TU ELECTRIC

Log # TXX-89577
File # 10010
908.3
Ref. # 10CFR50.34(b)

August 15, 1989

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
ADVANCE FSAR SUBMITTAL
UPGRADE AND ADDITION OF CLASS 1E ELECTRICAL EQUIPMENT IN THE PRIMARY PLANT VENTILATION SYSTEM TO MAINTAIN NEGATIVE PRESSURE

REF.: TXX-89133 dated March 10, 1989

Gentlemen:

This letter provides an advance copy of changes to be included in a future FSAR amendment dealing with the upgrading of two Primary Plant Ventilation Exhaust Fans to Class 1E and the addition of two Primary Plant ESF Heaters in the Primary Plant Ventilation System. This change updates the FSAR for the design commitments made in the referenced letter.

In order to facilitate NRC staff review of these changes, the enclosure is organized as follows:

1. Draft revised FSAR pages, with changed portions indicated by a bar in the margin, as they are to appear in a future amendment (additional pages immediately preceeding and/or following the revised pages are provided if needed to understand the change). Where the draft version is not available, a hand marked-up version is supplied.

2. A line-by-line description/justification of each item revised.

3. A copy of related SER/SSER sections.

4. An index page containing the title of "bullets" which consolidates and categorizes similar individual changes by subject and related SER section.

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5. The bold/overstrike version of the revised FSAR pages referenced by the description/justification for each item identified above. The bold/overstrike version facilitates review of the revisions by highlighting each addition of new text in bold type font and overstriking with a slash (/) the portion of the text that is deleted. Hand marked-up versions provided in Section 1 of the enclosure are not duplicated in this section.

If you have any questions regarding this submittal please contact Joe Harnden at (214) 812-8226.

Sincerely,

William J. Cahill, Jr.

WJH/smp
Enclosure

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)

Enclosure to TXX-89577
August 15, 1989

Advance FSAR Change Regarding the Upgrade and Addition of Class 1E Electrical Equipment in the Primary Plant Ventilation System to Maintain Negative Pressure

CPSES/FSAR
TABLE 8.3-1A
(SHEET 4 OF 8)

LOADING REQUIREMENTS FOR LOSS-OF-COOLANT ACCIDENT COINCIDENT WITH LOSS OF OFFSITE POWER
INJECTION PHASE (7)

*EQUIPMENT DESCRIPTION & TAG NUMBER	NAMEPLATE HP (KW/KVA/A IF INDICATED)	AUTO SEQUENCER START	START TIME AFTER SIAS (SEC) (1)	NUMBER REQUIRED PER TRAIN	BHP (KW, KVA IF INDICATED)	DEMAND KVA (12)	DEMAND KW (12)	BASIS FOR KW REQD.	TIME TO STOP
CONTAINMENT SPRAY PUMP ROOM FAN CP1-VAAUSE-12, 14 (CP1-VAAUSE-11, 13)	3	YES	25 (10)	2	6	7.5	6.3	(c)	(4)
COMPONENT COOLING WATER PUMP CP1-CCAPCC-02 (CP1-CCAPCC-01)	1000	YES	30	1	1000	------	785	(b)	(4)
COMPONENT COOLING WATER PUMP ROOM FAN COOLER CP1-VAAUSE-10 (CP1-VAAUSE-09)	3	YES	30 (10)	1	3	3.7	3.2	(c)	(4)
STATION SERVICE WATER PUMP CP1-SWAPSW-02 (CP1-SWAPSW-01)	900	YES	35	1	880	------	706	(a)	(4)
AUXILIARY FEEDWATER PUMP CP1-AFAPMD-02 (CP1-AFAPMD-01)	700	YES	40	1	730 (8)	------	592	(a)	(4)
MOTOR DRIVEN FW PUMP ROOM FAN CP1-VAAUSE-08 (CP1-VAAUSE-07)	3	YES	40 (10)	1	3	3.9	3.3	(c)	(4)
PRIMARY PLANT VENT EXHAUST FAN (2) CPX-VAFNCE-06 (22) (CPX-VAFNCE-07 (21))	60	YES	40 (10)	x2	120 ~~60~~	99 ~~49.5~~	84.2 ~~42.1~~	(c)	(5)
PRIMARY PLANT VENT HEATER (2) CPX-VAFUPH-02 (16) (CPX-VAFUPH-01 (15))	100 KW	YES	40 (10)	x2	200 ~~100~~ KW	------	160 ~~80~~	(c)	(5)
HVAC CENTRIFUGAL WATER CHILLER CP1-CHCICE-06 (CP1-CHCICE-05)	154 KW	YES	75 (10)	1	154 KW	139.7	125.7	(c)	(5)
UPS AND DISTRIBUTION ROOM A/C UNIT (2) CPX-VAACUP-02 (CPX-VAACUP-01)	65.7 KVA	YES	90 (10)	1	65.7 KVA	52.5	44.6	(c)	(5)

CPSES/FSAR
TABLE 8.3-1A
(SHEET 7 OF 8)

LOADING REQUIREMENTS FOR LOSS-OF-COOLANT ACCIDENT COINCIDENT WITH LOSS OF OFFSITE POWER
INJECTION PHASE (7)

SUMMARY:

10 SECONDS LOAD DEMAND	=	1053.9 KW
15 SECONDS LOAD DEMAND	=	362.6 KW
20 SECONDS LOAD DEMAND	=	364.3 KW
25 SECONDS LOAD DEMAND	=	1074.3 KW
30 SECONDS LOAD DEMAND	=	788.2 KW
35 SECONDS LOAD DEMAND	=	706.0 KW
40 SECONDS LOAD DEMAND	=	~~785.1 KW~~ 839.5KW
75 SECONDS LOAD DEMAND	=	125.7 KW
90 SECONDS LOAD DEMAND	=	439.8 KW
120 SECONDS LOAD DEMAND	=	195.0 KW
AS REQUIRED LOAD DEMAND	=	7.3 KW
TOTAL		~~6034.9~~ 5956.6 KW (13)

CPSES/FSAR
TABLE 8.3-1B
(SHEET 4 OF 8)

LOADING REQUIREMENTS FOR LOSS-OF-COOLANT ACCIDENT COINCIDENT WITH LOSS OF OFFSITE POWER
RECIRCULATION PHASE (7)

*EQUIPMENT DESCRIPTION & TAG NUMBER	NAMEPLATE HP (KW/KVA/A IF INDICATED)	AUTO SEQUENCER START	START TIME AFTER SIAS (SEC) (1)	NUMBER REQUIRED PER TRAIN	BHP (KW, KVA IF INDICATED)	DEMAND KVA (12)	DEMAND KW (12)	BASIS FOR KW REQD.	TIME TO STOP
CONTAINMENT SPRAY PUMP CP1-CTAPCS-03, 04 (CP1-CTAPCS-01, 03)	700	YES	25	2	1360	------	1068	(a)	(4)
CONTAINMENT SPRAY PUMP ROOM FAN CP1-VAAUSB-12, 14 (CP1-VAAUSB-11, 13)	3	YES	25 (10)	2	6	7.5	6.3	(c)	(4)
COMPONENT COOLING WATER PUMP CP1-CCAPCC-02 (CP1-CCAPCC-01)	1000	YES	30	1	1000	------	785	(b)	(4)
COMPONENT COOLING WATER PUMP ROOM FAN COOLER CP1-VAAUSB-10 (CP1-VAAUSB-09)	3	YES	30 (10)	1	3	3.7	3.2	(c)	(4)
STATION SERVICE WATER PUMP CP1-SWAPSW-02 (CP1-SWAPSW-01)	900	YES	35	1	880	------	706	(d)	(4)
AUXILIARY FEEDWATER PUMP CP1-AFAPMD-02 (CP1-AFAPMD-01)	700	YES	40	1	750 (8)	------	592	(a)	(4)
MOTOR DRIVEN AFW PUMP ROOM FAN CP1-VAAUSB-08 (CP1-VAAUSB-07)	3	YES	40 (10)	1	1	1.9	1.1	(c)	(4)
PRIMARY PLANT VENT EXHAUST FAN (CPX-VAFNCB-08, 22) (CPX-VAFNCB-07, 21)	60	YES	40 (10)	~~2~~ 1	~~120~~ 60	~~99~~ 49.5	~~84.2~~ 42.1	(c)	(5)
PRIMARY PLANT ESF HEATER (CPX-VAFUPK-02, 16) (CPX-VAFUPK-01, 15)	100 KW	YES	40 (10)	~~2~~ 1	~~200 KW~~ 100 KW	------	~~160~~ 80	(c)	(5)
HVAC CENTRIFUGAL WATER CHILLER CP1-CHCICR-06 (CP1-CHCICR-05)	154 KW	YES	75 (10)	1	154	119.7	125.7	(c)	(5)

CPSES/FSAR
TABLE 8.3-1B
(SHEET 7 OF 8)

LOADING REQUIREMENTS FOR LOSS-OF-COOLANT ACCIDENT COINCIDENT WITH LOSS OF OFFSITE POWER
RECIRCULATION PHASE (7)

SUMMARY:

