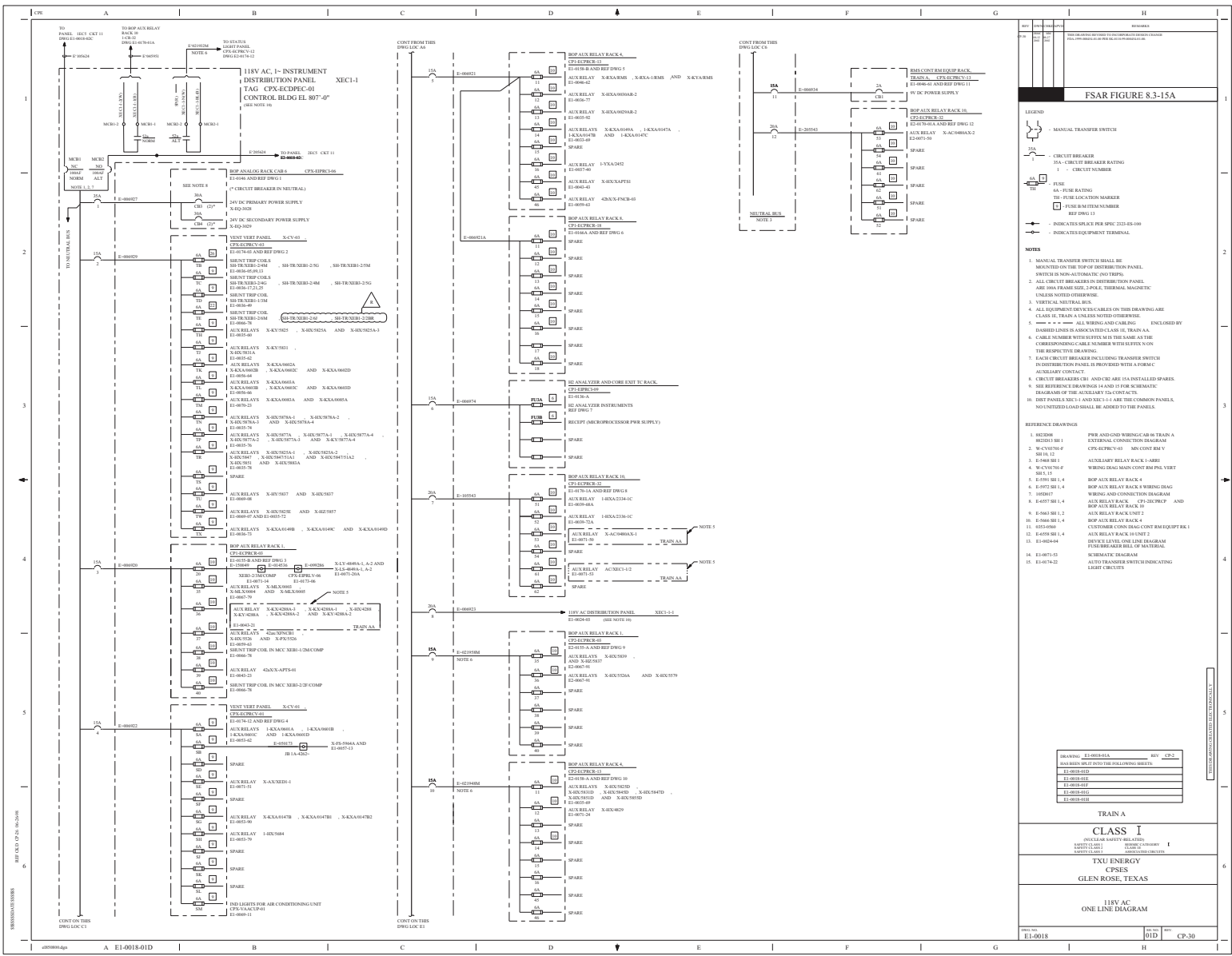
TXU POWER  
CPSES  
GLEN ROSE, TEXAS

120V AC  
ONE LINE DIAGRAM

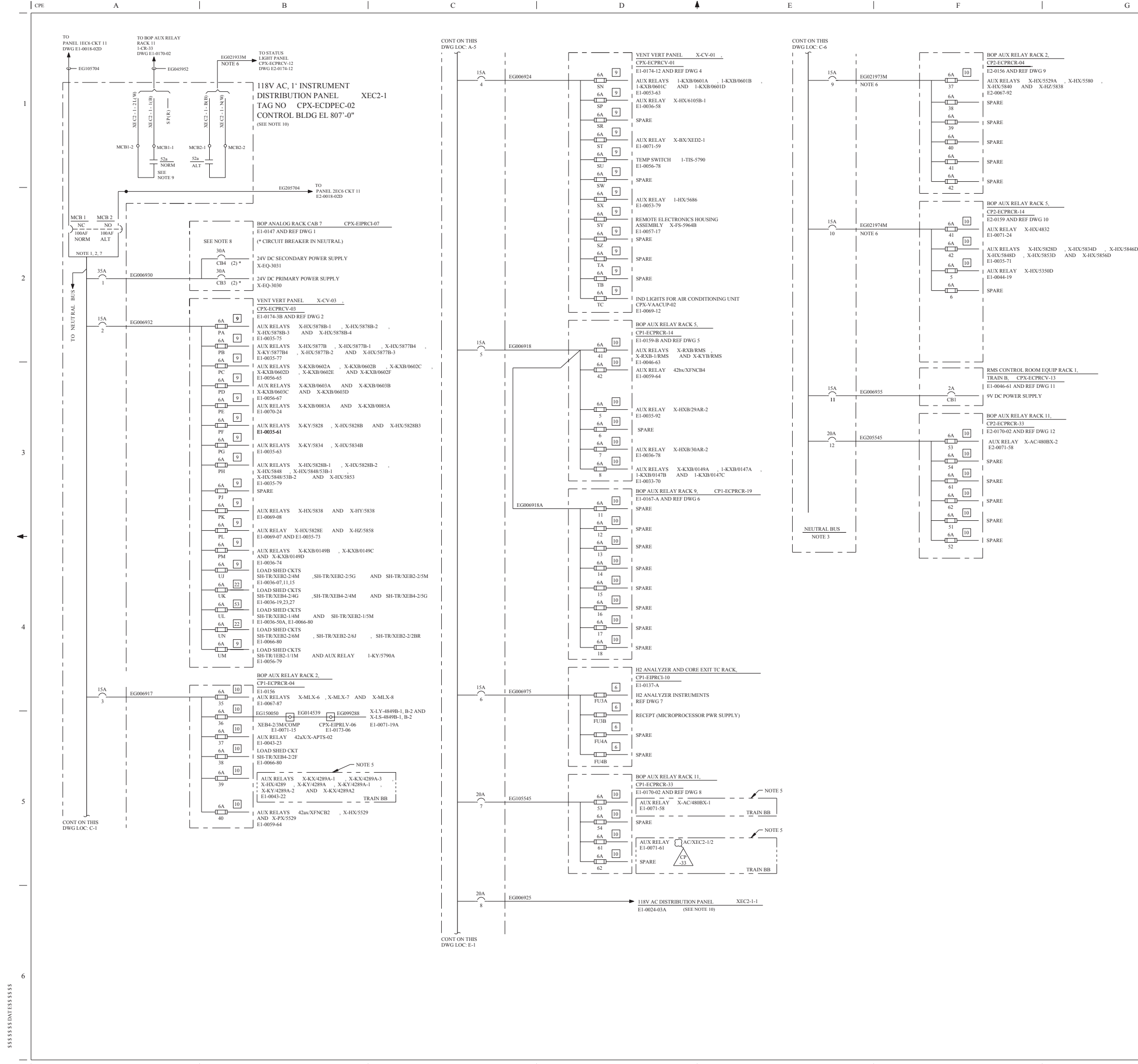
REF: CDS 3306C 6/2

THIS DRAWING CANNOT BE REPRODUCED





REV		REV		REV	
1	01/01	1	01/01	1	01/01
FSAR FIGURE 8.3-15A					
<p>LEGEND</p> <p>MANUAL TRANSFER SWITCH</p> <p>CIRCUIT BREAKER</p> <p>CIRCUIT BREAKER RATING</p> <p>FUSE</p> <p>FUSE RATING</p> <p>FUSE LOCATION MARKER</p> <p>FUSE RATED NUMBER</p> <p>FUSE RATED NUMBER</p> <p>INDICATES 118V SPN 225-65-00</p> <p>INDICATES EQUIPMENT TERMINAL</p>					
<p>NOTES</p> <ol style="list-style-type: none"> <li>MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE TOP OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC CONTROL.</li> <li>ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 30A FRAME SIZE, 2-POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.</li> <li>VERTICAL NEUTRAL BUS.</li> <li>ALL EQUIPMENT DRIVE CABLES ON THIS DRAWING ARE CLASS II, UNLESS NOTED OTHERWISE.</li> <li>*** = ALL WIRING AND CABLES ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS II, TRAIN A.</li> <li>CABLE NUMBER WITH LETTERS IN THE NAME AT THE CORRESPONDING CABLE NUMBER WITH LETTER N ON THE RESPECTIVE DRAWING.</li> <li>EACH CIRCUIT BREAKER INCLUDING TRANSFER SWITCH IN DISTRIBUTION PANEL IS PROVIDED WITH A BREAK-AUXILIARY CONTACT.</li> <li>CIRCUIT BREAKERS ON AUXILIARY ARE INSTALLED SPARES.</li> <li>SEE REFERRED DRAWINGS A AND 11 FOR SCHEMATIC DIAGRAMS OF THE AUXILIARY 118V CONTROL DRAWING PANELS. MECS1 AND MECS2 ARE THE COMMON PANELS. NO INSTANT LOAD SHALL BE ADDED TO THE PANELS.</li> </ol>					
<p>REFERENCE DRAWINGS</p> <ol style="list-style-type: none"> <li>8-0200-001 PWR AND-ODD WIRING CAB IN TRAIN A EXTERNAL CONNECTION DIAGRAM</li> <li>8-0200-002 CPX-ECPC-01 MIN CONT RM V</li> <li>8-0200-003 AUXILIARY RELAY RACK 1-002</li> <li>8-0200-004 WIRING DIAG-MAIN CONT RM PWR VERT 001.1</li> <li>8-0200-005 SOP AUX RELAY RACK 4</li> <li>8-0200-006 SOP AUX RELAY RACK 1 WIRING DIAG</li> <li>8-0200-007 WIRING AND CONNECTION DIAGRAM</li> <li>8-0200-008 AUX RELAY RACK CPX-ECPC-01 AND SOP RELAY RACK</li> <li>8-0200-009 SOP AUX RELAY RACK UNIT 2</li> <li>8-0200-010 SOP AUX RELAY RACK 2</li> <li>8-0200-011 CUSTOMER CONNECTION DIAG-CONT RM EQUIP RACK 1</li> <li>8-0200-012 AUX RELAY RACK 10 UNIT 2</li> <li>8-0200-013 POWER LINES ONLY LINE DIAGRAM</li> <li>8-0200-014 SCHEMATIC DIAGRAM</li> <li>8-0200-015 AUTO TRANSFER SWITCH INDICATING CIRCUIT IDENTITY</li> </ol>					
<p>DRAWING: EI-0018A REV: EP2</p> <p>CLASS I</p> <p>TXU ENERGY</p> <p>CPSES</p> <p>GLEN ROSE, TEXAS</p> <p>118V AC ONE LINE DIAGRAM</p>					
REV	DATE	BY	CHKD	APPD	REV
01	01/01	01	01/01	01	01/01
02	01/01	02	01/01	02	01/01
03	01/01	03	01/01	03	01/01
04	01/01	04	01/01	04	01/01
05	01/01	05	01/01	05	01/01
06	01/01	06	01/01	06	01/01



REV	DATE	BY	CHK	APPV	REMARKS
CP-33	04/04/2011				THIS DRAWING REVISED TO INCORPORATE AN EDITORIAL CHANGE PER ALCR-2014-01010-1.

**FSAR FIGURE 8.3-15A**

**LEGEND**

- MANUAL TRANSFER SWITCH
- CIRCUIT BREAKER
- 35A - CIRCUIT BREAKER RATING
- 1 - CIRCUIT NO
- FUSE
- 6A - FUSE RATING
- PA - FUSE LOCATION MARKER
- 9 - FUSE B/M ITEM NUMBER
- REF DWG 13
- INDICATES SPLICE PER SPEC 2323-ES-100
- INDICATES EQUIPMENT TERMINAL

**NOTES**

- MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE TOP OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- VERTICAL NEUTRAL BUS.
- ALL EQUIPMENT/DEVICES/CABLES ON THIS DRAWING ARE CLASS 1E TRAIN B UNLESS NOTED OTHERWISE.
- ALL WIRING AND CABLEING ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS 1E TRAIN BB.
- CABLE NUMBER WITH SUFFIX M IS THE SAME AS THE CORRESPONDING CABLE NUMBER WITH SUFFIX N ON THE RESPECTIVE DRAWING.
- EACH CIRCUIT BREAKER INCLUDING TRANSFER SWITCH IN DISTRIBUTION PANEL IS PROVIDED WITH A FORM C AUXILIARY CONTACT.
- CIRCUIT BREAKERS CB1 AND CB2 ARE 15A INSTALLED SPARES.
- SEE REFERENCE DRAWINGS 14 AND 15 FOR SCHEMATIC DIAGRAMS OF THE AUXILIARY 52a CONTACTS.
- DIST PANELS XEC2-1 AND XEC2-1-1 ARE THE COMMON PANELS, NO UNUTILIZED LOAD SHALL BE ADDED TO THE PANELS.

**REFERENCE DRAWINGS**

8823D09 8823D14 SH 1	PWR AND GND WIRING/CAB 07 TR B EXTERNAL CONNECTION DIAGRAM
2. W-CV03701-F SH 11, 12	CPX-ECPRCV-03 WD MN CONT RM VV
3. DELETED	
4. W-CV01701-F SH 7, 14	WIRING DIAG MAIN CONT RM PNL VERT
5. E-5592-1,-4	BOP AUX RELAY RK 5 WIRING DIAG
6. E-5973-1,-4	BOP AUX RELAY RK 3, 9 INTERNAL WIRING DIAGRAM
7. 105D017	WIRING AND CONNECTION DIAGRAM
8. E-6559-1,-4	WIRING DIAG AUX RELAY RK 2 UNIT 1 BOP AUX RELAY RK 11
9. E-5664-1,-2	BOP AUX RACK 2 INTERNAL WIRING DIAG
10. E-5667-1,-4	BOP AUX RELAY RACK 5 WIRING DIAG
11. 0353-0560	CUSTOMER CONN DIAG CONT RM EQUIP RK 1
12. E-6560-1,-4	AUX RELAY RACK 11 UNIT 2
13. E1-0024-04	DEVICE LEVEL ONE LINE DIAGRAM FUSE/BREAKER BILL OF MATERIAL
14. E1-0071-61	I-SSII-2 118V AC AND BUS TIE BKR SCHEMATIC DIAGRAM
15. E1-0174-22	AUTO TRANSFER SWITCH INDICATING LIGHT CIRCUITS

**TRAIN B**

**CLASS I**  
(NUCLEAR SAFETY RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

**LUMINANT  
CPNPP  
GLEN ROSE, TEXAS**

118V AC  
ONE LINE DIAGRAM

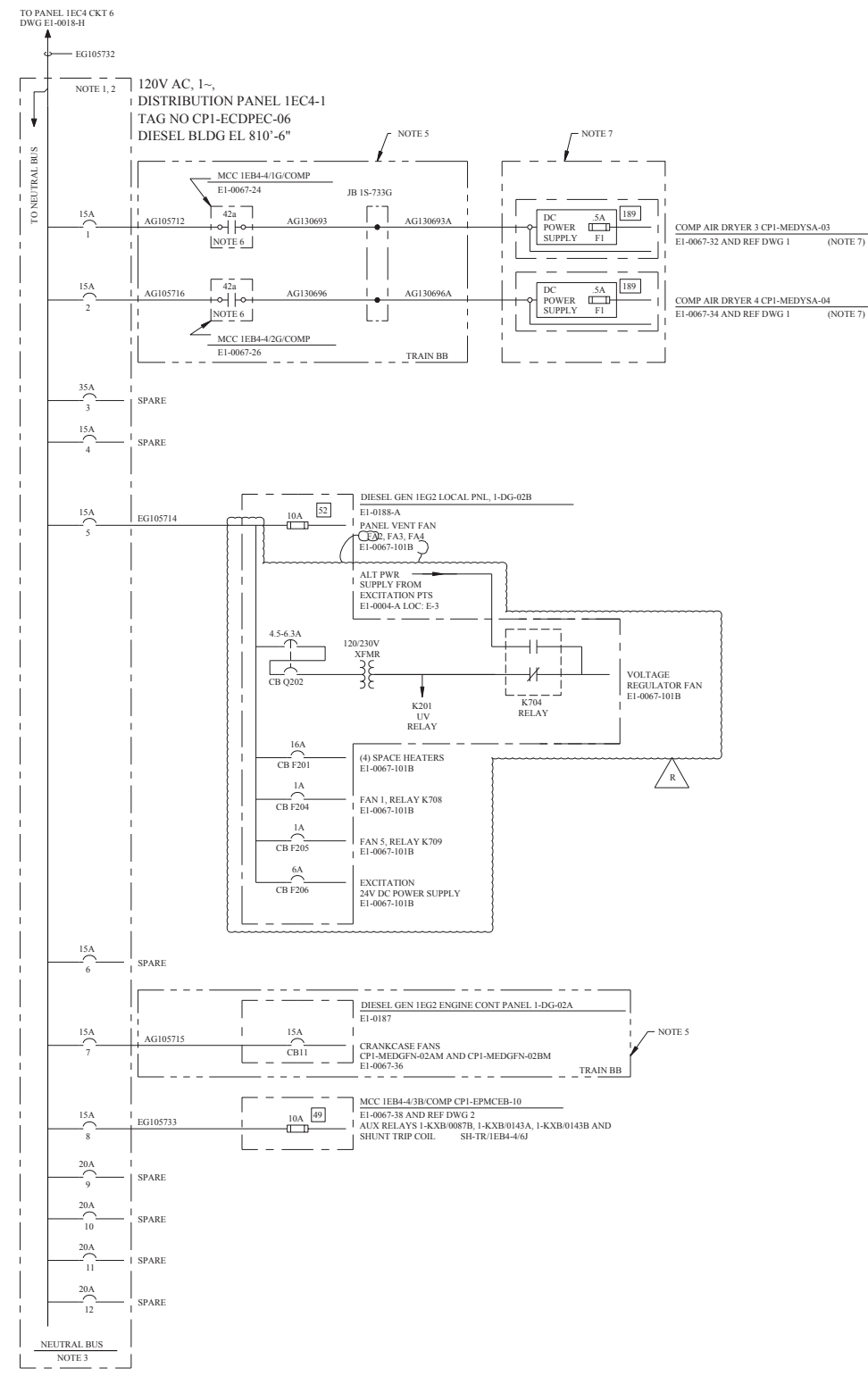
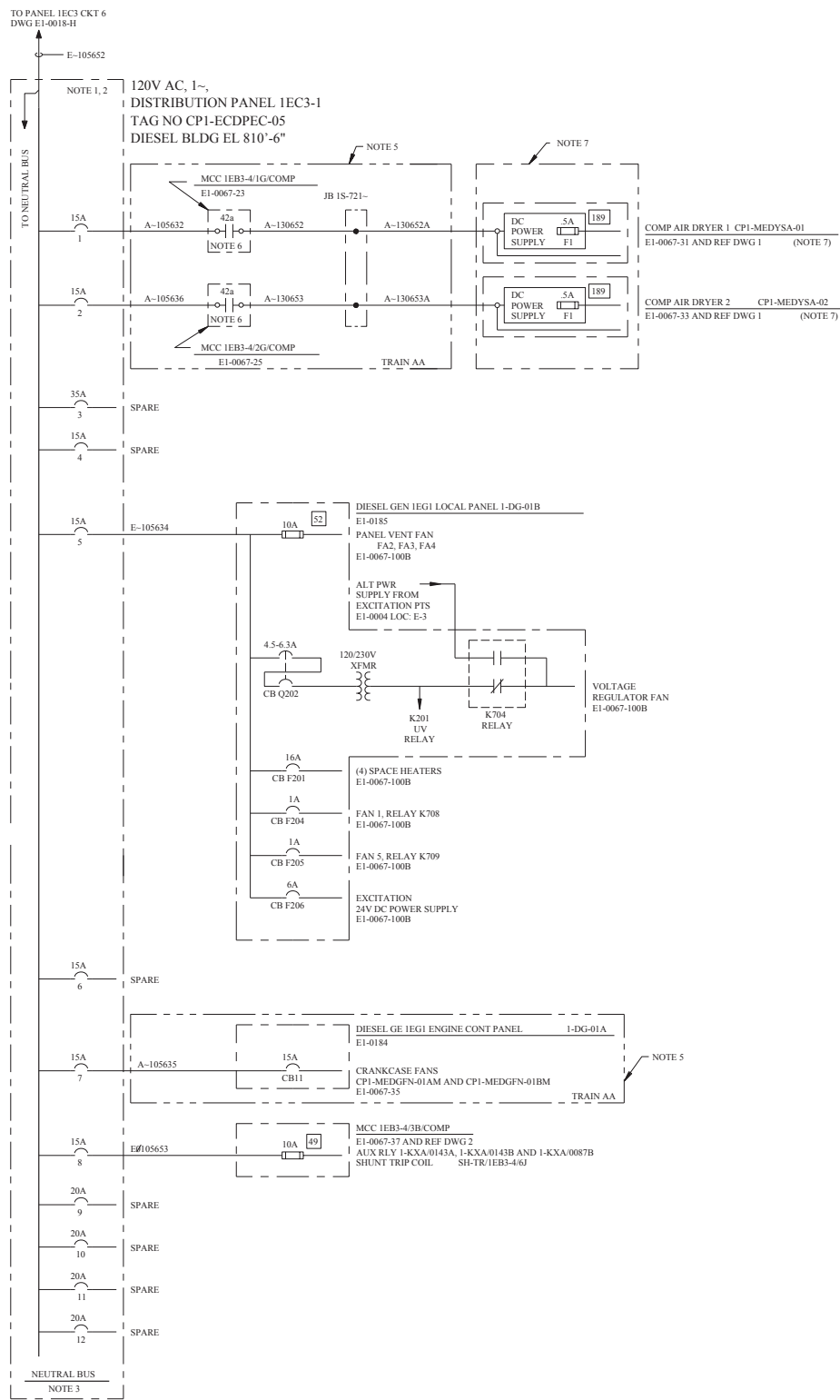
DRAWING	E1-0018-01A	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0018-01D			
E1-0018-01E			
E1-0018-01F			
E1-0018-01G			
E1-0018-01H			

DRAWING CREATED ELECTRONICALLY

DRWG NO	E1-0018	SHEET	01E	REV	CP-33
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REV	DWN	CHKD	APVD	REMARKS
CP-16	CA	DE		
10-25-2004	11-01-2004			
THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2001-001255-06-00 PER 96-0001-01-001255-06-00				

FSAR FIGURE 8.3-15A

- LEGEND
- 15A - CIRCUIT BREAKER
  - 15A - CIRCUIT BREAKER RATING
  - 1 - CIRCUIT NO
  - 10A - FUSE
  - 52 - FUSE B/M ITEM NUMBER REF DWG 3
  - INDICATES SPLICE PER 2323-ES-100.
  - INDICATES CONNECTION TO TERMINAL.

- NOTES
1. INCOMING LUGS SHALL BE MOUNTED AT THE TOP OF DISTRIBUTION PANEL.
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. VERTICAL NEUTRAL BUS.
  4. ALL EQUIPMENT/DEVICES/CABLES ON THIS DRAWING ARE CLASS 1E TRAIN A OR B AS NOTED.
  5. --- ALL WIRING AND CABLING ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS 1E TRAIN AA OR BB AS NOTED.
  6. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOADS IS PROVIDED BY OPENING THE CLASS 1E CONTACT ON SIAS.
  7. --- ALL EQUIPMENT/DEVICES INSIDE THESE DASHED LINES OR FED BY THESE CIRCUITS ARE NON-CLASS 1E.

- REFERENCE DRAWINGS
1. 104438-D2 SH 1 PNEUMATIC PRODUCTS CORP
  2. 212B7150 SH 15B-2
  3. E1-0024-04

DRAWING	E1-0018-01A	REV	CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0018-01D			
E1-0018-01E			
E1-0018-01F			
E1-0018-01G			
E1-0018-01H			

**CLASS I**  
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS 1E  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

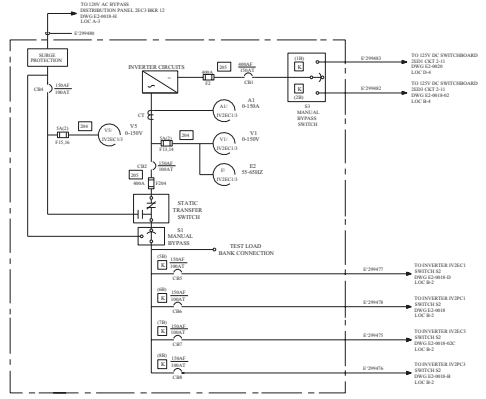
TXU POWER  
CPSES  
GLEN ROSE, TEXAS

120V AC  
ONE LINE DIAGRAM

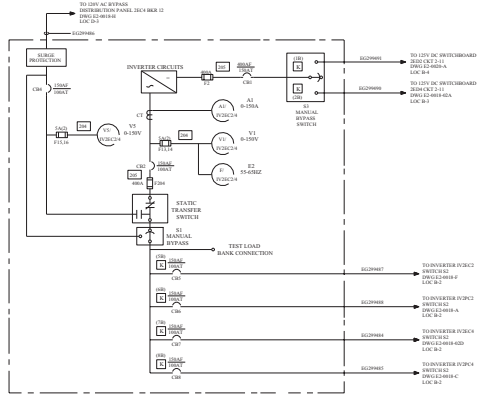
DWG NO	E1-0018	SH NO	01H	REV	CP-16
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TRAIN A

TRAIN B



INSTALLED SPARE STATIC  
INVERTER IV2C2/3  
10KVA  
TYPE: CP-RTX-08  
ELEC CONTROL, BLEND EL, 70°-0°  
RIS PANEL 17  
NOTE 2



INSTALLED SPARE STATIC  
INVERTER IV2C2/4  
10KVA  
TYPE: CP-RTX-08  
ELEC CONTROL, BLEND EL, 70°-0°  
RIS PANEL 17  
NOTE 2

**FSAR FIGURE 8.3-15A**

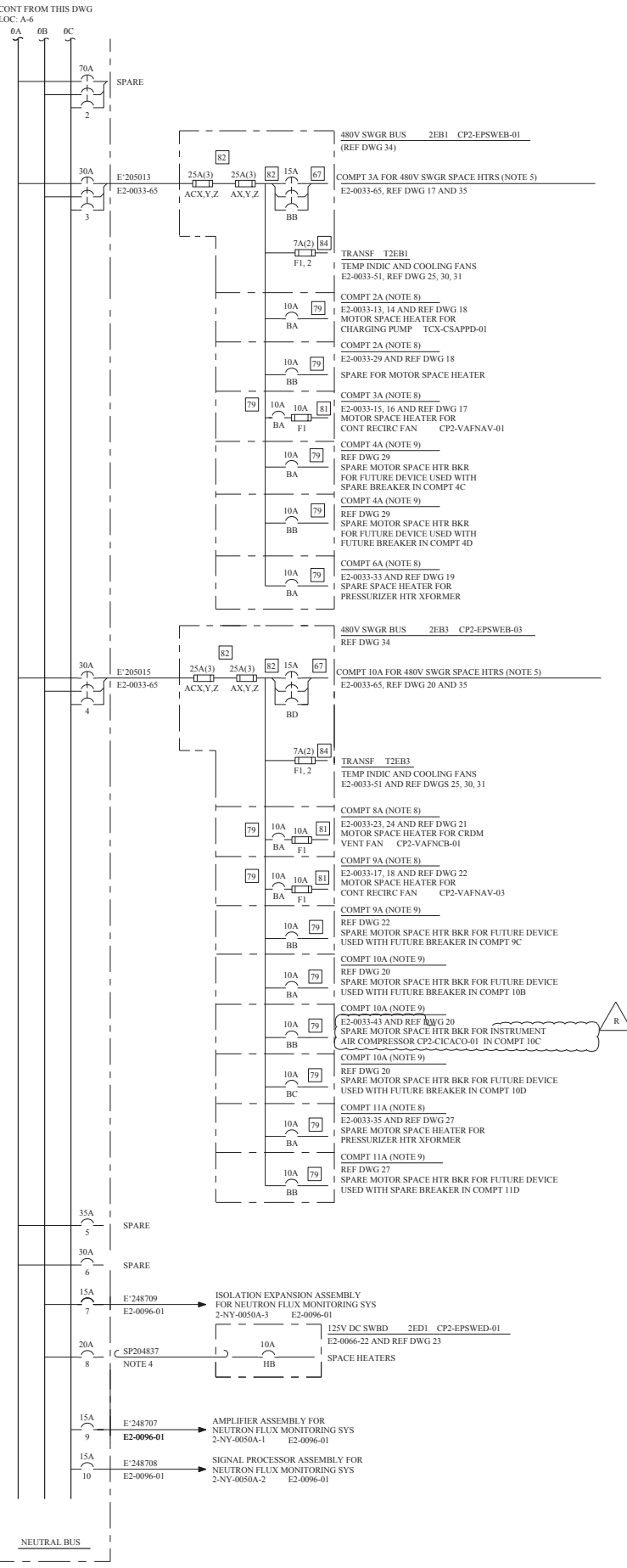
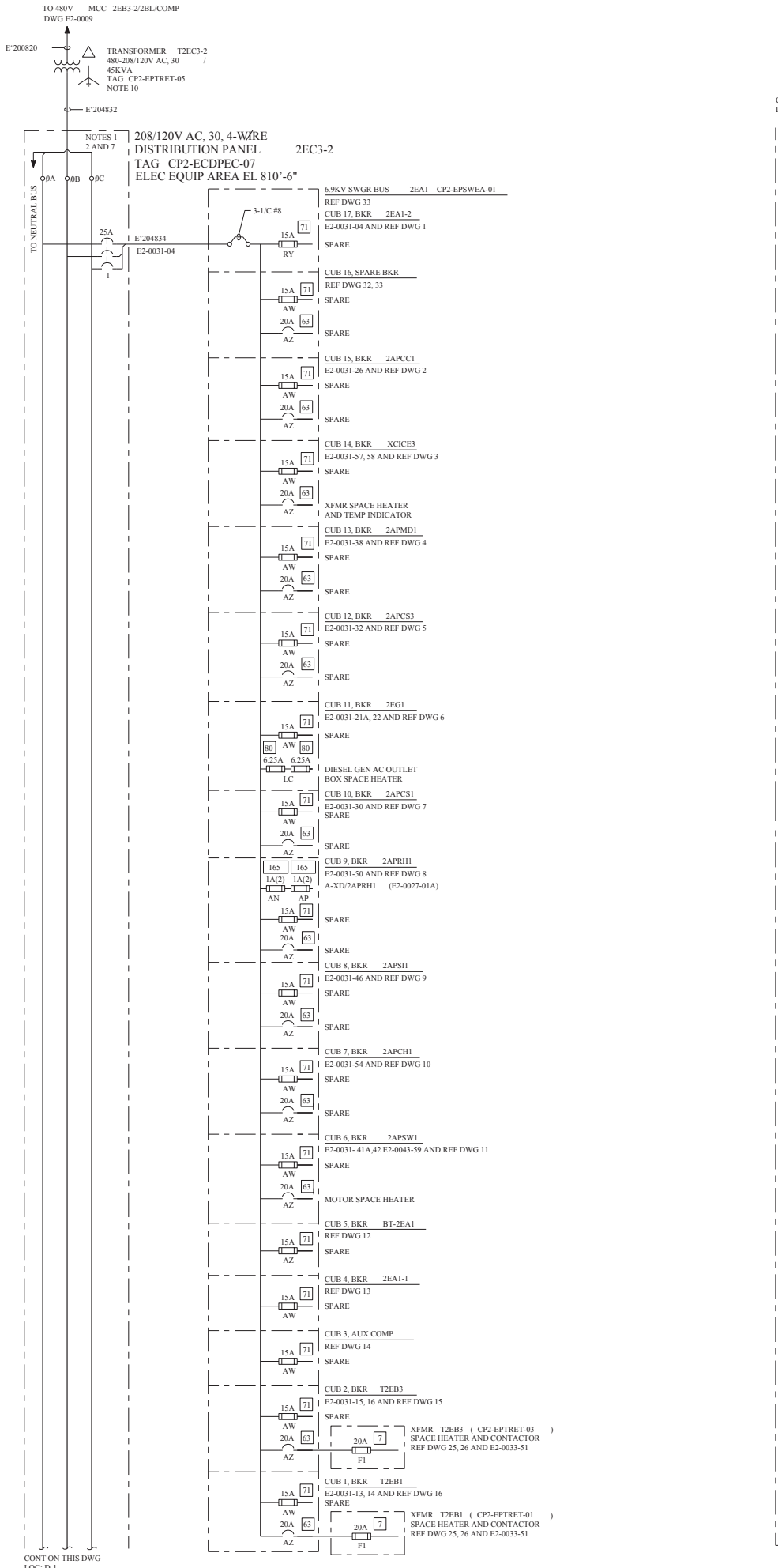
- LEGEND
- CIRCUIT BREAKER
  - CIRCUIT BREAKER FRAME SIZE
  - CIRCUIT BREAKER TRIP RATING
  - CIRCUIT NUMBER
  - FUSE
  - FUSE RATING
  - FUSE LOCATION MARKER
  - FUSE ITEM NUMBER REF DWG 6
  - VOLTMETER
  - AMMETER
  - FREQUENCY METER
  - KIOSK KEY INTERLOCK (FOR LOCK NUMBER)
  - MANUAL BYPASS SWITCH (MAKE BEFORE BREAK, 2 POSITION)
  - MANUAL BYPASS SWITCH (BREAK BEFORE MAKE, 3 POSITION)