10 SECONDS LOAD DEMAND	=	1059.9 KW
15 SECONDS LOAD DEMAND	=	362.6 KW
20 SECONDS LOAD DEMAND	=	364.3 KW
25 SECONDS LOAD DEMAND	=	1074.3 KW
30 SECONDS LOAD DEMAND	=	788.2 KW
35 SECONDS LOAD DEMAND	=	706.0 KW
40 SECONDS LOAD DEMAND	=	~~717.4 KW~~ 839.5 KW
75 SECONDS LOAD DEMAND	=	125.7 KW
90 SECONDS LOAD DEMAND	=	439.8 KW
120 SECONDS LOAD DEMAND	=	195.0 KW
12 HOURS LOAD DEMAND	=	37.5 KW
5 DAYS LOAD DEMAND	=	43.8 KW
AS REQUIRED LOAD DEMAND	=	7.3 KW
TOTAL		~~5921.8 KW~~ (13) 6043.9 KW

EMERGENCY ELECTRICAL LOADING REQUIREMENTS FOR LOSS OF OFFSITE POWER (BLACKOUT) CONDITIONS

*EQUIPMENT DESCRIPTION & TAG NUMBER	NAMEPLATE HP (KW/KVA/A IF INDICATED)	AUTO SEQUENCER START	START TIME AFTER SIAS (SEC) (1)	NUMBER REQUIRED PER TRAIN	BHP (KW, KVA IF INDICATED)	DEMAND KVA (12)	DEMAND KW (12)	BASIS FOR KW REQD.	TIME TO STOP
UPS AND DISTRIBUTION ROOM BOOSTER RETURN FAN (2)									
CPX-VAFNAV-43 (CPX-VAFNAV-42)	20	YES	90 (10)	1	20	17.9	15.2	(c)	(5)
CONTROL ROOM A/C HEATER (2)									
CPX-VAACCR-03, 04 (CPX-VAACCR-01, 02)	30 KW	YES	90 (10)	2	------	------	48.0	(c)	(5)
CONTROL ROOM A/C UNIT (2)									
CPX-VAACCR-03, 04 (CPX-VAACCR-01, 02)	237.1 KVA	YES	90	2	------	379.4	322.5	(c)	(5)
ELECTRICAL AREA FAN									
CP1-VAAUSE-15, 16 (CP1-VAAUSE-17, 18)	5	YES	90	2	10	11.2	9.5	(c)	(4)
INSTRUMENT AIR COMPRESSOR									
CP1-CICACO-02 (CP1-CICACO-01)	100	YES	90	1	100	79.7	67.7	(c)	(4)
DG AIR COMPRESSOR									
CP1-MBCARD-03, 04 (CP1-MBCARD-01, 02)	30	NO	120 (10)	1	30	5.6	4.8	(c)	(5)
PRIMARY PLANT VENT EXHAUST FAN									
CPX-VAFNCB-04, 22 (CPX-VAFNCB-03, 21)	60	NO	120 (11)	2	120 ~~60~~	99 ~~49.5~~	84.2 ~~42.1~~	(c)	(5)
POSITIVE DISPLACEMENT CHARGING PUMP (16)									
NONE (TRX-CSAPPE-01)	------ 200	------ NO	------ 120 (11)	------ 1	------ 180	------ 168.5	------ 138.2	------ (c)	------ (4)
PRIMARY PLANT ESF HEATER									
CPX-VAFUPE-02, 16 (CPX-VAFUPE-01, 15)	100 KW	NO	120 (11)	2	200 KW ~~100 KW~~	------	160 ~~80~~	(c)	(5)
POSITIVE DISPLACEMENT CHARGING PUMP FAN COOLER									
NONE (CP1-VAFNCB-03)	------ 1.5	------ NO	------ 120(11)(17)	------ 1	------ 1.5	------ 2	------ 1.7	------ (c)	------ (4)

CPSES/FSAR
TABLE 8.3-2
(SHEET 9 OF 11)

EMERGENCY ELECTRICAL LOADING REQUIREMENTS FOR LOSS OF OFFSITE POWER
(BLACKOUT) CONDITIONS

SUMMARY:

10 SECONDS LOAD DEMAND	=	1170.7 KW
30 SECONDS LOAD DEMAND	=	877.7 KW
35 SECONDS LOAD DEMAND	=	706.0 KW
40 SECONDS LOAD DEMAND	=	595.3 KW
50 SECONDS LOAD DEMAND	=	215.5 KW
60 SECONDS LOAD DEMAND	=	206.0 KW
75 SECONDS LOAD DEMAND	=	125.7 KW
85 SECONDS LOAD DEMAND	=	537.3 KW
90 SECONDS LOAD DEMAND	=	507.5 KW
120 SECONDS LOAD DEMAND	=	~~135.1 KW~~ 255.2 KW
5 MINUTES LOAD DEMAND	=	4.9 KW
30 MINUTES LOAD DEMAND	=	174.0 KW
60 MINUTES LOAD DEMAND	=	485.0 KW
4 HOURS LOAD DEMAND	=	364.3 KW
AS REQUIRED DEMAND	=	7.3 KW
TOTAL		~~6110.9 KW~~ (13) 6232.9KW

CPSES/FSAR

TABLE 8.3-11

(Sheet 6)

NONSAFETY RELATED EQUIPMENT CONNECTED
TO SAFETY RELATED POWER CIRCUITS

EQUIPMENT ID NO.	DESCRIPTION	POWER SOURCE ID NO.		NOTE	
CPX-VAFNCB-04	CONTAINMENT HYDROGEN PURGE SUPPLY FAN 04	CPX-EPMCEB-02	3E	(1)	68
CPX-EPTRET-02	AUX BLDG ISOLATION TRANSFORMER TXEC2	CPX-EPMCEB-02	5BL	(5)	68
CPX-CHAPCP-01	VENT CHILLED WATER PUMP 1	CPX-EPMCEB-07	4M	(1)	68
CPX-VAFNAV-27	AUXILIARY BLDG VENT EQUIP ROOM EXHAUST FAN 27	CPX-EPMCEB-07	3M	(1)	68
					75
CPX-EPTRET-03	ISOLATION TRANSFORMER TXEC3	CPX-EPMCEB-07	1C	(5)	68
CPX-EPTRET-01	ISOLATION TRANSFORMER TXEC1	CPX-EPMCEB-07	1BR	(5)	68
CPX-CHAPCP-02	VENT CHILLED WATER PUMP 2	CPX-EPMCEB-08	3M	(1)	68
CPX-VAFNAV-28	AUXILIARY BLDG VENT EQUIP ROOM EXHAUST FAN 28	CPX-EPMCEB-08	4M	(1)	68
					75
X-RE-5568/75/67A	VENT STACK "1" RADIATION MONITOR SYS SAMPLE PUMP	CPX-EPMCEB-03	6C	(1)	68
CPX-VAFNCB-15	PRIMARY PLANT VENT EXHAUST FAN 15	CPX-EPMCEB-03	4G	(7)	76
CPX-VAFNCB-17	PRIMARY PLANT VENT EXHAUST FAN 17	CPX-EPMCEB-03	4M	(7)	76
CPX-VAFNCB-19	PRIMARY PLANT VENT EXHAUST FAN 19	CPX-EPMCEB-03	5G	(7)	76

68
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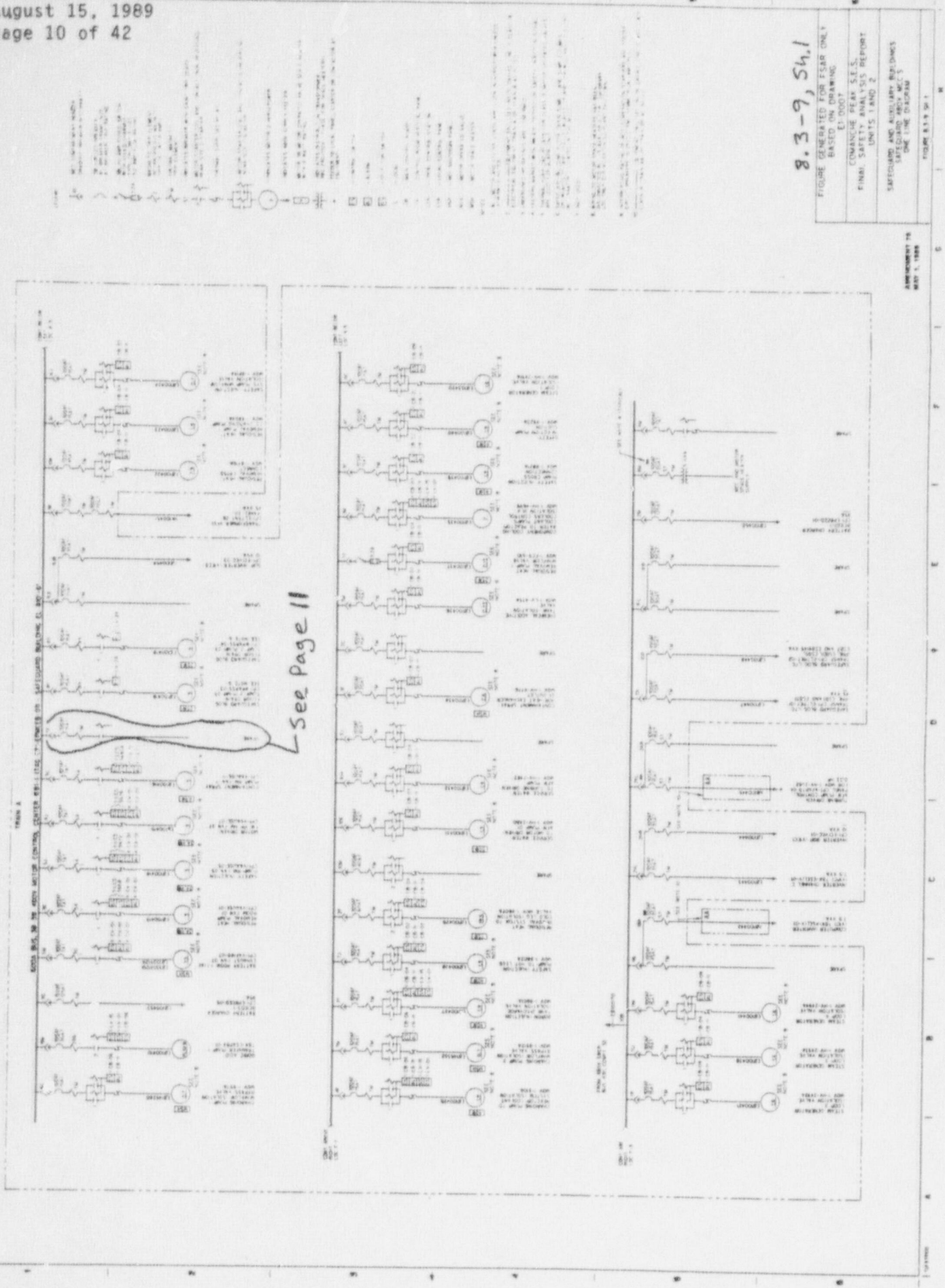
CPSES/FSAR