- NOTES
1. ALL EQUIPMENT ON THIS DRAWING IS CLASS 1E
  2. EPLAN AND TRAIN B AS NOTED
  3. REQUIREMENTS AND REQUIREMENTS FOR OPERATION OF INSTALLED 200VDC INVERTER ARE LISTED IN 8.3-15B AND 8.3-15C AC UNRELIABLE POWER SUPPLY SYSTEM
- REFERENCE DRAWINGS
1. 80-0472Z 80-12
  2. 80-0472H 80-1
  3. 80-0472H 80-1
  4. 20-0452Z 80-12
  5. 20-0452Z 80-1
  6. 20-0452Z 80-1
  7. 82-0662-0

**CLASS I**  
NUCLEAR SAFETY RELATED  
SAFETY CLASS 1 - DESIGN CATEGORY I  
SAFETY CLASS 1 - DESIGN CATEGORY I  
SAFETY CLASS 1 - DESIGN CATEGORY I

**TXU ELECTRIC**  
CSRS  
GLEN ROSE, TEXAS

118V AC  
INSTRUMENT BUS DISTRIBUTION  
ONE LINE DIAGRAM



REV	DWN	CHK	APPV	REMARKS
01				THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2001-000158-08-00 PER 98-0019-01-000158-08-00

FSAR FIGURE 8.3-15A

- LEGEND
- CIRCUIT BREAKER 3-POLE
  - 70A - BREAKER RATING
  - 1 - CIRCUIT NUMBER
  - 20A - CIRCUIT BREAKER
  - 20A - CIRCUIT BREAKER RATING
  - AZ - CIRCUIT BREAKER LOCATION MARKER
  - 63 - CIRCUIT BREAKER B/M ITEM NUMBER REFERENCE DRAWING 28
  - 25A(3) - FUSE
  - 25A - FUSE RATING
  - ACX,Y,Z - FUSE LOCATION MARKER
  - (3) - NUMBER OF FUSES
  - 82 - FUSE B/M ITEM NUMBER REFERENCE DRAWING 28

- NOTES
1. INCOMING LUGS SHALL BE MOUNTED AT THE TOP OF PANEL.
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 2 POLE THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. ALL EQUIPMENT/DEVICES/CABLES SHOWN ON THIS DWG ARE CLASS 1E, TRAIN A UNLESS NOTED OTHERWISE.
  4. CABLE NUMBER E'204837 IS DISCONNECTED AND CONDUCTORS TAPED AT BOTH ENDS. FUTURE USE OF THIS CABLE DURING OUTAGES REQUIRES AUTHORIZATION THROUGH A DCA. CABLE NUMBER HAS BEEN REIDENTIFIED AS SP204837.
  5. SPACE HEATERS IN 480V SWITCHGEAR HAVE BEEN DISCONNECTED. RECONNECTION DURING OUTAGE, IF NEEDED, REQUIRES AUTHORIZATION THROUGH A DCA. FUSES AND LEAD WIRE TO RECEPTACLES HAVE BEEN REMOVED AND SHALL NOT BE REINSTALLED.
  6. DELETED.
  7. ALL PANELBOARD CIRCUIT BREAKERS ARE EQUIPPED WITH ONE SINGLE POLE DOUBLE THROW AUXILIARY CONTACT.
  8. MOTOR SPACE HEATER BRKERS LOCATED IN COMPARTMENT A ARE WIRED TO TERMINALS IN THE LOWER COMPARTMENT AS INDICATED ON THE REFERENCED SCHEMATIC DIAGRAM.
  9. MOTOR SPACE HEATER BRKERS FOR FUTURE DEVICES ARE WIRED TO TERMINALS IN THE COMPARTMENTS INDICATED ON THIS DWG.
  10. INTERNAL TAP JUMPING WIRE SIZE FOR TRANSFORMER SHALL BE PER TABLE-1, DBD-EE-041.

- REFERENCE DRAWINGS
1. 33-S1261-E2514
  2. 33-S1261-E2516
  3. 33-S1261-E2517
  4. 33-S1261-E2518
  5. 33-S1261-E2519
  6. 33-S1261-E2520
  7. 33-S1261-E2521
  8. 33-S1261-E2522
  9. 33-S1261-E2523
  10. 33-S1261-E2524
  11. 33-S1261-E2525
  12. 33-S1261-E2526
  13. 33-S1261-E2527
  14. 33-S1261-E2528
  15. 33-S1261-E2529
  16. 33-S1261-E2530
  17. 1619F66
  18. 1619F65
  19. 1619F69
  20. 1619F73
  21. 1619F71
  22. 1619F72
  23. 182C79225 SH 14A AND 14B
  24. 1983C98
  25. 8693D37
  26. 1823F97
  27. 1619F74
  28. E2-0024-04
  29. 1619F67
  30. 1983C98
  31. 8706D98
  32. 33-S1261-D2515
  33. E2-0027-01
  34. E2-0005
  35. 1823F96

DRAWING E2-0018-01	REV CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0018-01	
E2-0018-01A	
E2-0018-01B	

TRAIN A

CLASS I

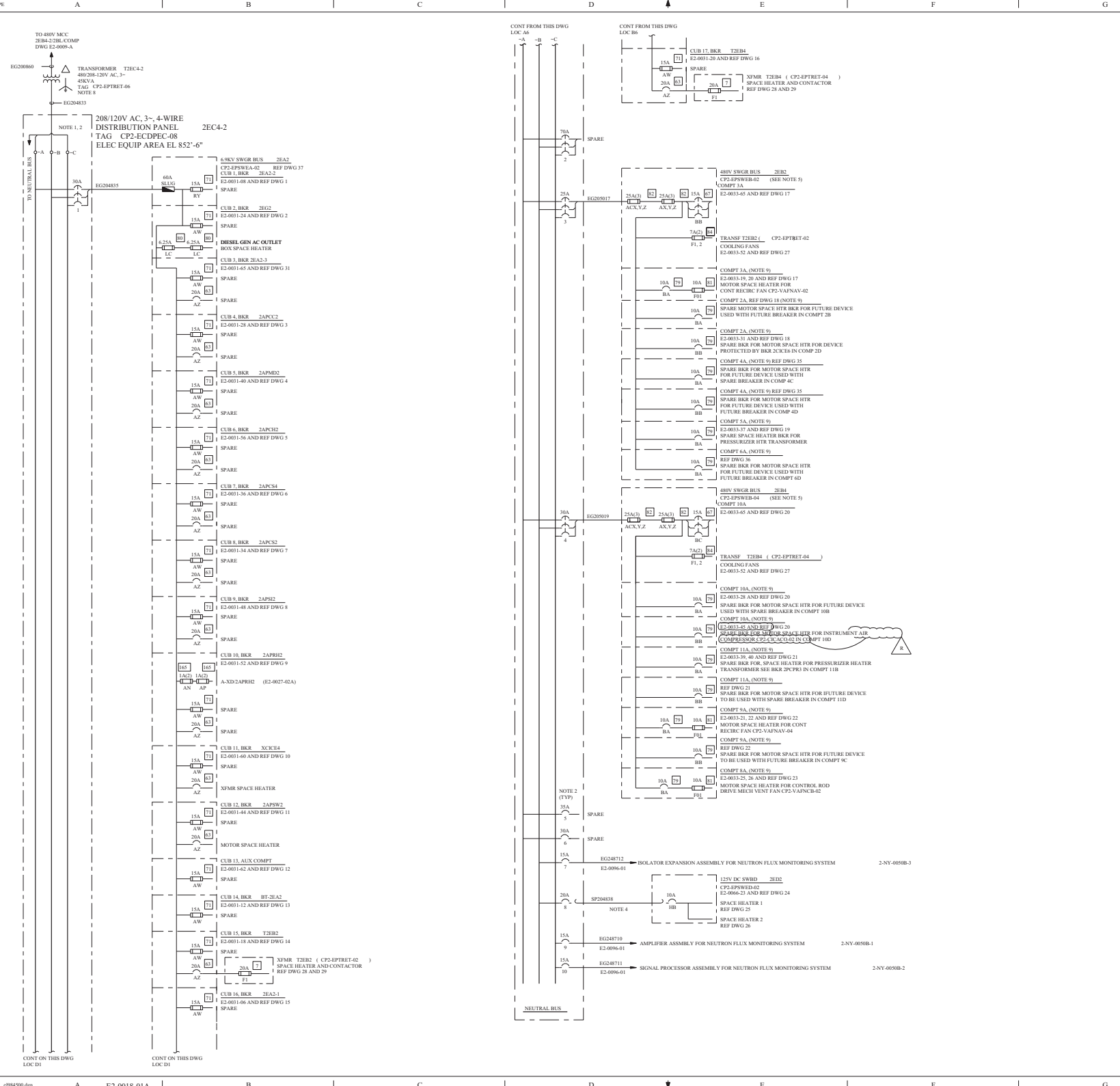
(NUCLEAR SAFETY-RELATED)  
SAFETY CLASS 1 SEISMIC CATEGORY I  
SAFETY CLASS 2 CLASS II  
SAFETY CLASS 3 ASSOCIATED CIRCUITS

TXU POWER  
CPSES  
GLEN ROSE, TEXAS

208/120V AC  
ONE LINE DIAGRAM

THIS DRAWING CREATED ELECTRONICALLY





**FSAR FIGURE 8.3-15A**

**TRAIN B**  
**CLASS I**  
(NUCLEAR SAFETY RELATED)

**TXU POWER**  
**CPSES**  
**GLEN ROSE, TEXAS**

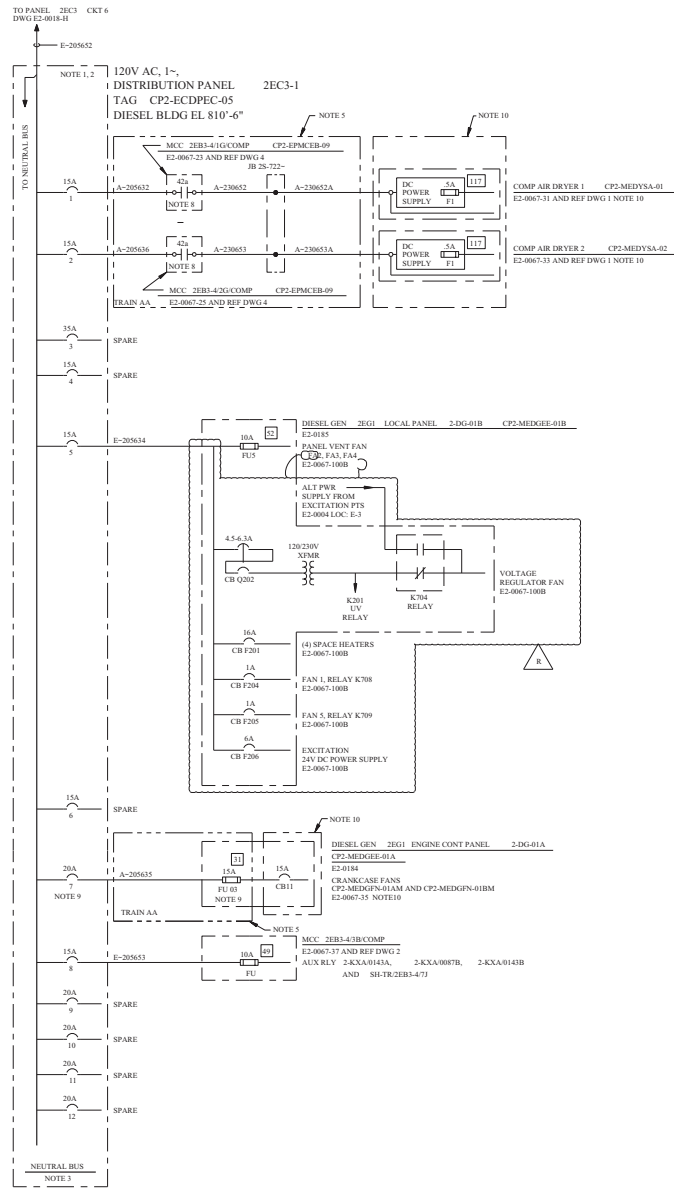
**208/120V AC**  
**ONE LINE DIAGRAM**

REV	DATE	DESCRIPTION	BY	CHKD	APP'D
01A	01/11/01	ISSUED FOR CONSTRUCTION			

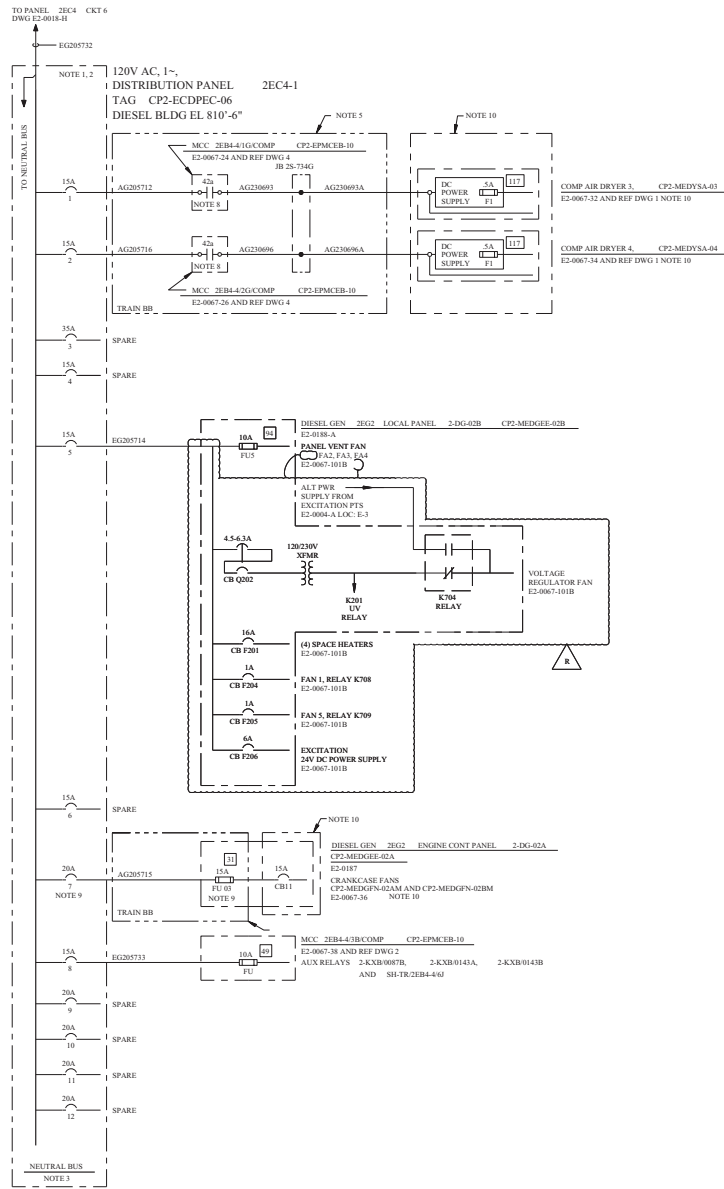
DWG NO.	REV	DATE
E2-0018	01A	01/11/01

CP-10





TRAIN A



TRAIN B

REV	DATE	BY	CHKD	APPD	REMARKS
P-02	01/11/04	000	000	000	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDN-2001-001251-04-00 PER IEC 0094-01-001251-04-00

FSAR FIGURE 8.3-15A

- LEGEND
- 15A - CIRCUIT BREAKER
  - 15A - CIRCUIT BREAKER RATING
  - 1 - CIRCUIT NO
  - 10A - FUSE
  - 10A - FUSE RATING
  - 5A - FUSE B/M ITEM NUMBER REF DWG 3
  - - - - - INDICATES SPLICE PER 232-43-100
  - - INDICATES CONNECTION TO TERMINAL

- NOTES
1. INCOMING LUGS SHALL BE MOUNTED AT THE TOP OF DISTRIBUTION PANEL.
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. VERTICAL NEUTRAL BUS.
  4. ALL EQUIPMENT DEVICES/CABLES ON THIS DRAWING ARE CLASS 1E, TRAIN A OR B AS NOTED.
  5. - - - - - ALL WIRING AND CABLING ENCLOSED BY DASHED LINES IS ASSOCIATED CLASS 1E, TRAIN AA OR BB AS NOTED UNLESS OTHERWISE IDENTIFIED.
  6. DELETED.
  7. ALL PANELBOARD CIRCUIT BREAKERS ARE EQUIPPED WITH ONE SINGLE POLE DOUBLE THROW AUXILIARY CONTACT.
  8. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOADS IS PROVIDED BY OPENING THE CLASS 1E CONTACT ON SIAS.
  9. ISOLATION BETWEEN CLASS 1E BUS AND NON-CLASS 1E LOADS IS PROVIDED BY CLASS 1E FUSE AND BREAKER IN SERIES.
  10. ALL EQUIPMENT DEVICES INSIDE THESE DASHED LINES OR FED BY THESE CIRCUITS ARE NON-CLASS 1E.

- REFERENCE DRAWINGS
1. PNEUMATIC PRODUCTS CORP DWG 1044438-D2 SH 1
  2. 21207150 SH 15B-2
  3. E2-0024-04
  4. 21207150 SH 20B-4

DRAWING E2-0018-01	REV CP-2
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:	
E2-0018-01	
E2-0018-01A	
E2-0018-01B	

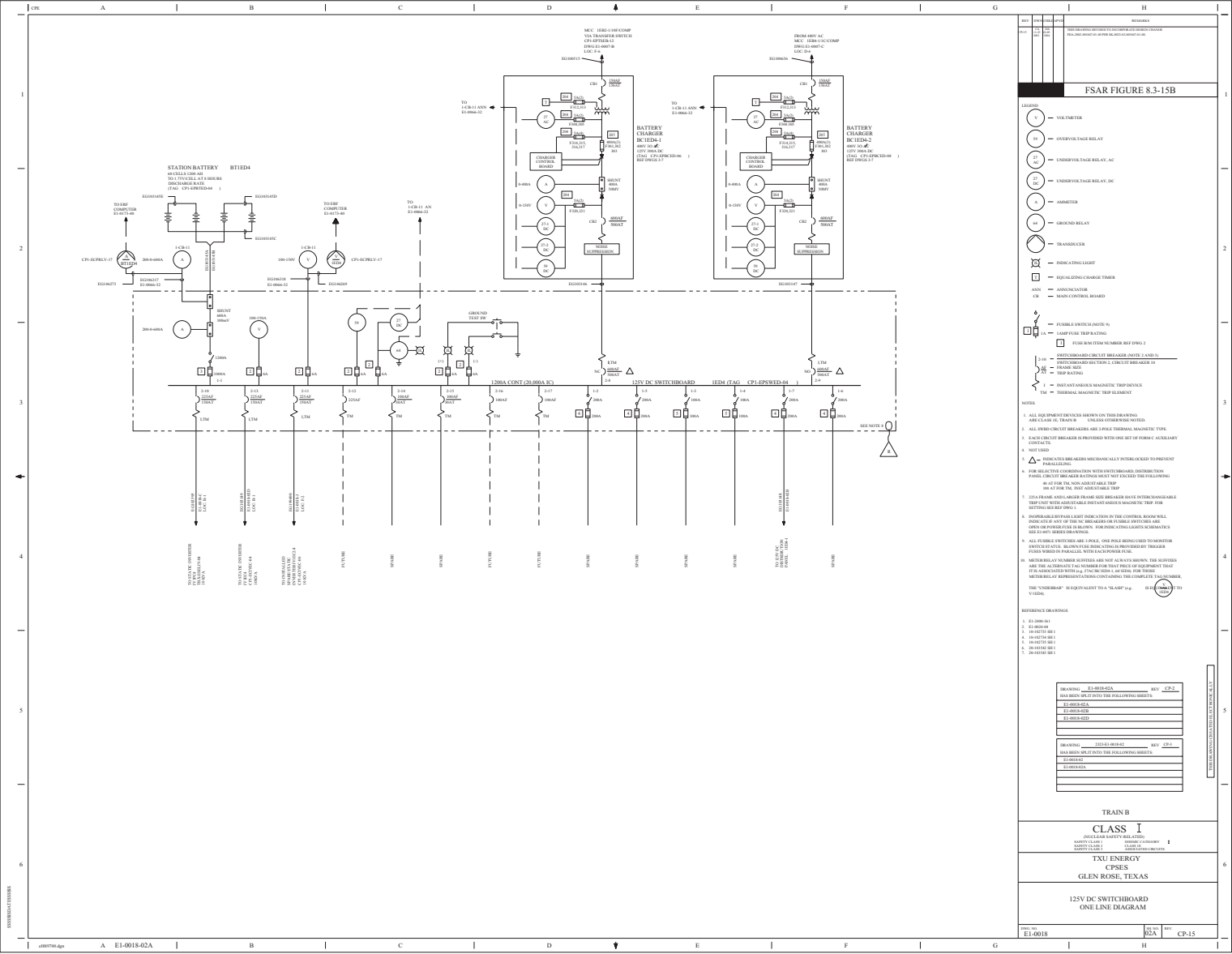
**CLASS I**  
(ONE CLEAR SAFETY RELATED)  
SAFETY CLASS 1      SERVICE CATEGORY I  
SAFETY CLASS 2      CLASS 1E  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

**TXU POWER**  
CPSES  
GLEN ROSE, TEXAS

120V AC  
ONE LINE DIAGRAM

DWG. NO.	REV.
E2-0018	01B CP-12





REV	DATE	BY	CHKD	REVISION
001	08/20/18	CP2	CP2	REVISED FOR CP1-SP250-04

FSAR FIGURE 8.3-15B

- LEGEND:
- (V) VOLTAGE
  - (UR) UNDERVOLTAGE RELAY
  - (UC) UNDERVOLTAGE RELAY-AC
  - (URC) UNDERVOLTAGE RELAY-DC
  - (A) AMMETER
  - (GR) GROUND RELAY
  - (TR) TRANSFORMER
  - (IL) INDICATING LIGHT
  - (CC) FUSING/CHARGE CIRCUIT
  - (M) MAIN CONTROL BOARD
  - (FS) FUSIBLE SWITCH (NOTE 1)
  - (FT) TAMP FUSE TRIP RATING
  - (F) FUSE (SEE ITEM NUMBER REF DWG 2)
  - (MTR) MAGNETIC TRIP (SEE NOTE 1 AND 2)
  - (TMR) THERMAL TRIP RATING
  - (T) TRIP RATING
  - (IM) INSTANT ANGLE MAGNETIC TRIP DEVICE
  - (TM) THERMAL MAGNETIC TRIP ELEMENT

- NOTES:
1. ALL EQUIPMENT DEVICES SHOWN ON THIS DRAWING ARE CLASS II, TRAIN 3 UNLESS OTHERWISE NOTED.
  2. ALL UNDERVOLTAGE BREAKERS ARE SINGLE TERMINAL MAGNETIC TYPE.
  3. EACH CIRCUIT BREAKER IS PROVIDED WITH ONE SET OF FORM C AUXILIARY CONTACTS.
  4. NOT USED.
  5. WHERE A CIRCUIT BREAKER IS MECHANICALLY INTERLOCKED TO PREVENT PARALLELING.
  6. FOR RELATIVE COORDINATION WITH THE OVERCURRENT PROTECTION PANEL CIRCUIT BREAKER RATINGS DO NOT EXCEED THE FOLLOWING:
    - 10 KA FOR THE MAIN BUS AND MAIN TRIP
    - 10 KA FOR THE INST ADJUSTABLE TRIP
    - 25 KA FOR THE INST ADJUSTABLE TRIP INSTANT ANGLE MAGNETIC TRIP FOR MOTOR FEEDBACK TRIP
  7. DISCONNECT AND/OR FUSE FROM THE BREAKER MUST BE INTERCHANGEABLE TRIP INST WITH ADJUSTABLE INSTANT ANGLE MAGNETIC TRIP FOR MOTOR FEEDBACK TRIP.
  8. INDICABLE BY A RED LIGHT INDICATION IN THE CONTROL ROOM WILL INDICATE ANY OF THE 30 BREAKERS OR FUSES OPENED OR OPEN OR OPENED IN ALARM. FOR INDICATING LIGHTS IN SCHEMATICS WILL NOT BE USED.
  9. ALL FUSIBLE SWITCHES ARE 1-POLE, ONE POLE BEING USED TO MONITOR INDICATING LIGHTS. INDICATING LIGHTS PROVIDED BY THE BREAKER FUSES WOULD BE PARALLEL WITH EACH POWER FUSE.
  10. MATERIALS NUMBER DEVICES ARE NOT ON ANY DEVICES. THE DEVICES ARE THE ADDRESS IS A NUMBER FOR THAT PRICE OF EQUIPMENT THAT IS ASSOCIATED WITH IT. THE NUMBER IS USED FOR THE METER RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER.
  11. THE "VOLTAGE" IS EQUIVALENT TO "ALARM" IN THE CONTROL ROOM.

- REFERENCE DRAWINGS:
- 1. E1-2000-00
  - 2. E1-2000-00
  - 3. E1-2000-00
  - 4. E1-2000-00
  - 5. E1-2000-00
  - 6. E1-2000-00

DRAWING: E1-0018-02A	REV: CP2
DESIGNED BY: [ ]	DATE: [ ]
CHECKED BY: [ ]	DATE: [ ]
APPROVED BY: [ ]	DATE: [ ]
DATE: [ ]	DATE: [ ]
DATE: [ ]	DATE: [ ]
DATE: [ ]	DATE: [ ]

TRAIN B

**CLASS I**  
(NUCLEAR SAFETY RELATED)

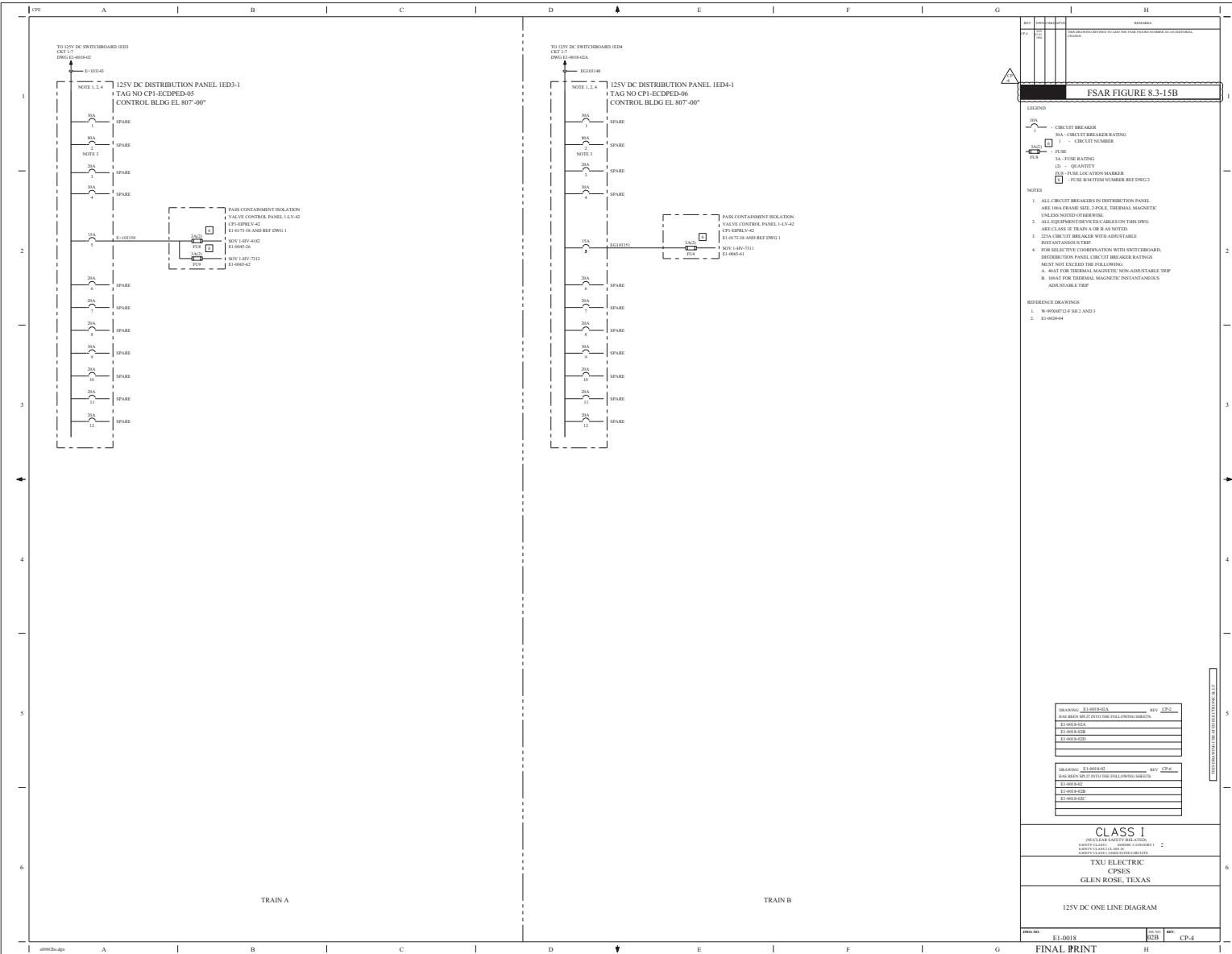
TXU ENERGY  
 CPSIS  
 GLEN ROSE, TEXAS

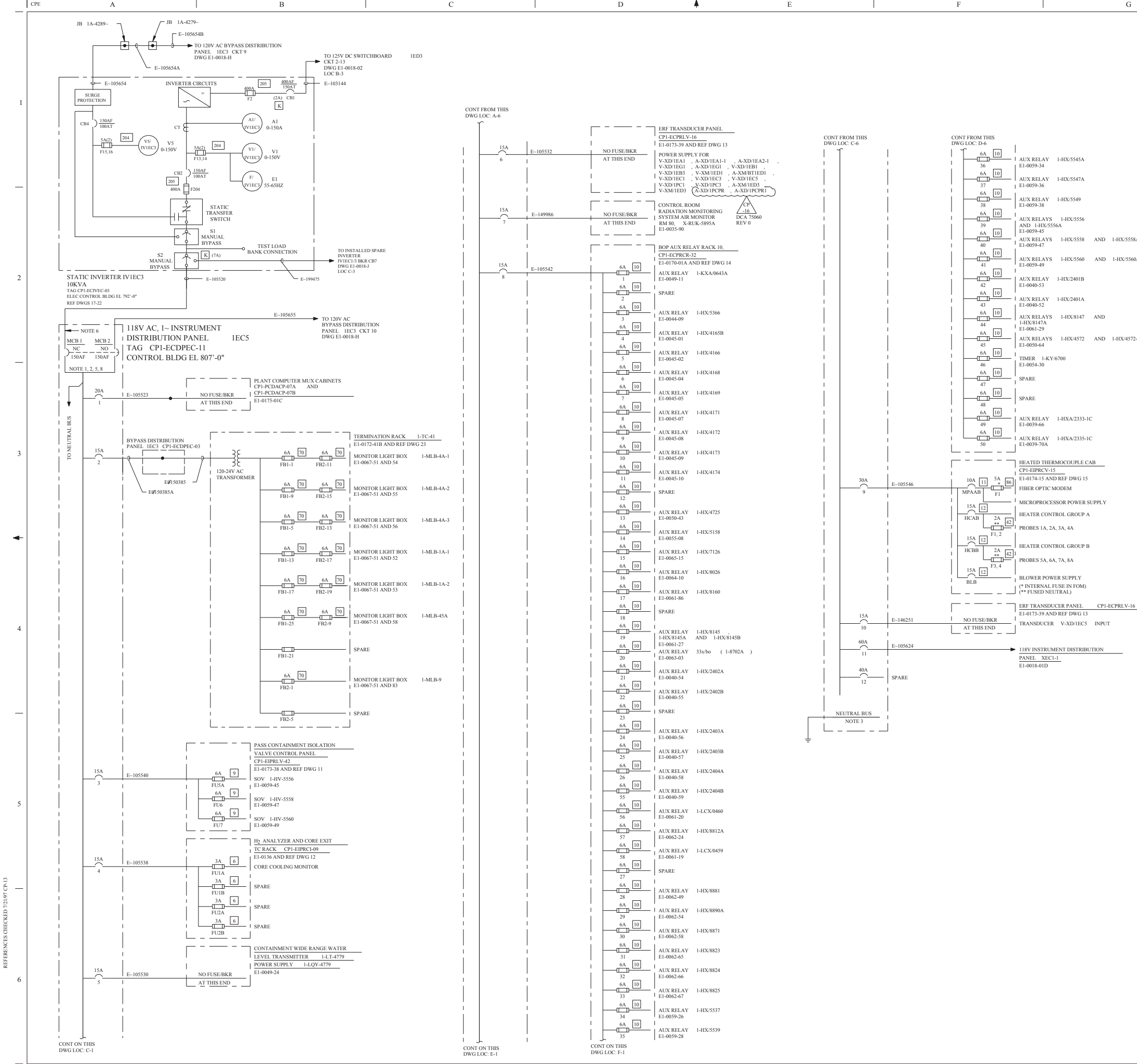
12V DC SWITCHBOARD  
 ONE LINE DIAGRAM

FIG. NO. E1-0018

REV. NO. 02A

REV. CP-15





REV	DWN	CHK	APPV	REMARKS
CP-16	SM	06/11	2010	THIS DRAWING REVISED TO PROPERLY INCORPORATE DESIGN CHANGE DCA 7500 REV 0 AND PER AL-CCR-2010-009206-1.