TABLE 8.3-11

(Sheet 7)

NONSAFETY RELATED EQUIPMENT CONNECTED
TO SAFETY RELATED POWER CIRCUITS

EQUIPMENT ID NO.	DESCRIPTION	POWER SOURCE ID NO.		NOTE	
CPX-CHCICE-01	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-03	5BL	(1)	68
CPX-CHCICE-03	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-03	5BR	(1)	68
X-RE-5568/75/67B	VENT STACK "2" RADIATION MONITOR SYS SAMPLE PUMP	CPX-EPMCEB-04	6G	(1)	68
CPX-VAFNCB-16	PRIMARY PLANT VENT EXHAUST FAN 16	CPX-EPMCEB-04	4G	(7)	76
CPX-VAFNCB-18	PRIMARY PLANT VENT EXHAUST FAN 18	CPX-EPMCEB-04	4M	(7)	76
CPX-VAFNCB-20	PRIMARY PLANT VENT EXHAUST FAN 20	CPX-EPMCEB-04	5G	(7)	76
					DRAFT
CPX-EPTRET-04	ISOLATION TRANSFORMER TXEC4	CPX-EPMCEB-04	7C	(5)	68
CPX-CHCICE-02	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-04	5BL	(1)	68
CPX-CHCICE-04	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-04	5BR	(1)	76
CP1-MEDGEE-01M	PRELUBE PUMP	CP1-EPMCEB-09	6M	(1)	68
CP1-MEDGEE-01L	JACKET WATER KEEP WARM PUMP	CP1-EPMCEB-09	7J	(1)	68
CP1-MEDGEE-01N	FUEL OIL BOOSTER PUMP	CP1-EPMCEB-09	7M	(1)	68
CP1-MEDGEE-01G	FUEL OIL DRIP RETURN PUMP	CP1-EPMCEB-09	8M	(1)	68
CP1-MECAED-01	COMPRESSOR AFTERCOOLER 1	CP1-EPMCEB-09	7C	(1)	68


8.3-9, Sh.1
See Page 11

PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

REQUEST NO. FS.3-116/89-528

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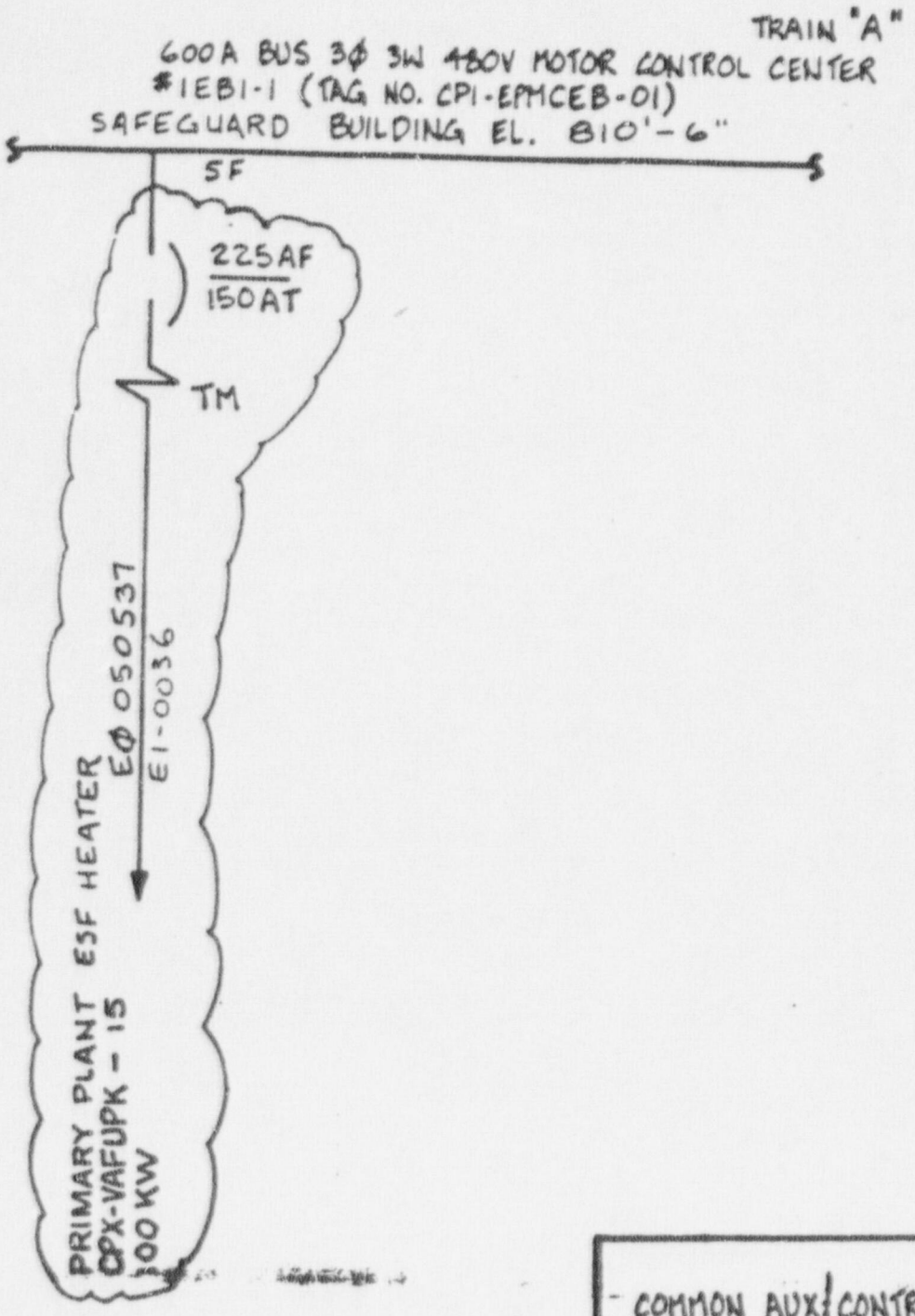