**FSAR FIGURE 8.3-15B**

**LEGEND**

- MANUAL TRANSFER SWITCH
- THERMAL MAGNETIC TRIP CIRCUIT
- THREE POLE
- CIRCUIT BREAKER
- CIRCUIT BREAKER RATING
- CIRCUIT NO
- FUSE
- FUSE RATING
- FUSE LOCATION MARKER
- FUSE BM ITEM NUMBER, REF DWG 16
- VOLTMETER
- AMMETER
- FREQUENCY METER
- KIRK KEY INTERLOCK
- LOCK NUMBER
- MANUAL BYPASS SWITCH
- MAKE BEFORE BREAK, 2 POSITION
- INDICATES SPLICE (SPLICE PER SPEC ES-100)

**NOTES**

- MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
- ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
- VERTICAL NEUTRAL BUS.
- EQUIPMENT/DEVICES SHOWN ON THIS DRAWING ARE CLASS 1E, TRAIN A UNLESS NOTED OTHERWISE.
- ALL CIRCUIT BREAKERS INCLUDING MANUAL TRANSFER SWITCH ARE EQUIPPED WITH I-NO AND I-NC AUX CONTACT. FOR SSI INDICATING LIGHT SCHEMATICS SEE EI-0071 SERIES DRAWINGS.
- REDUCE CABLE AT THIS POINT FROM 4/0 TO 2/0 BY SPLICING PER DETAIL 13 OF DWG EI-1701.
- METER/RELAY TAG NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. VM4/IVIEC3, AM3/IVIEC3).
- THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES. SEE DBD-EE-043 FOR DETAILS.

**REFERENCE DRAWINGS**

- DELETED
- DELETED
- DELETED
- DELETED
- DELETED
- DELETED
- DELETED
- DELETED
- DELETED
- DELETED
- W-99X08712-F SH 1, 5 AND 6
- 112D003 SH 1 AND 2
- E-6604
- E-6557 SH 1, 4
- E-4182-422-103 SH 1, 2
- E1-0024-04
- 10-102722 SH 1, 2
- 10-102723 SH 1
- 10-102724 SH 1
- 20-103521 SH 1, 2
- 20-103522 SH 1
- 20-103523 SH 1
- DELETED
- DELETED
- W-TC41701-D SH 1, 2

DRAWING	EI-0018-02	REV	CP-6
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
EI-0018-02			
EI-0018-02B			
EI-0018-02C			

**TRAIN A**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1      SAFETY CATEGORY I  
SAFETY CLASS 2      SAFETY CLASS 3

**LUMINANT**  
**CPNPP**  
**GLEN ROSE, TEXAS**

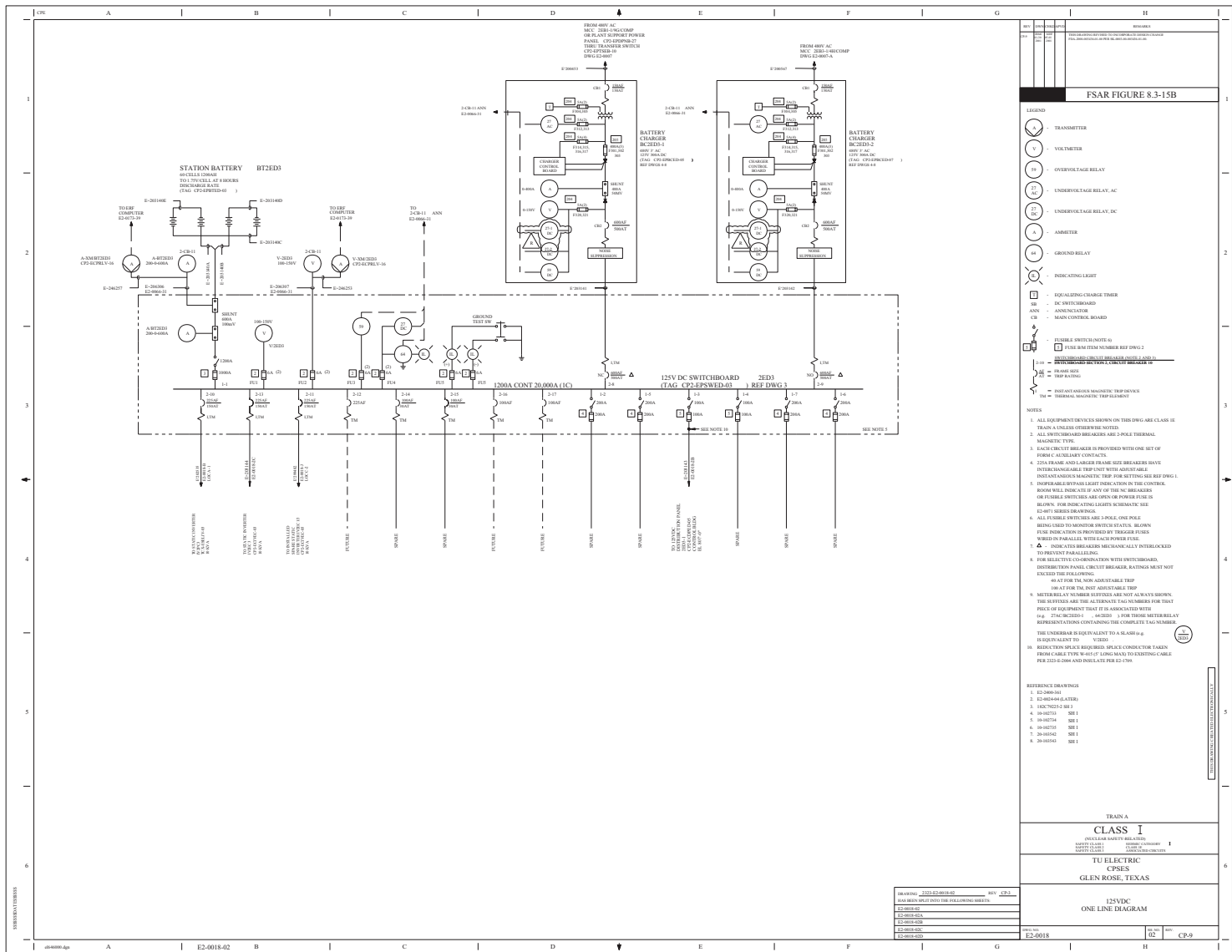
118V AC  
ONE LINE DIAGRAM

DWG. NO.	REV.
EI-0018	02C
	CP-16

**FINAL PRINT**

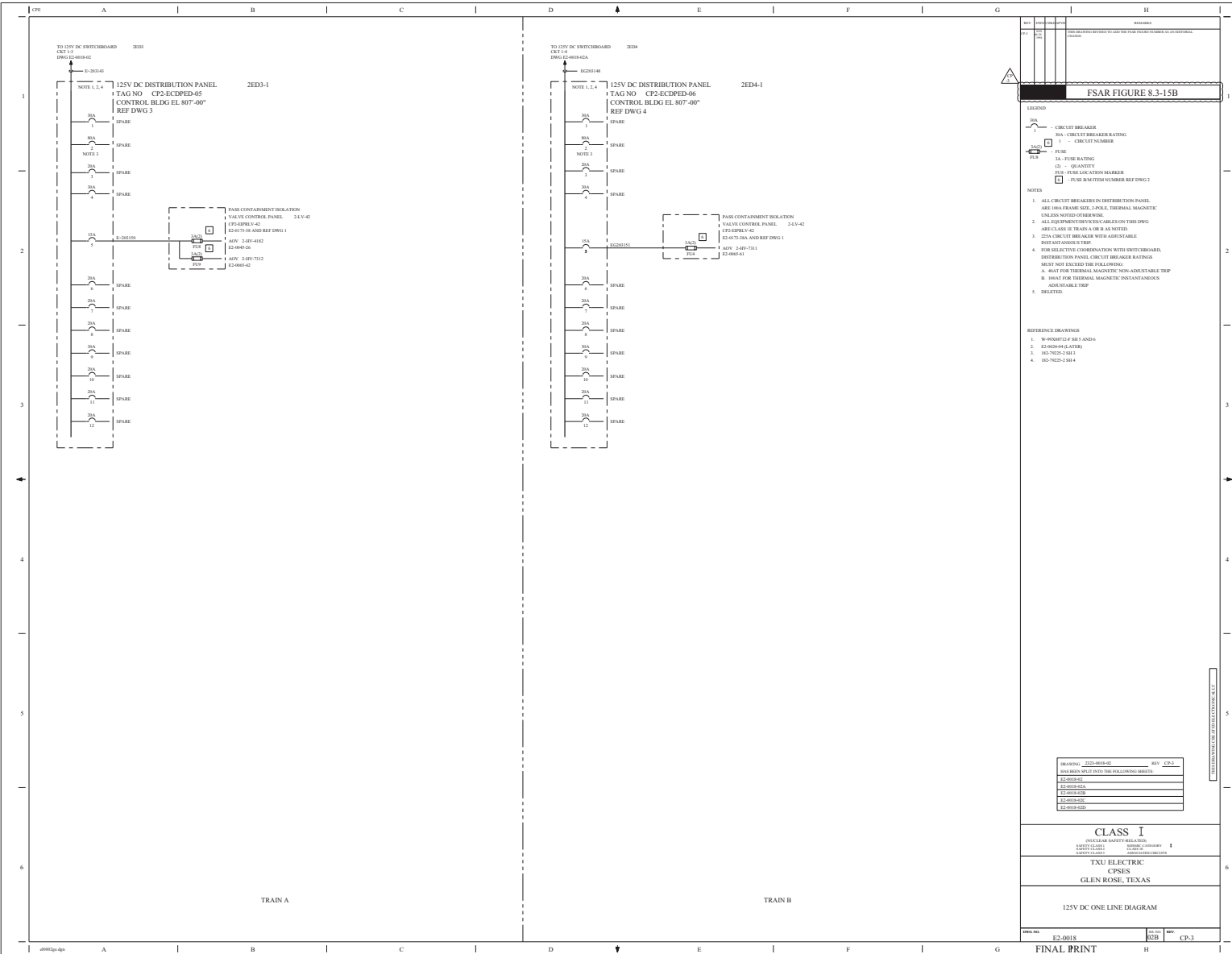
THIS DRAWING CREATED ELECTRONICALLY





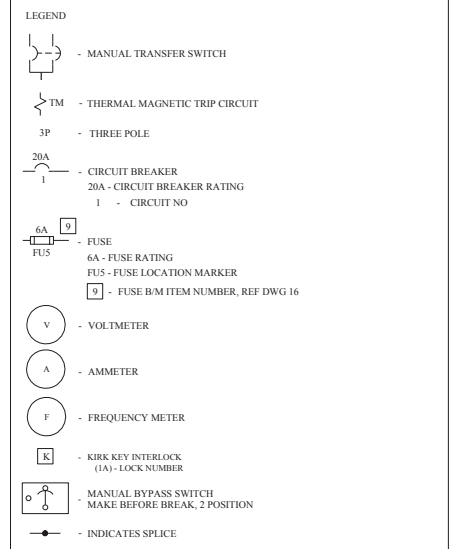






REV	CHKD	APPV	REMARKS
CP-9	SM	2010	THIS DRAWING REVISED TO PROPERLY INCORPORATE DESIGN CHANGE DCA 10086 REV 9 AND PER AL-CR-2010-009206-1

**FSAR FIGURE 8.3-15B**



- NOTES**
- MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
  - ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  - VERTICAL NEUTRAL BUS.
  - EQUIPMENT/DEVICES SHOWN ON THIS DRAWING ARE CLASS 1E, TRAIN A UNLESS NOTED OTHERWISE.
  - EACH CIRCUIT BREAKER IS PROVIDED WITH ONE SET OF FORM C AUXILIARY CONTACT.
  - DELETED.
  - METER/RELAY TAG NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (e.g. VM4IV2EC3, AM3IV2EC3).
  - DELETED.
  - SPLICE IN ACCORDANCE WITH SPECIFICATION CPES-E-2004.
  - THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES. SEE DBD-EE-043 FOR DETAILS.

- REFERENCE DRAWINGS**
- W-99X08712-F SH 4 AND 5
  - 112D003 SH 1 AND 2
  - E-6608
  - E-6558 SH 1, 2, 3, 4
  - E-4182-422-103 SH 1, 2
  - E-2-0024-04 (LATER)
  - DELETED
  - 182-79230-7-3
  - 20-102722 SH 1, 2
  - 20-102723 SH 1
  - 20-102724 SH 1
  - 20-103521 SH 1, 2
  - 20-103522 SH 1
  - 20-103523 SH 1

DRAWING NO.	REV
2323-0018-02	CP-3

HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:

E2-0018-02
E2-0018-02A
E2-0018-02B
E2-0018-02C
E2-0018-02D

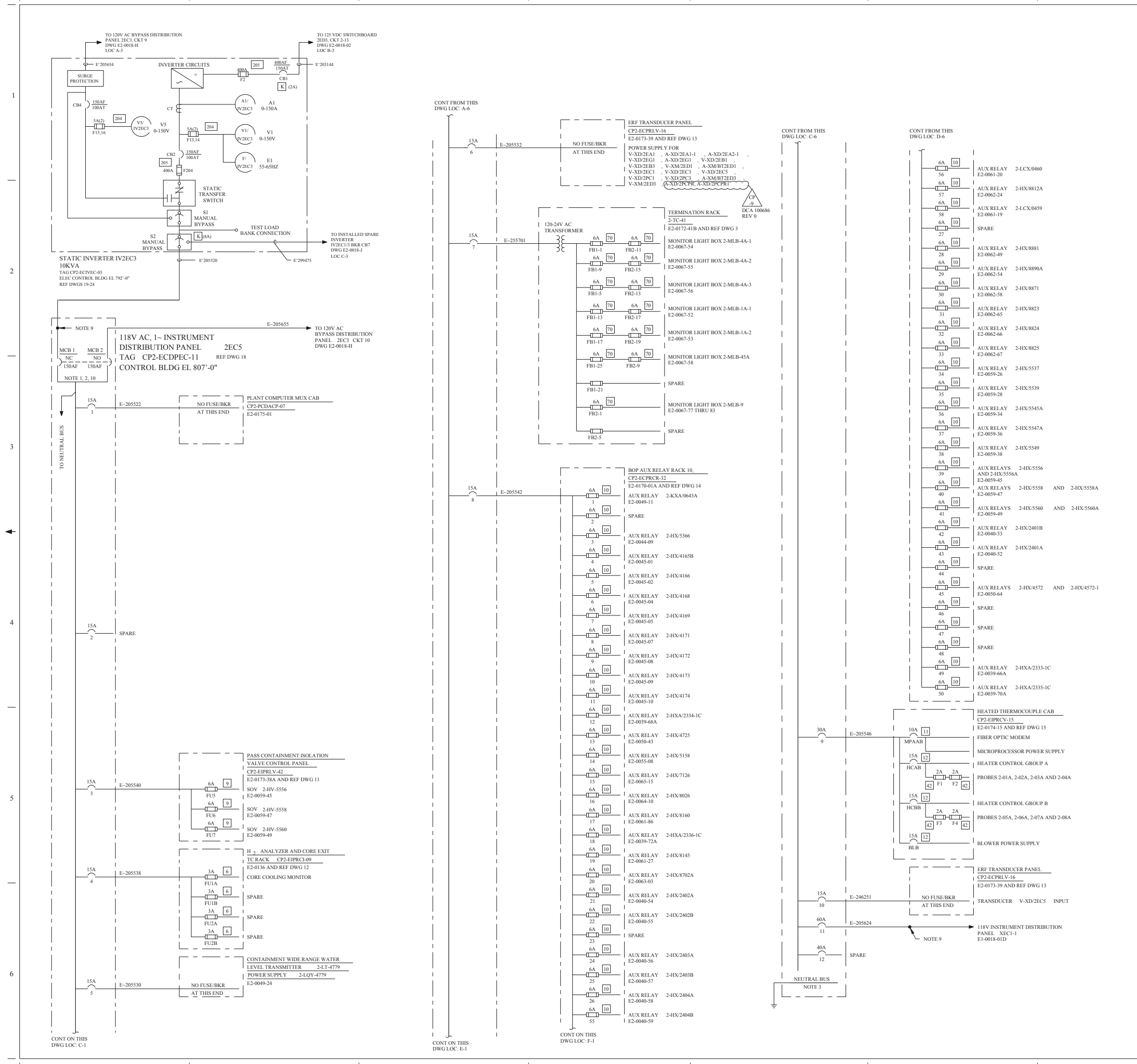
**TRAIN A**

**CLASS I**  
(NUCLEAR SAFETY-RELATED)

SAFETY CLASS 1      SERVIC CATEGORY I  
SAFETY CLASS 2      CLASS I  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

**LUMINANT**  
CPNPP  
GLEN ROSE, TEXAS

118V AC  
ONE LINE DIAGRAM



REV	CHG	CHKD	APVD	REMARKS
CP-10	300	10/12/2010		THIS DRAWING REVISED TO PROPERLY INCORPORATE DESIGN CHANGES DCA 100686 REV 0 AND DCN 06074 REV 1 AND PER A1-CR-00010-009206-1

**FSAR FIGURE 8.3-15B**

- LEGEND**
- MANUAL TRANSFER SWITCH
  - THERMAL MAGNETIC TRIP ELEMENT
  - THREE POLE
  - CIRCUIT BREAKER  
20A - CIRCUIT BREAKER RATING  
1 - CIRCUIT NUMBER
  - FUSE  
6A - FUSE RATING  
FUI - FUSE LOCATION MARKER  
9 - FUSE B/M ITEM NUMBER REF DWG 16
  - VOLTMETER
  - AMMETER
  - FREQUENCY METER
  - KIRK KEY INTERLOCK  
(1A) - LOCK NUMBER
  - MANUAL BYPASS SWITCH  
MAKE BEFORE BREAK, 2 POSITION
  - INDICATES SPLICE

- NOTES**
1. MANUAL TRANSFER SWITCH SHALL BE MOUNTED ON THE BOTTOM OF DISTRIBUTION PANEL. SWITCH IS NON-AUTOMATIC (NO TRIPS).
  2. ALL CIRCUIT BREAKERS IN DISTRIBUTION PANEL ARE 100A FRAME SIZE, 2-POLE, THERMAL MAGNETIC UNLESS NOTED OTHERWISE.
  3. VERTICAL NEUTRAL BUS.
  4. EQUIPMENT/DEVICES SHOWN ON THIS DRAWING ARE CLASS 1E, TRAIN B UNLESS NOTED OTHERWISE.
  5. EACH CIRCUIT BREAKER IS PROVIDED WITH ONE SET OF FORM C AUXILIARY CONTACT.
  6. REDUCE CABLE AT THIS POINT FROM 4 TO 20 BY SPLICING PER CPES-E-2004.
  7. METER/RELAY TAG NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG NUMBER FOR THAT PIECE OF EQUIPMENT THAT IT'S ASSOCIATED WITH. (e.g. AM1/IV2EC4, FM5/IV2EC4).
  8. DELETED.
  9. SPLICE IN ACCORDANCE WITH CPES-E-2004. REDUCTION 2/C #6 TO 2/C #10.
  10. SPLICE IN ACCORDANCE WITH CPES-E-2004. REDUCTION 2/C #6 TO 2/C #8.
  11. SPLICE IN ACCORDANCE WITH SPECIFICATION CPES-E-2004.
  12. THE MECHANICAL BREAKER INTERLOCK MAY BE REMOVED UNDER CERTAIN CIRCUMSTANCES. SEE DBD-EE-043 FOR DETAILS.

- REFERENCE DRAWINGS**
11. W-99X08712-F SH 2 AND 3
  12. 112D903 SH 1 AND 2
  13. E-6610
  14. E-6560 SH 1, 2, 3, 4
  15. E-4182-422-103 SH 3, 4
  16. E2-0024-04 (LATER)
  17. DELETED
  18. 182-79230-7-4
  19. 20-102722 SH 1, 2
  20. 20-102723 SH 1
  21. 20-102724 SH 1
  22. 20-103521 SH 1, 2
  23. 20-103522 SH 1
  24. 20-103523 SH 1

DRAWING	2323-E2-0018-02	REV	CP-3
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS			
E2-0018-02			
E2-0018-02A			
E2-0018-02B			
E2-0018-02C			
E2-0018-02D			

**TRAIN B**

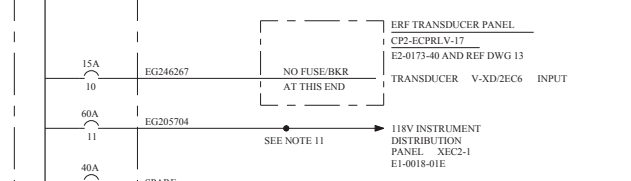
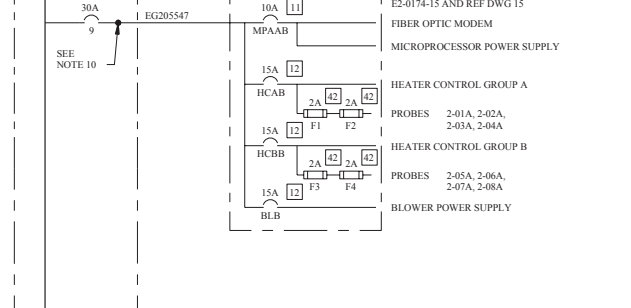
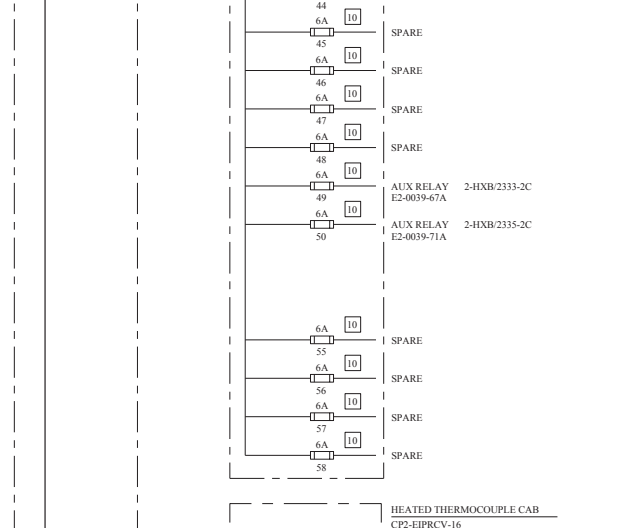
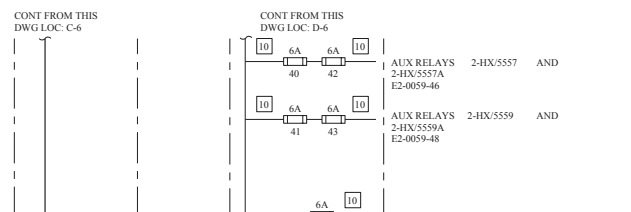
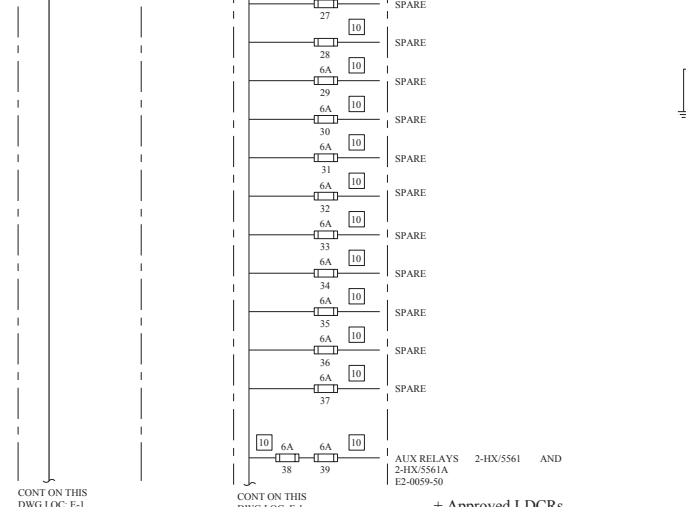
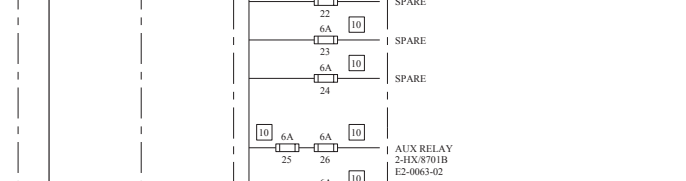
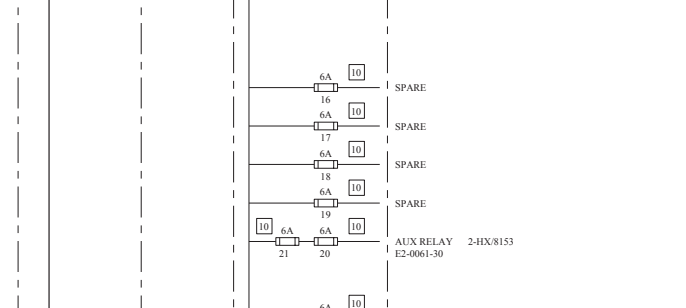
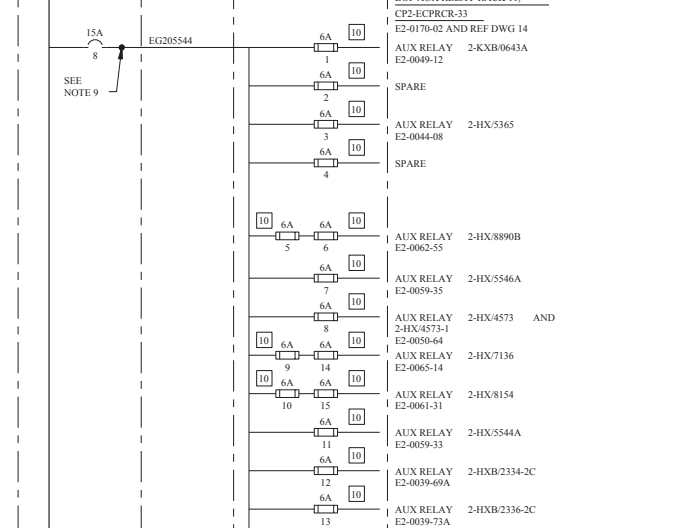
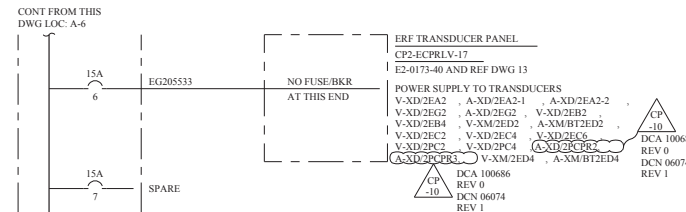
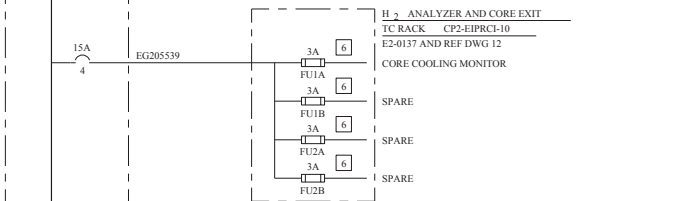
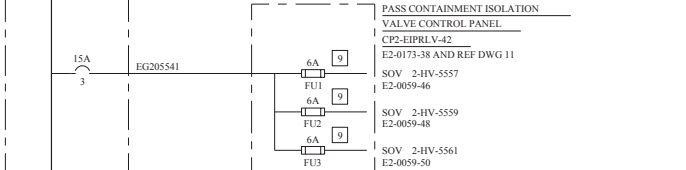
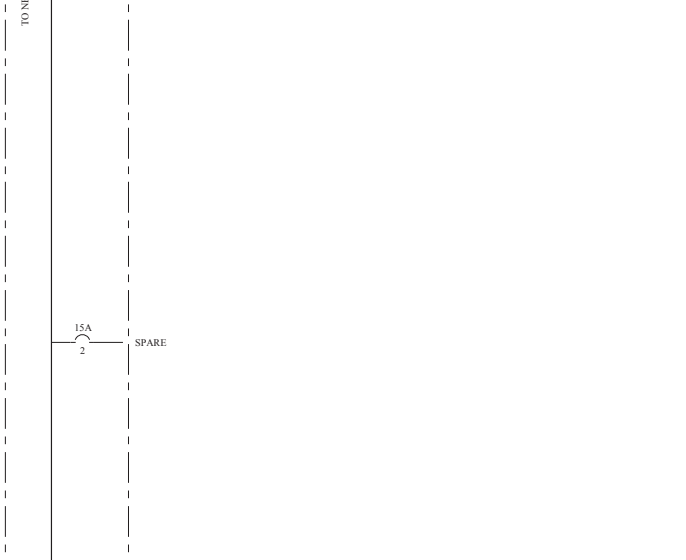
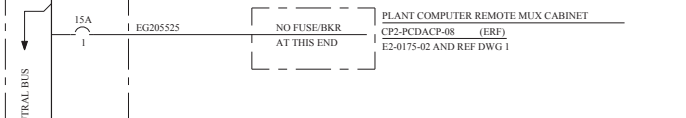
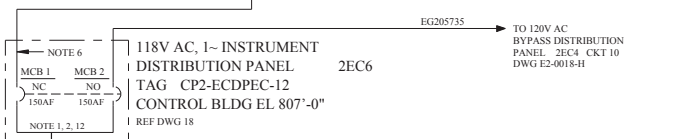
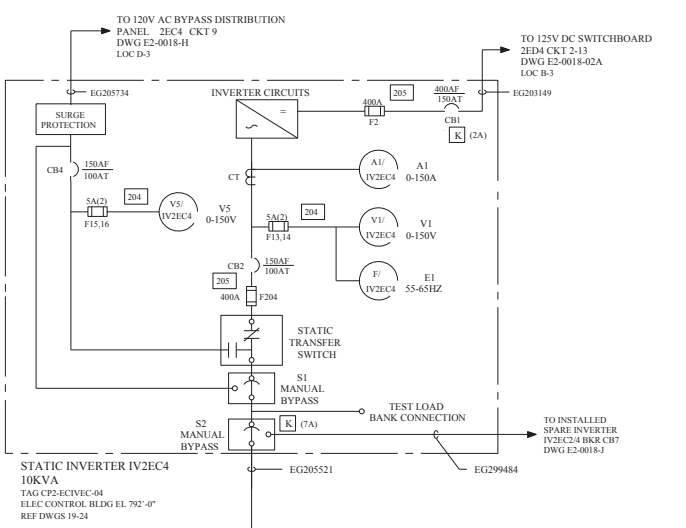
**CLASS I**  
(NUCLEAR SAFETY-RELATED)