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-9 SHEET 1

8.3-9, Sh 3

EAK STEAM ELECTRIC STATION
ITINUATION SHEET

REQUEST NO. F8.3-116/89-528

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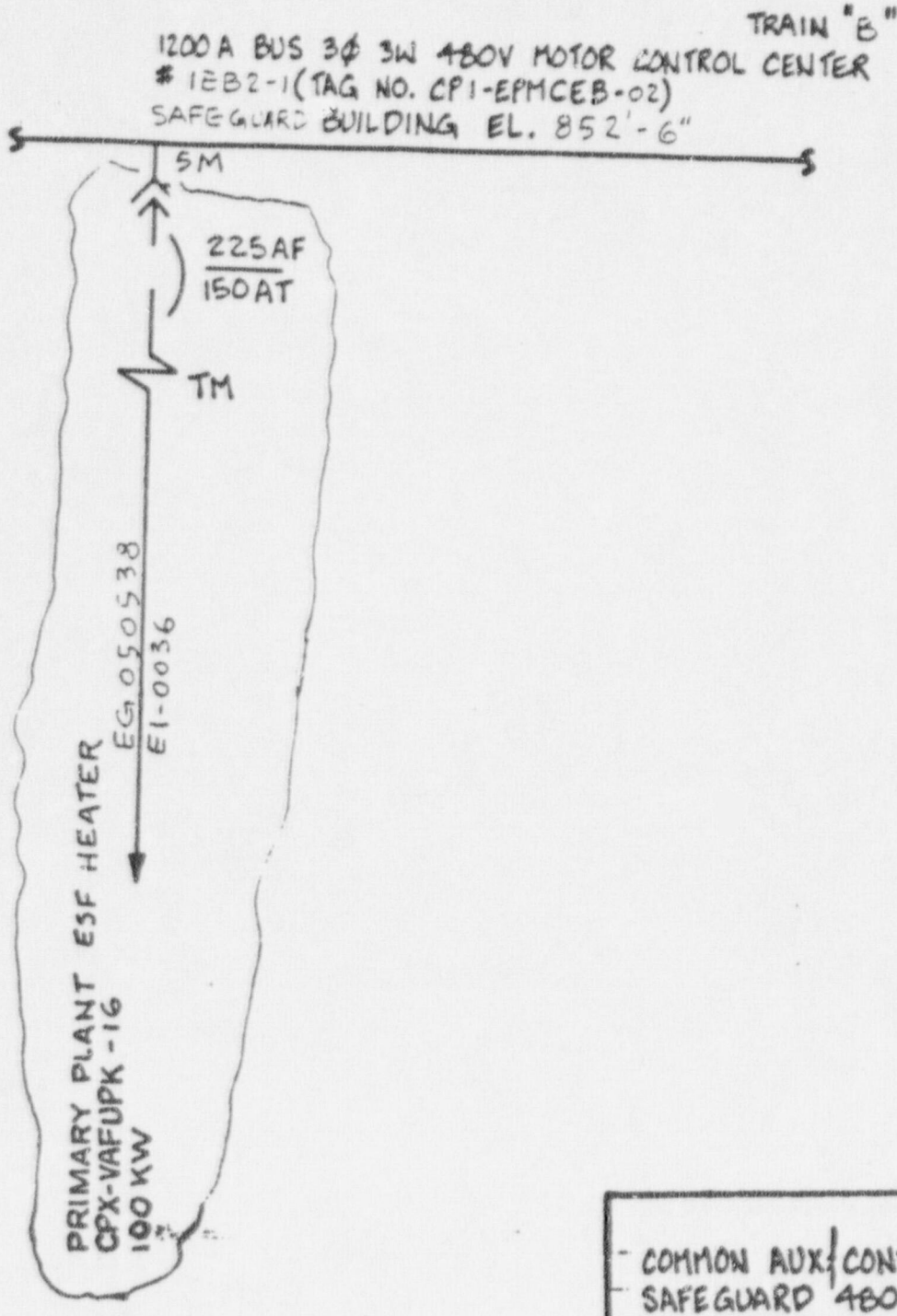

- COMMON AUX/CONTROL BLDG'S
- SAFEGUARD 480V MCC'S
- ONE LINE DIAGRAM

FIG. 8.3-9 SHEET 3

PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

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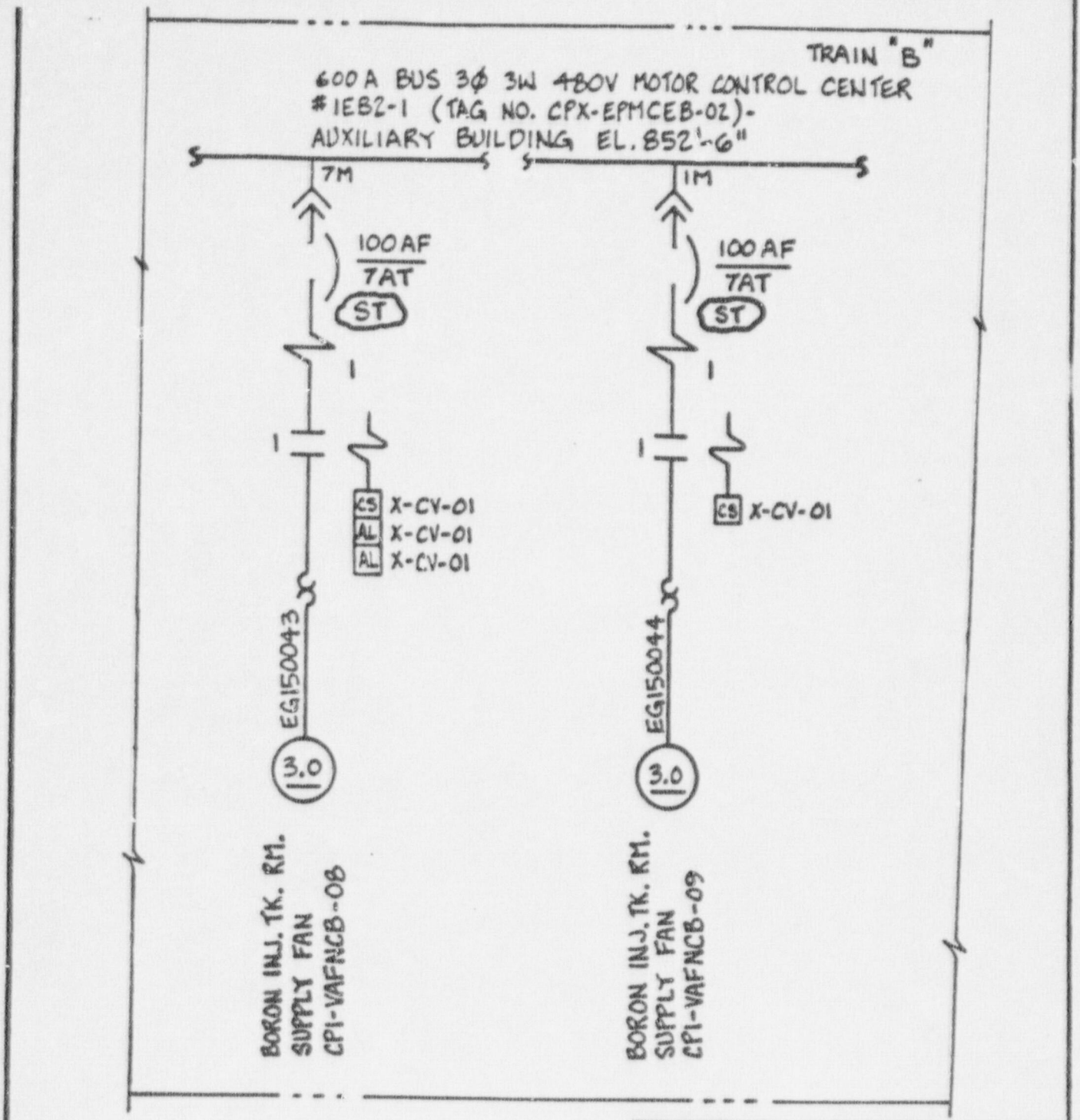

SAFEGUARD & AUXILIARY BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-9 SHEET 3

F8.3-112/89-416
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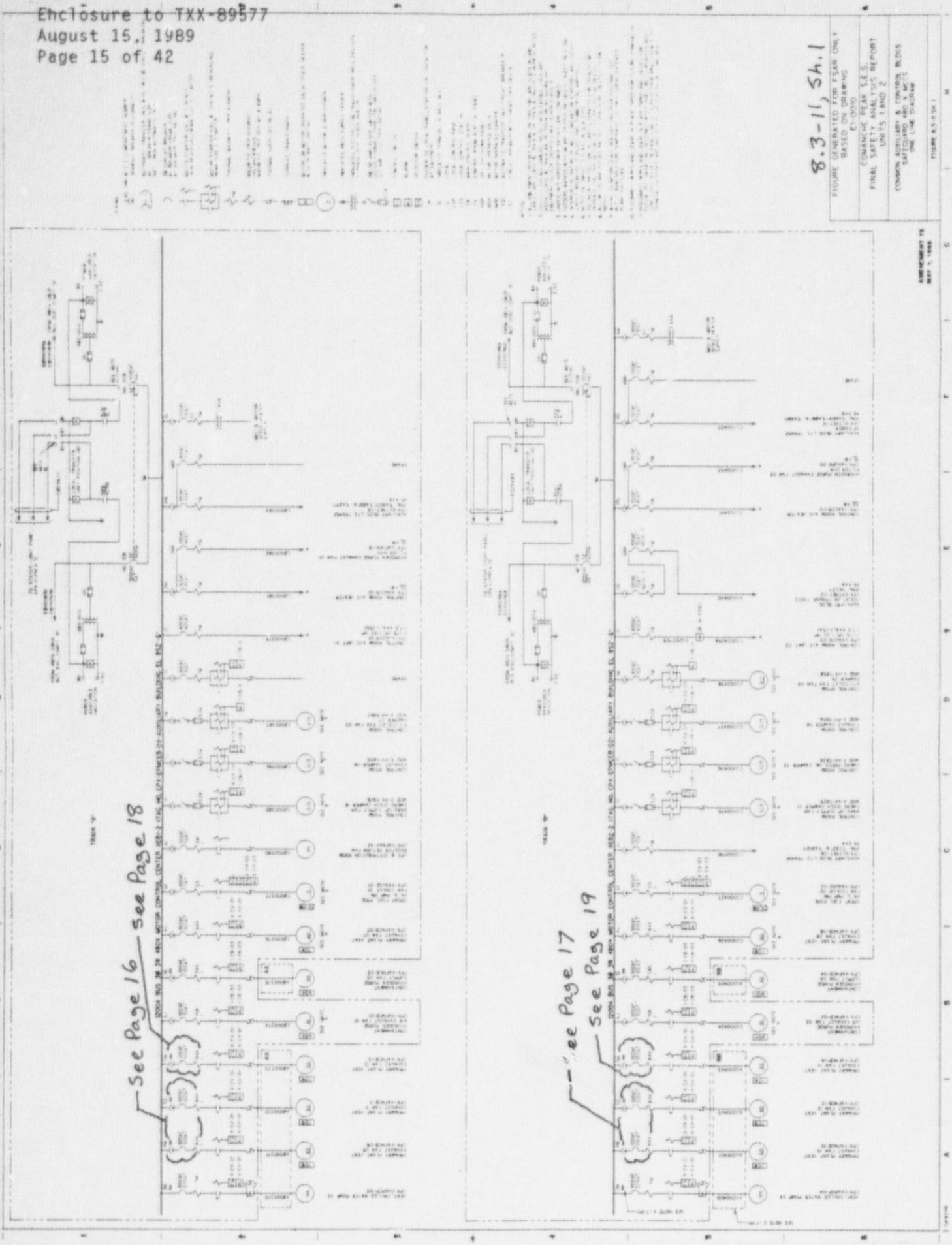
8.3-11, Sh. 1
See Page 16
See Page 18
See Page 17
See Page 19

PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

REQUEST NO.