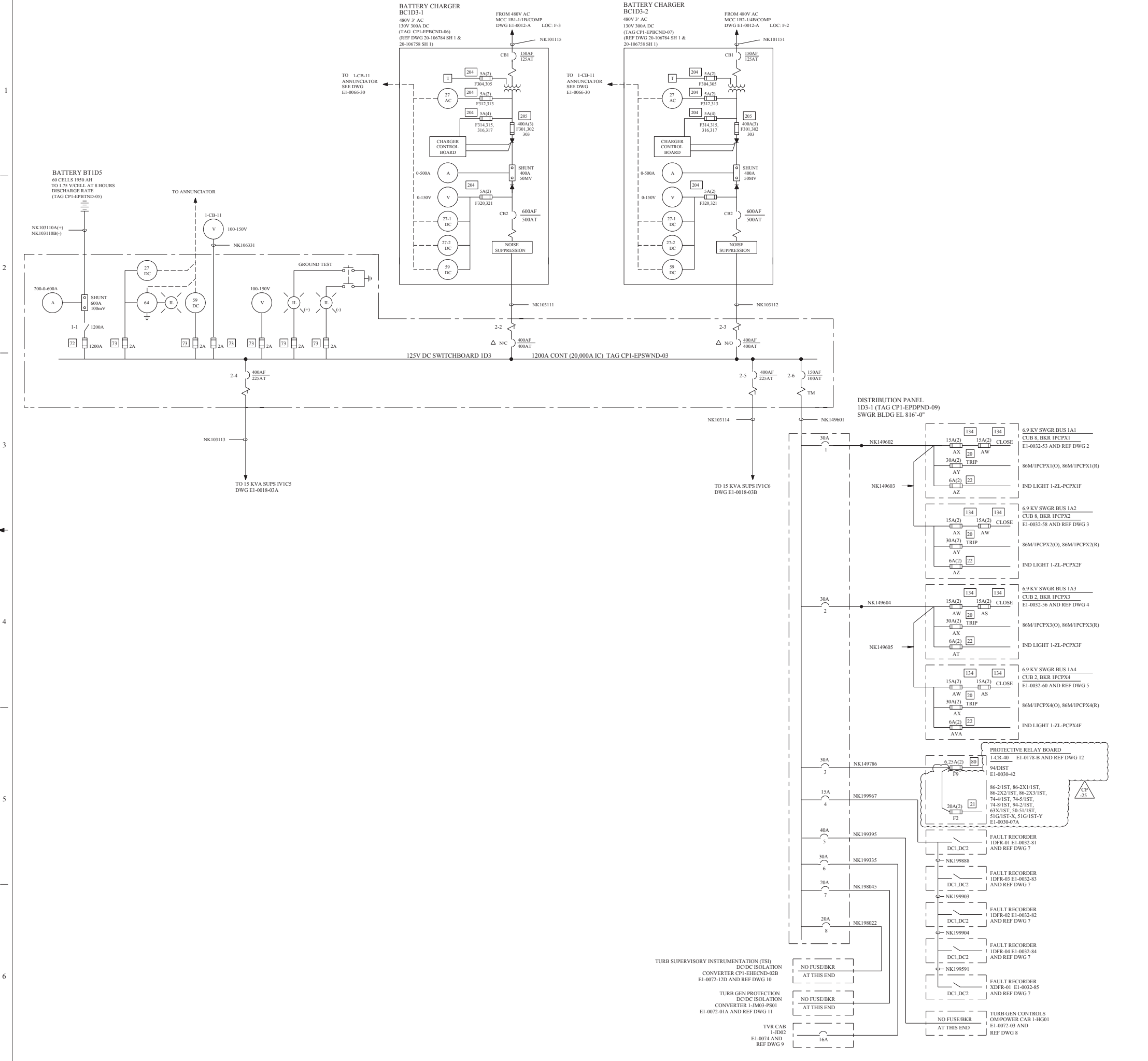
SAFETY CLASS 1      SERVIC CATEGORY I  
SAFETY CLASS 2      CLASS II  
SAFETY CLASS 3      ASSOCIATED CIRCUITS

**LUMINANT CPNPP**  
**GLEN ROSE, TEXAS**

**118V AC ONE LINE DIAGRAM**

DWG. NO.	E2-0018	SH. NO.	02D	REV.	CP-10
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REV	DWN	CHKD	APVD	REMARKS
CP-25	11-02	2011		THIS DRAWING REVISED TO INCORPORATE EDITORIAL CHANGES AS NOTED PER A.I.C.R.2011-012261-1.

**FSAR FIGURE 8.3-15C**

**LEGEND**

	V	VOLTMETER
	59 DC	OVERVOLTAGE RELAY DC
	27 DC	UNDERVOLTAGE RELAY DC
	A	AMMETER
	27 AC	UNDERVOLTAGE RELAY AC
	64	GROUND DETECTION RELAY
	IL	INDICATING LIGHT
	T	EQUALIZING CHARGE TIMER
		FUSIBLE DISCONNECT SWITCH (SEE NOTE 2)
	AF AT	CIRCUIT BREAKER FRAME SIZE TRIP RATING
		ADJUSTABLE MAGNETIC TRIP
	TM	THERMAL MAGNETIC
	Δ	INDICATES BREAKERS MECHANICALLY INTERLOCKED TO PREVENT PARALLELING
	•	SPLICE
	30A(2) AX	FUSE 30A - FUSE RATING (2) - QUANTITY AX - FUSE LOCATION MARKER CLOSE - BREAKER CLOSE CIRCUIT 20 - FUSE B/M ITEM NUMBER (REF DWG 6)

- NOTES**
- ALL CIRCUIT BREAKERS ARE THERMAL MAGNETIC UNLESS OTHERWISE NOTED.
  - ALL FUSIBLE DISCONNECT SWITCHES ARE 3-POLE, ONE POLE BEING USED TO MONITOR SWITCH STATUS. BLOWN FUSE INDICATION IS PROVIDED BY TRIGGER FUSES WIRED IN PARALLEL WITH EACH POWER FUSE.
  - 225 FRAME AND LARGER FRAME SIZE BREAKERS HAVE INTERCHANGEABLE TRIP UNIT WITH ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP. FOR SETTING SEE REF DWG 1.
  - REFER TO DRAWING D1-HWEHC AND D1-HWTVR FOR SIEMENS REFERENCE DRAWINGS.

**REFERENCES**

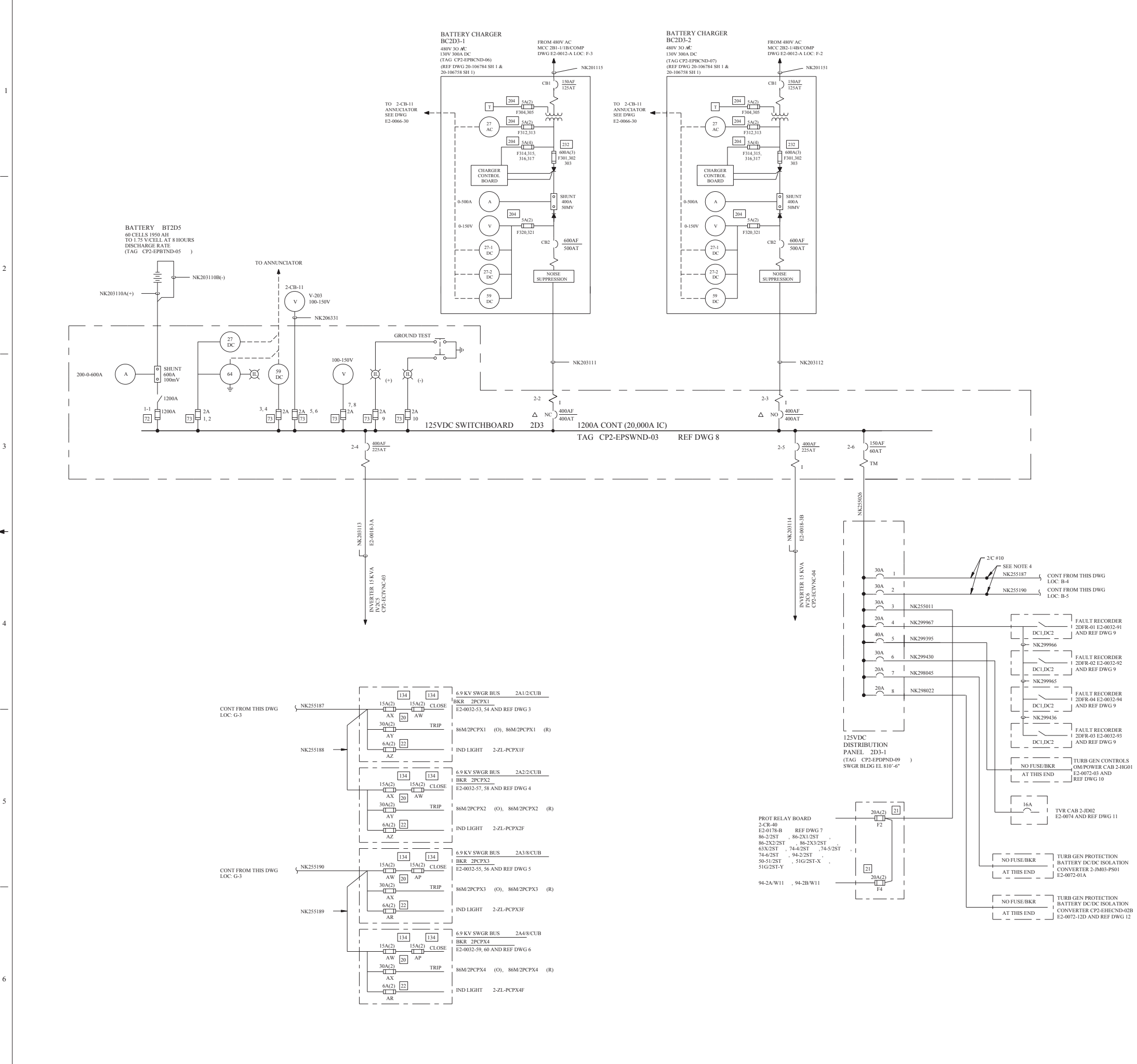
1. E1-2400-361	
2. 33-51261-E508	
3. 33-51261-E528	
4. 33-51261-E543	
5. 33-51261-E563	
6. E1-0024-04	
7. P.O. #802820426D6	MEHTA TECH VENDOR MANUAL
8. D1-HWEHC (1HG01W002)	SIEMENS CONNECTION DIAGRAM
9. D1-HWTVR (YX-001)	SIEMENS CONNECTION DIAGRAM
10. D1-HWTS1	ZEEFAX REF DWG
11. D1-HWEHC (1JC42W002)	SIEMENS CONNECTION DIAGRAM
12. D-7460 SH 02	

DRAWING	E1-0018-03	REV	CP-6
HAS BEEN SPLIT INTO THE FOLLOWING SHEETS:			
E1-0018-03			
E1-0018-03A			
E1-0018-03B			

**NON-SAFETY**  
LUMINANT  
CPNPP  
GLEN ROSE, TEXAS

125V DC SWITCHBOARD ID3  
ONE LINE DIAGRAM

DWG NO.	E1-0018	SH NO.	03	REV.	CP-25
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REV	DWN	CHKD	APPVD	REMARKS
CP14	10-22-2006	10-22-2006		THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2004-000773-20-00 PER SK-0012-04-000773-20-00

**FSAR FIGURE 8.3-15C**

**LEGEND**

- VOLTMETER
- OVERVOLTAGE RELAY, DC
- UNDERVOLTAGE RELAY, DC
- AMMETER
- UNDERVOLTAGE RELAY, AC
- GROUND DETECTION RELAY
- INDICATING LIGHT
- EQUALIZING CHARGE TIMER
- FUSIBLE DISCONNECT SWITCH (SEE NOTE 2)
- CIRCUIT BREAKER  
AF - FRAME SIZE  
AT - TRIP RATING
- ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP
- ELECTROSTATICALLY SHIELDED TRANSFORMER
- THERMAL MAGNETIC
- INDICATES BREAKERS MECHANICALLY INTERLOCKED TO PREVENT PARALLELING
- FUSE  
1A - FUSE RATING  
F7,8 - FUSE B/M ITEM NUMBER (REF DWG 2)  
F7,8 - FUSE LOCATION MARKER

**NOTES**

- ALL CIRCUIT BREAKERS ARE THERMAL MAGNETIC UNLESS OTHERWISE NOTED.
- ALL FUSIBLE DISCONNECT SWITCHES ARE 3-POLE, ONE POLE BEING USED TO MONITOR SWITCH STATUS. BLOWN FUSE INDICATION IS PROVIDED BY TRIGGER FUSES WIRED IN PARALLEL WITH EACH POWER FUSE.
- 225 FRAME SIZE AND LARGER FRAME SIZE BREAKERS HAVE INTERCHANGEABLE TRIP UNIT WITH ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP. FOR SETTING SEE REFERENCE DWG 1.
- CABLE CONDUCTOR SIZE SHALL BE REDUCED AT THE BREAKER PANEL BY SPLICING CONDUCTORS WITH EXTENSION CONDUCTORS (2 FEET MAX LENGTH) STRIPPED FROM 2/C #10 AWG CABLE (0W-027) ENABLING TERMINATIONS TO BE MADE AT 30A BREAKERS. THE SPLICES SHALL BE MADE IN ACCORDANCE WITH 2323-ES-100.

**REFERENCE DRAWINGS**

- E2-2400-361
- E2-0024-04 (LATER)
- 33-51261-E1584
- 33-51261-E1561
- 33-51261-E2487
- 33-51261-E2508
- D-7461 SH 1, 2 AND 3
- DB82-18479-1
- P.O.# SC232042GD6.
- 2HG01W002-01
- 3SE-A33-959-9140.30-SP-2 SH 2
- D2-HWTSI

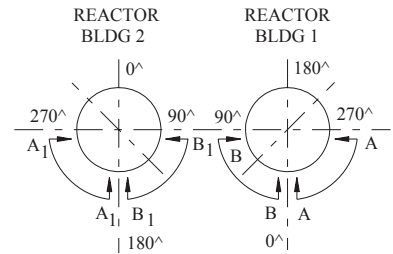
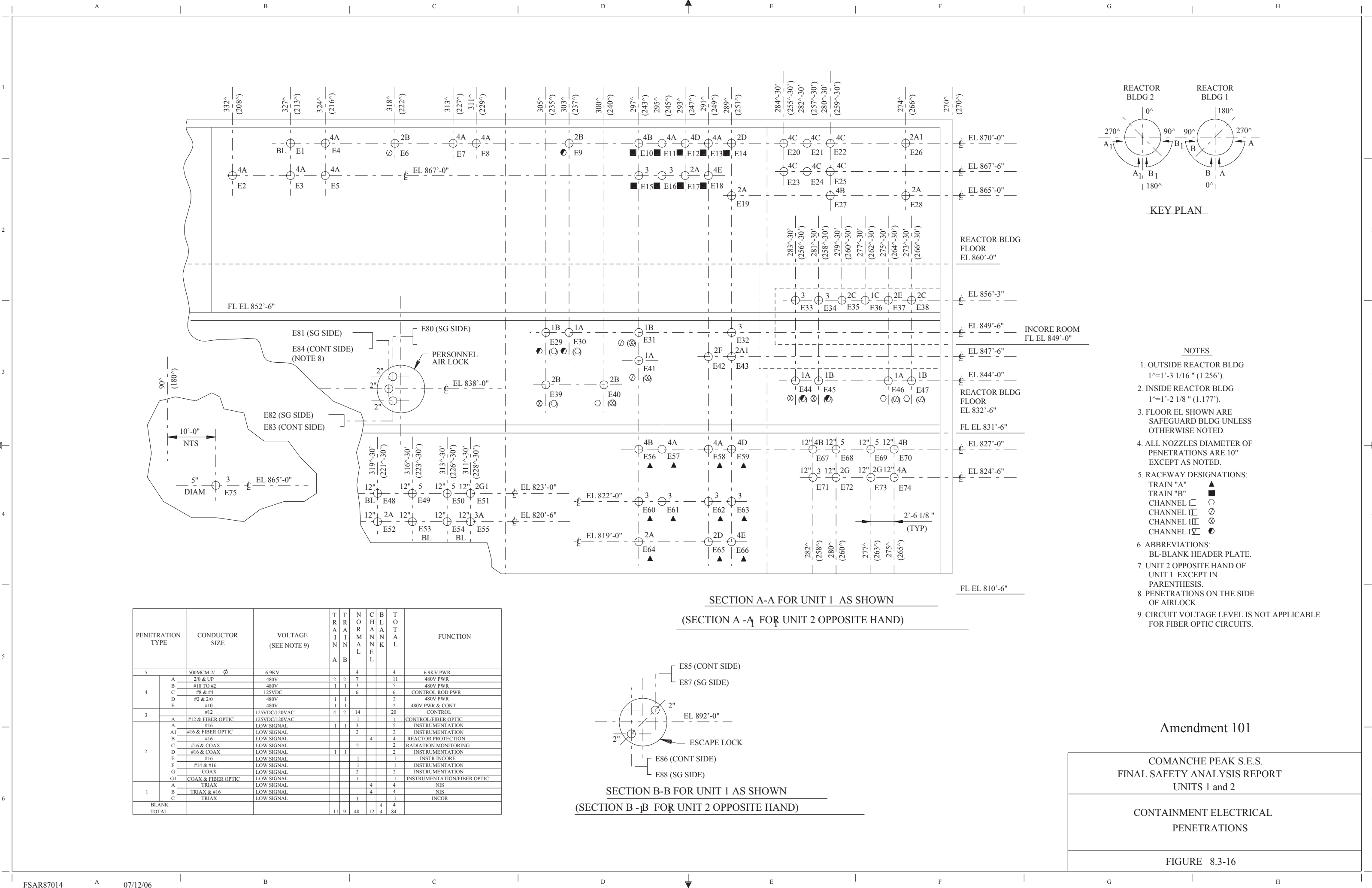
MEHTA TECH VENDOR MANUAL  
SIEMENS CIRCUIT DIAGRAM  
SIEMENS CONNECTION DRAWING  
ZEEFAAX DRAWING

DWG NO	SH NO	REV
E2-0018	03	CP-14

**NON-SAFETY**

**TXU POWER  
CPSES  
GLEN ROSE, TEXAS**

**PLANT COMPUTER  
125VDC  
ONE LINE DIAGRAM**

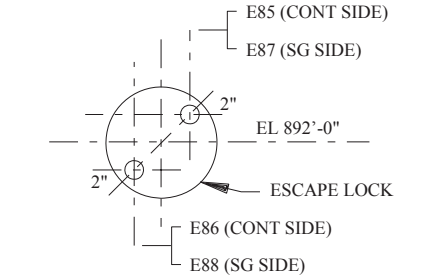


KEY PLAN

- NOTES**
1. OUTSIDE REACTOR BLDG  
1"=1'-3 1/16" (1.256').
  2. INSIDE REACTOR BLDG  
1"=1'-2 1/8" (1.177').
  3. FLOOR EL SHOWN ARE SAFEGUARD BLDG UNLESS OTHERWISE NOTED.
  4. ALL NOZZLES DIAMETER OF PENETRATIONS ARE 10" EXCEPT AS NOTED.
  5. RACEWAY DESIGNATIONS:  
TRAIN "A" ▲  
TRAIN "B" ■  
CHANNEL I □  
CHANNEL II ⊙  
CHANNEL III ⊗  
CHANNEL IV ⊕
  6. ABBREVIATIONS:  
BL-BLANK HEADER PLATE.
  7. UNIT 2 OPPOSITE HAND OF UNIT 1 EXCEPT IN PARENTHESIS.
  8. PENETRATIONS ON THE SIDE OF AIRLOCK.
  9. CIRCUIT VOLTAGE LEVEL IS NOT APPLICABLE FOR FIBER OPTIC CIRCUITS.

PENETRATION TYPE	CONDUCTOR SIZE	VOLTAGE (SEE NOTE 9)	TRAIN		CHANNEL	BLANK	TOTAL	FUNCTION
			A	B				
5	500MCM 2/ ∅	6.9KV		4			4	6.9KV PWR
4	A 2/0 & UP	480V	2	2	7		11	480V PWR
	B #10 TO #2	480V	1	1	3		5	480V PWR
	C #8 & #4	125VDC			6		6	CONTROL ROD PWR
	D #2 & 2/0	480V	1	1			2	480V PWR
	E #10	480V	1	1			2	480V PWR & CONT
3	#12	125VDC/120VAC	4	2	14		20	CONTROL
	A #12 & FIBER OPTIC	125VDC/120VAC			1		1	CONTROL/FIBER OPTIC
	A1 #16	LOW SIGNAL	1	1	3		5	INSTRUMENTATION
	B #16 & FIBER OPTIC	LOW SIGNAL			2		2	INSTRUMENTATION
	B #16	LOW SIGNAL			4		4	REACTOR PROTECTION
	C #16 & COAX	LOW SIGNAL			2		2	RADIATION MONITORING
	D #16 & COAX	LOW SIGNAL	1	1			2	INSTRUMENTATION
	E #16	LOW SIGNAL			1		1	INSTR INCORE
	F #14 & #16	LOW SIGNAL			1		1	INSTRUMENTATION
	G COAX	LOW SIGNAL			2		2	INSTRUMENTATION
G1 COAX & FIBER OPTIC	LOW SIGNAL			1		1	INSTRUMENTATION/FIBER OPTIC	
1	A TRIAX	LOW SIGNAL			4		4	NIS
	B TRIAX & #16	LOW SIGNAL			4		4	NIS
	C TRIAX	LOW SIGNAL			1		1	INCOR
BLANK TOTAL			11	9	48	12	4	84

SECTION A-A FOR UNIT 1 AS SHOWN  
(SECTION A -A1 FOR UNIT 2 OPPOSITE HAND)



SECTION B-B FOR UNIT 1 AS SHOWN  
(SECTION B -B1 FOR UNIT 2 OPPOSITE HAND)

**Amendment 101**

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

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CONTAINMENT ELECTRICAL  
PENETRATIONS

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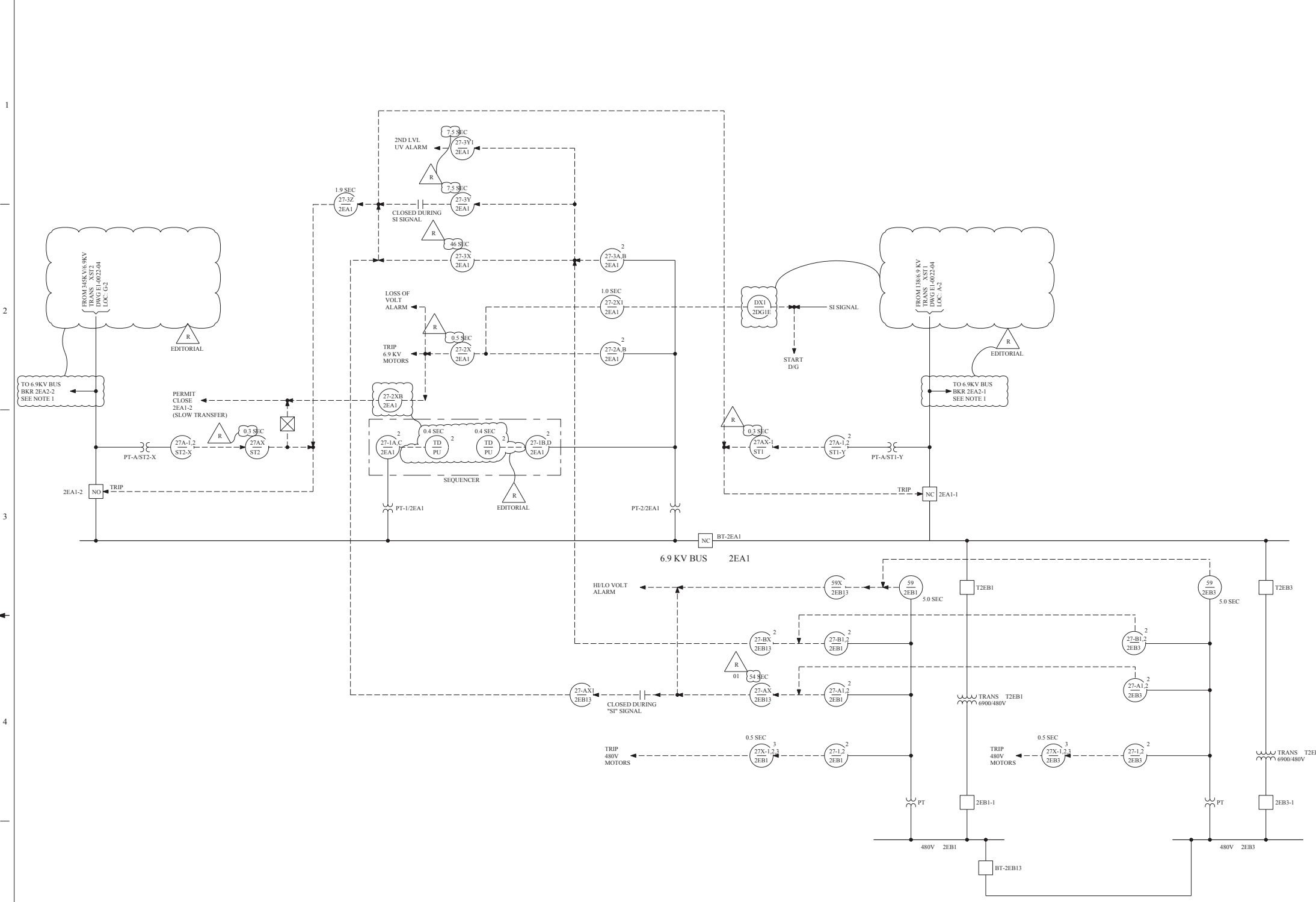
FIGURE 8.3-16











REV	DWN	CHK	APPV	REMARKS
CP-5	CA	TK	APV	THIS DRAWING REVISED TO INCORPORATE DESIGN CHANGE FDA-2002-003579-01-02 PER 98-0002-02-003579-01-01 EDITORIAL CHANGES AS NOTED

**FSAR FIGURE 8.3-18**

**LEGEND**

- BREAKER
- RELAY
- POTENTIAL TRANSFORMER
- POWER TRANSFORMER
- ELECTRICAL SIGNAL
- INDICATES A DEVICE WHICH PRODUCES AN OUTPUT ONLY WHEN THE INPUT IS NOT ENERGIZED

**NOTES**

- THIS DIAGRAM IS SHOWN FOR TRAIN A, TRAIN B WILL BE SIMILAR
- METER/RELAY NUMBER SUFFIXES ARE NOT ALWAYS SHOWN. THE SUFFIXES ARE THE ALTERNATE TAG FOR THAT PIECE OF EQUIPMENT THAT IT IS ASSOCIATED WITH (eg. 59/2EB3 ) FOR THOSE METER/RELAY REPRESENTATIONS CONTAINING THE COMPLETE TAG NUMBER THE UNDERBAR IS EQUIVALENT TO A SLASH (eg. 59/2EB3) EQUIVALENT TO 59/2EB1
- FOR RELAY SETTING SEE REFERENCE DWG 7.

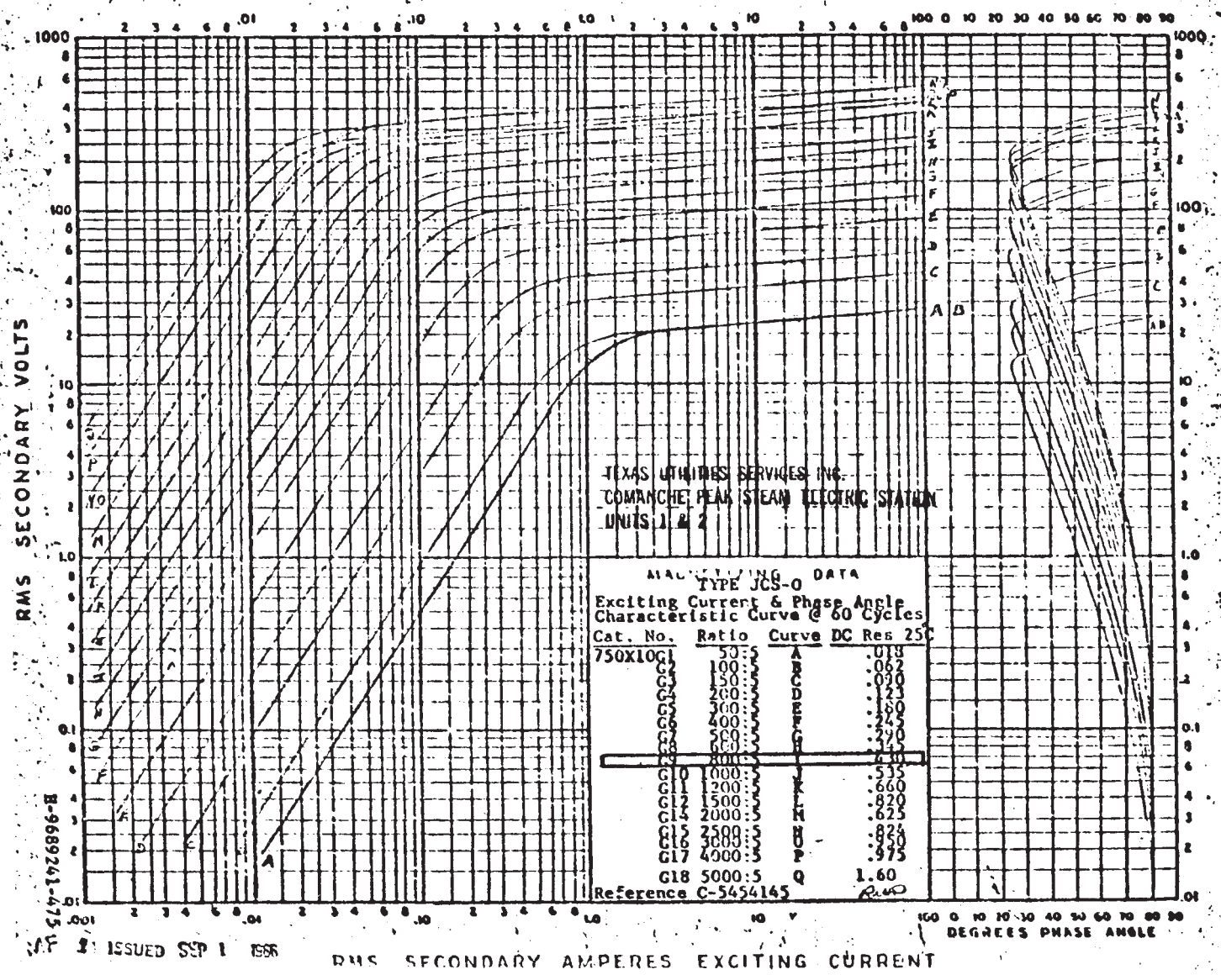
**REFERENCE DRAWINGS**

- E2-0004 6.9 KV ONE LINE SAFEGUARD BUS, UNIT 2
- E2-0005 480V ONE LINE SAFEGUARD BUS, UNIT 2
- E2-0030 6.9 KV SCHEMATIC DIAGRAMS
- E2-0031 6.9 KV SCHEMATIC DIAGRAMS
- E2-0033 480V SCHEMATIC DIAGRAMS
- E2-0022-03 UNDER/OVER VOLTAGE PROTECTION LOGIC DIAGRAM FOR CLASS 1E 6.9 KV/480V BUSES
- E2-2400 PROTECTIVE RELAY SETTINGS

**Amendment 104**

<b>CLASS I</b> (NUCLEAR SAFETY-RELATED)	
SAFETY CLASS 1	SEISMIC CATEGORY I
SAFETY CLASS 2	CLASS 1E
SAFETY CLASS 3	ASSOCIATED CIRCUITS
<b>TXU POWER</b> CPSES GLEN ROSE, TEXAS	
UNDER/OVER VOLTAGE RELAY PROTECTION FOR CLASS 1E 6.9 KV/480V BUSES	
DWG NO. E2-0022	REV. 04 CP-5

H-9689241-475



POWER DEPARTMENT

GENERAL ELECTRIC

COMANCHE PEAK STEAM ELECTRIC STATION

H-9689241-475

POWER SWORTH, N.H.

8/11/88

COMANCHE PEAK S.E.S.  
FINAL SAFETY ANALYSIS REPORT  
UNITS 1 and 2

EXCITATION CHARACTERISTIC  
CURVE FOR DIESEL GENERATOR

FIGURE 8.3-19

Amendment 91  
April 15, 1994

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