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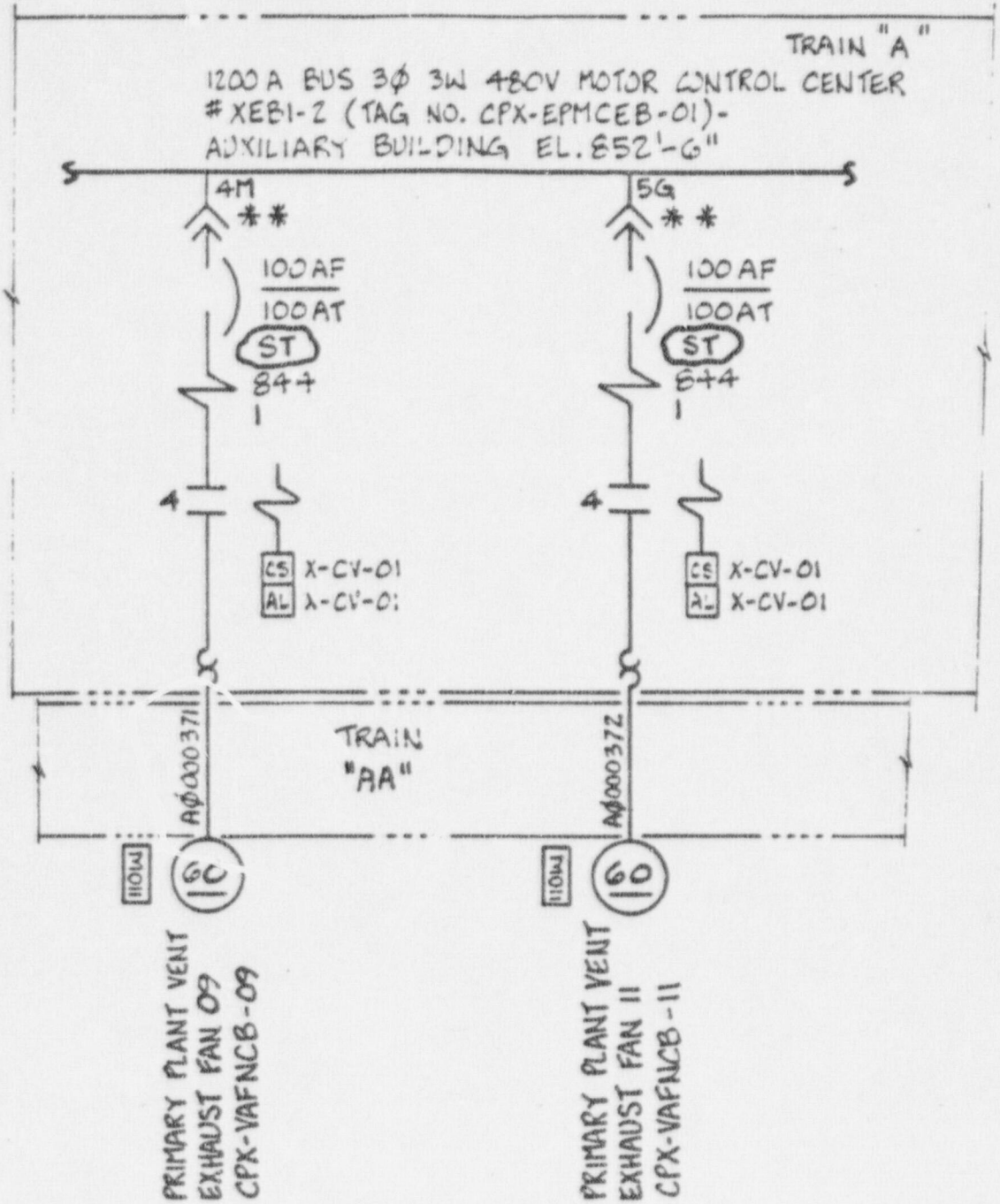

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 1

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PEAK STEAM ELECTRIC STATION
NTINUATION SHEET

REQUEST NO.

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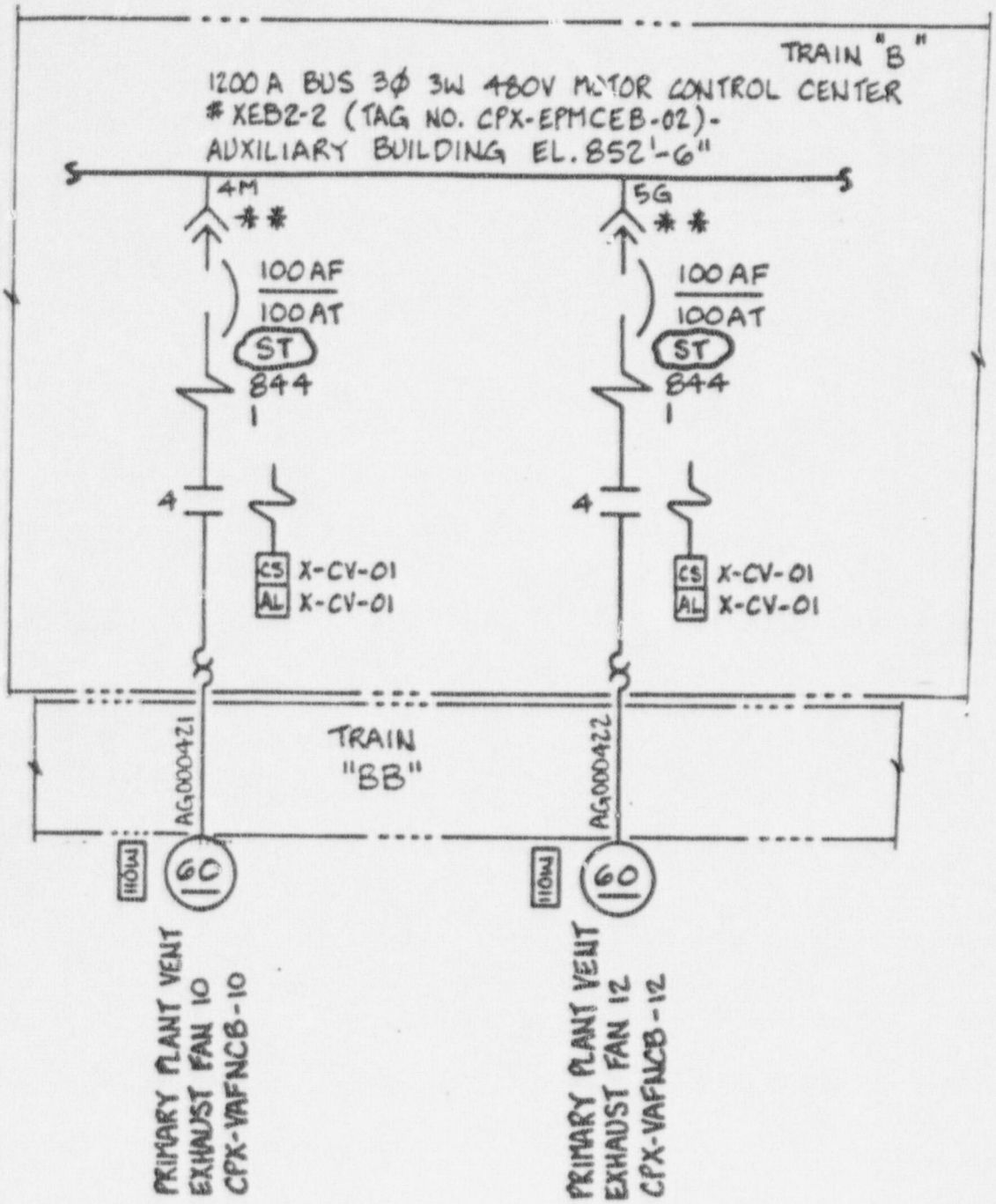

COMMON AUX & CONTROL BLDG'S
SAFEGUARD 480 V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 1

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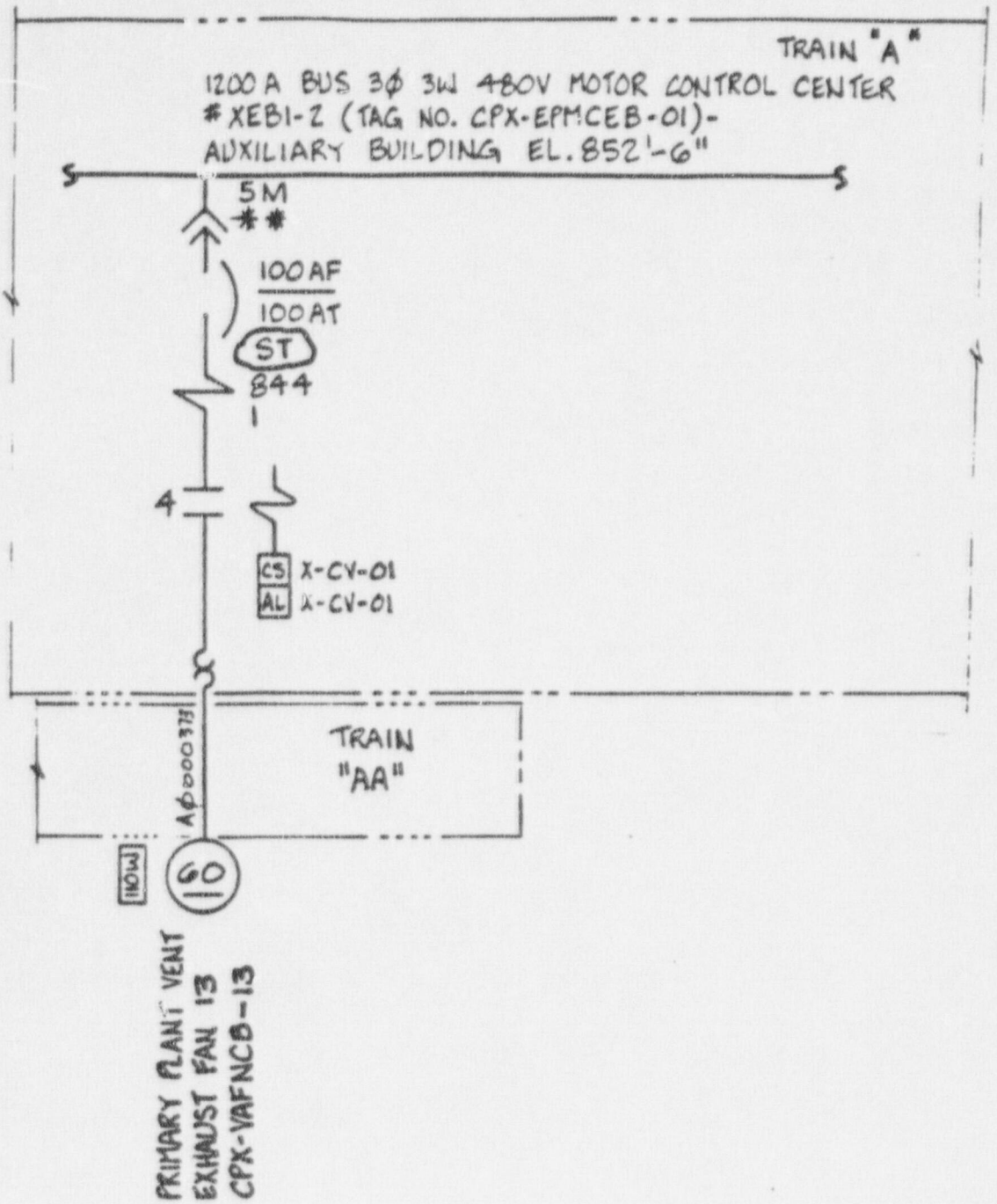
PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

REQUEST NO.



COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 1

FS.3-112/89-416
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PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

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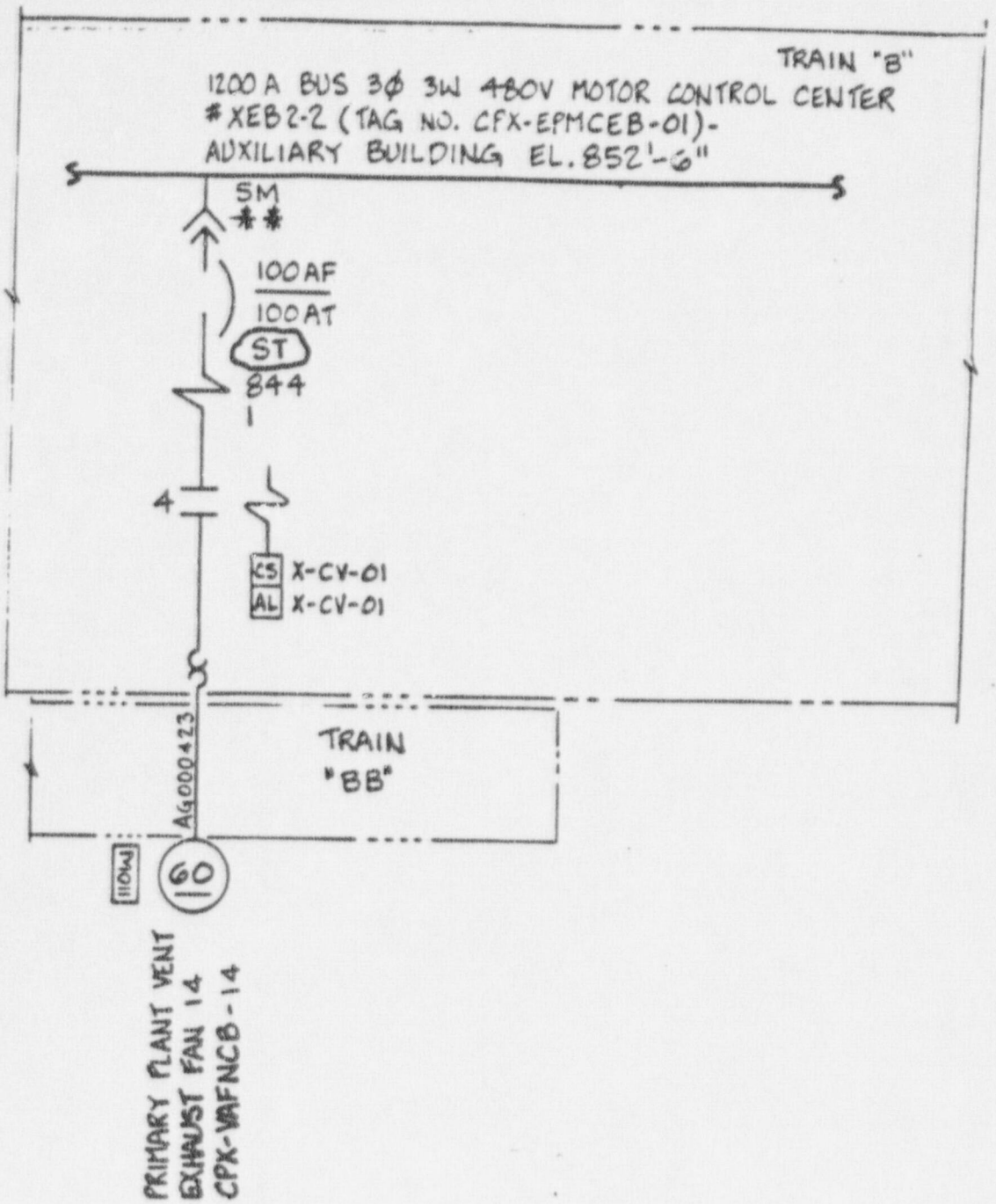

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 1

FP.3-112/89-416
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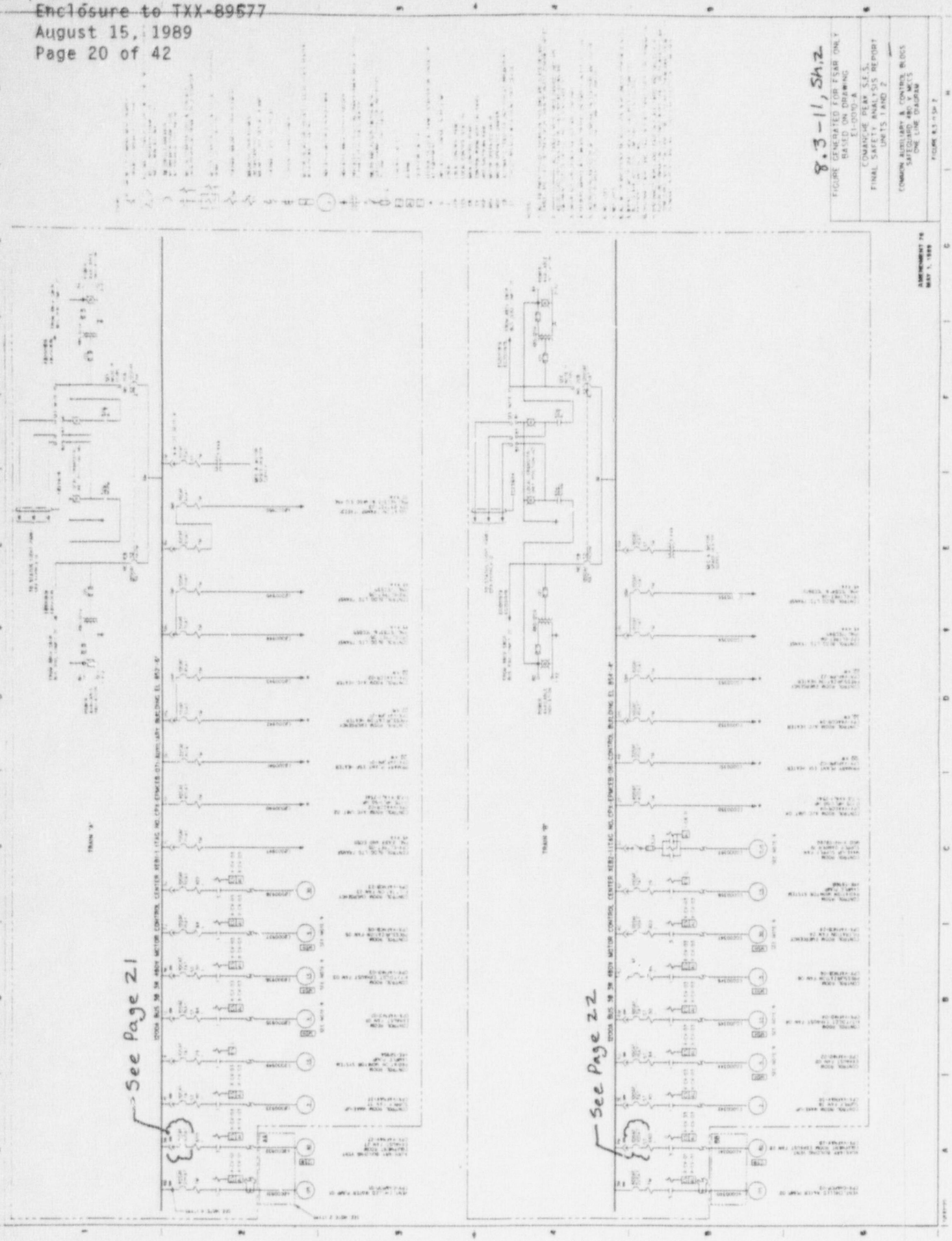
8.3-11, Sh.2
FIGURE GENERATED FOR FSAR ONLY BASED ON DRAWING E1-0010-A
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
COMANCHE AUXILIARY & CONTROL BLDGS SAFEGUARD AC & DC MCC'S ONE LINE DIAGRAM
FIGURE 8.3-1 SH 2
TRAIN 'A'
TRAIN 'B'
See Page 21
See Page 22

PEAK STEAM ELECTRIC STATION
NTINUATION SHEET

REQUEST NO.

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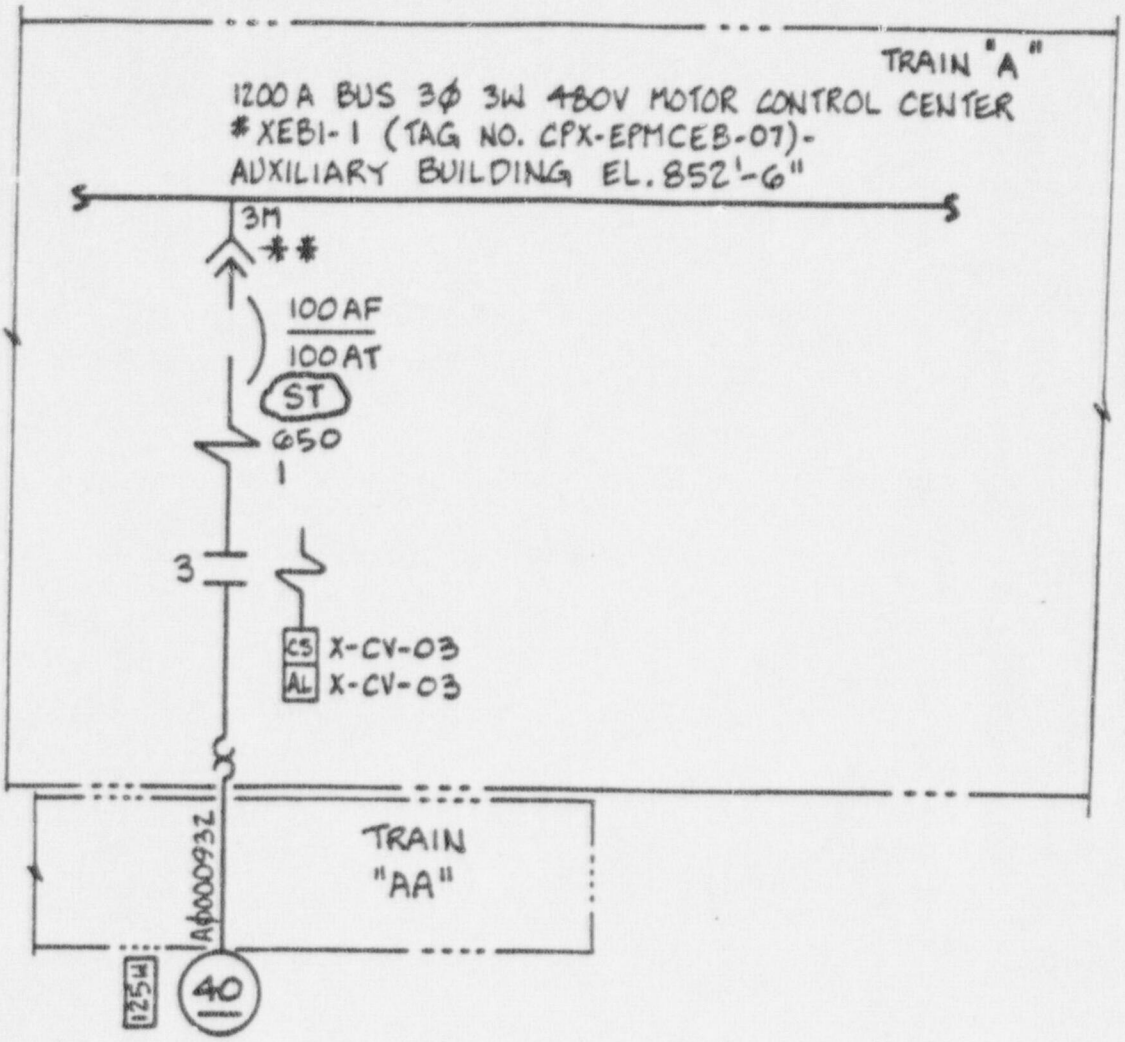

AUXILIARY BUILDING VENT
EQUIPMENT ROOM
EXHAUST FAN 27
CPX-VAFNAV-27

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 2

FQ.3-112/89-416
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PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

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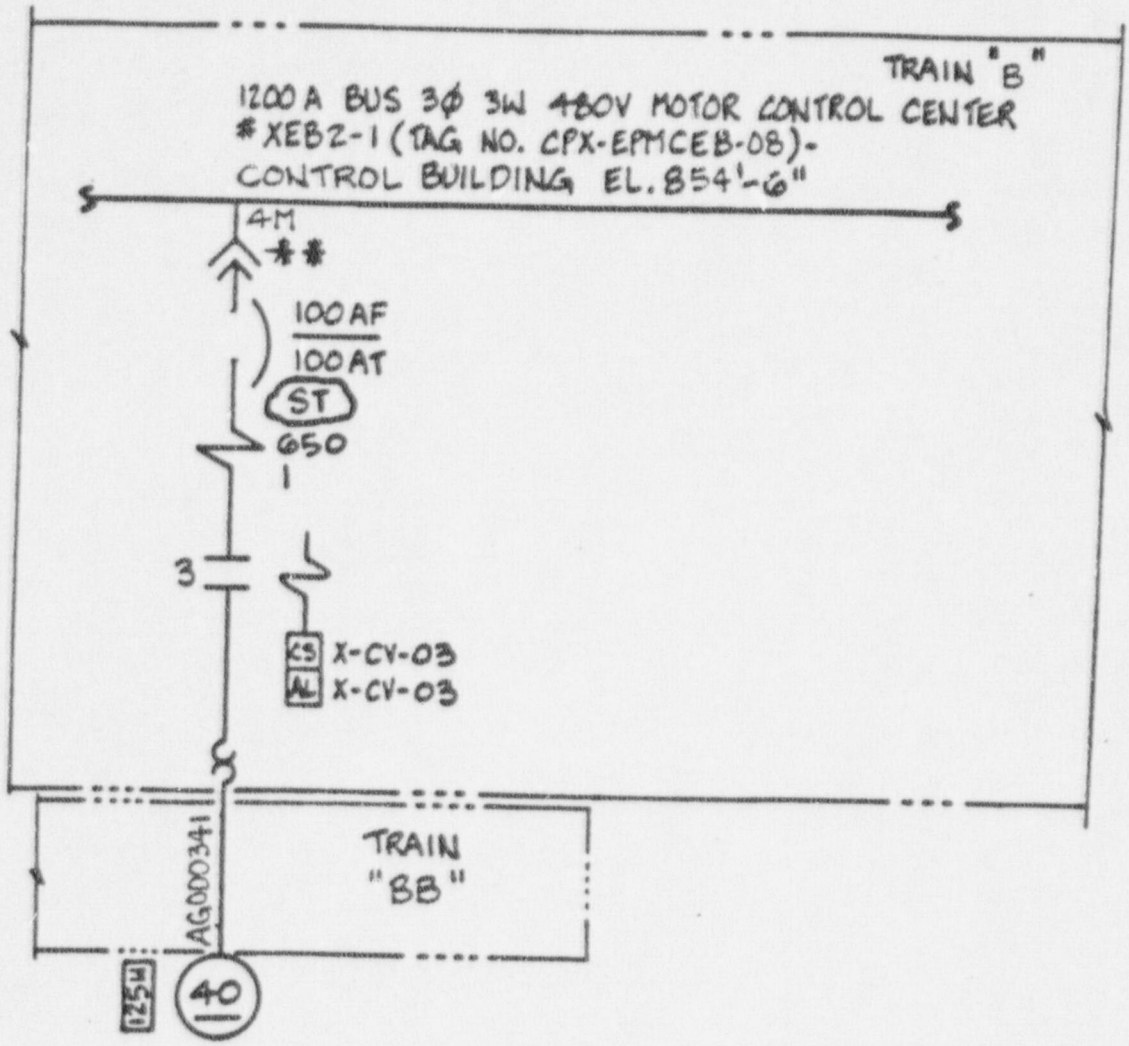

AUXILIARY BUILDING VENT EQUIPMENT ROOM EXHAUST FAN 2Ø CPX-VAFNAV-2Ø

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 2

F8.3-112/89-416
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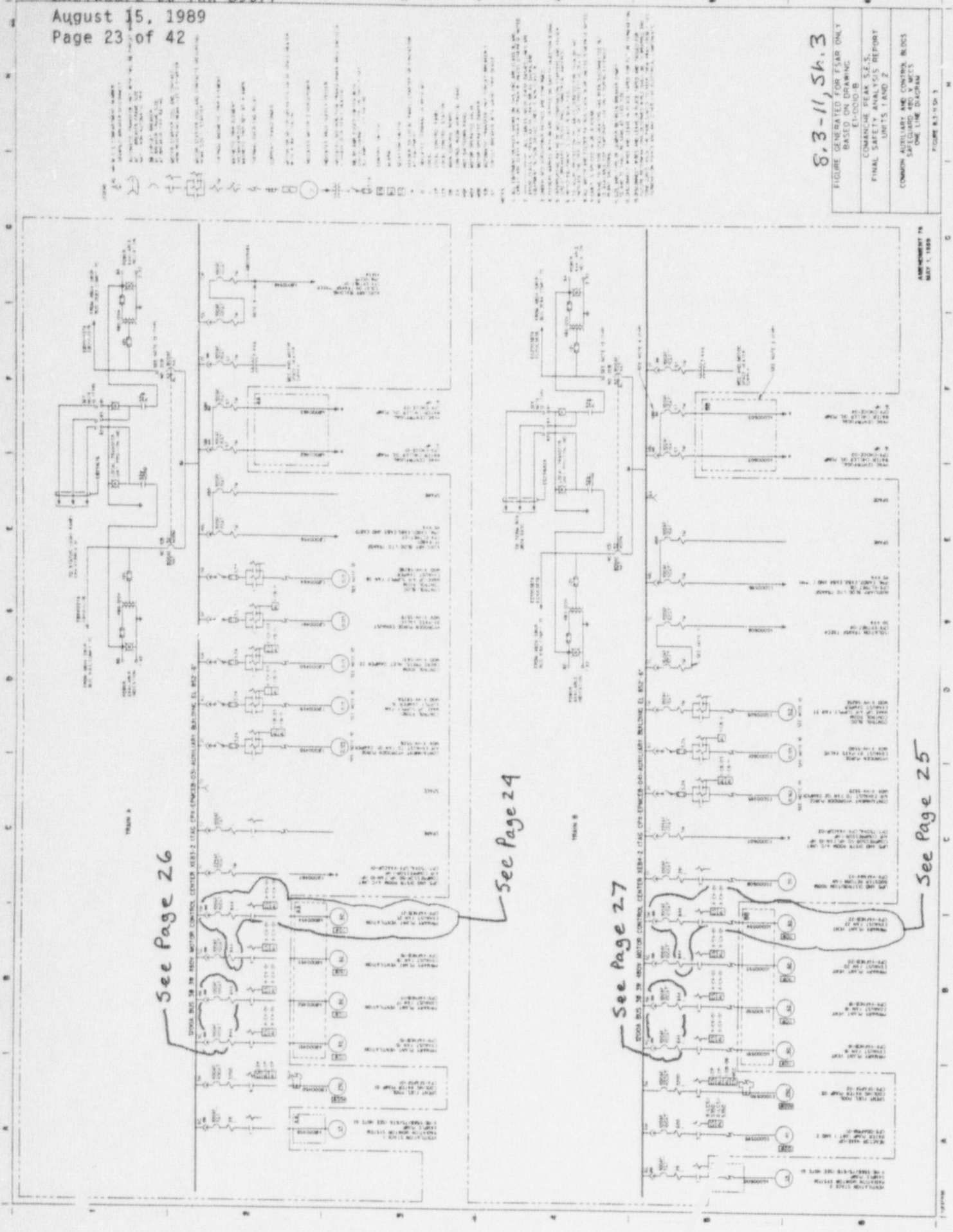
8.3-11, Sh. 3
FIGURE GENERATED FOR FSAR ONLY
BASED ON DRAWING
E1-0010-B
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2
CONDON AUXILIARY AND CONTROL BLDGS
SAFEGUARD 480 V MCCS
ONE LINE DIAGRAM
See Page 24
See Page 25
See Page 26
See Page 27

PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

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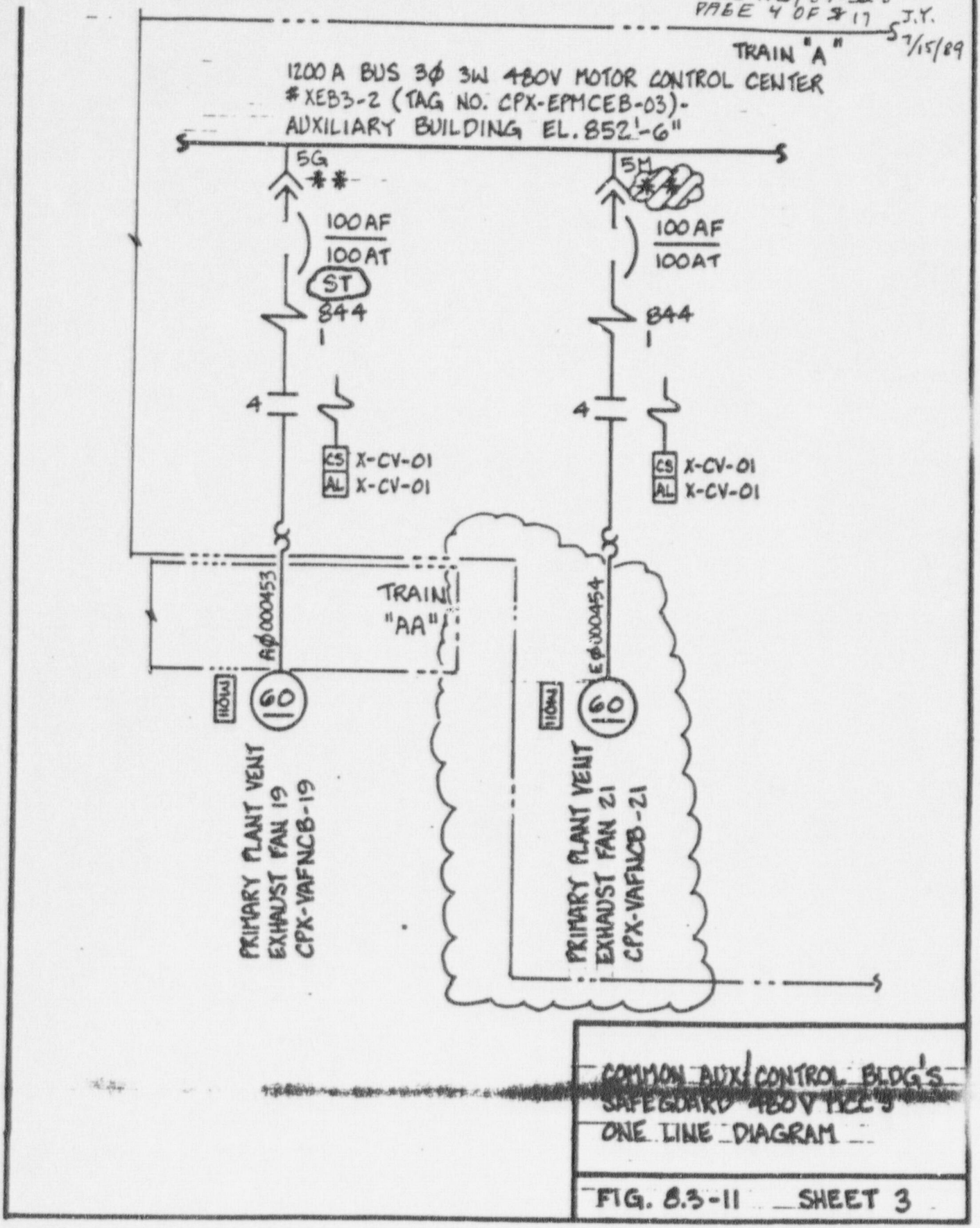

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 3

PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

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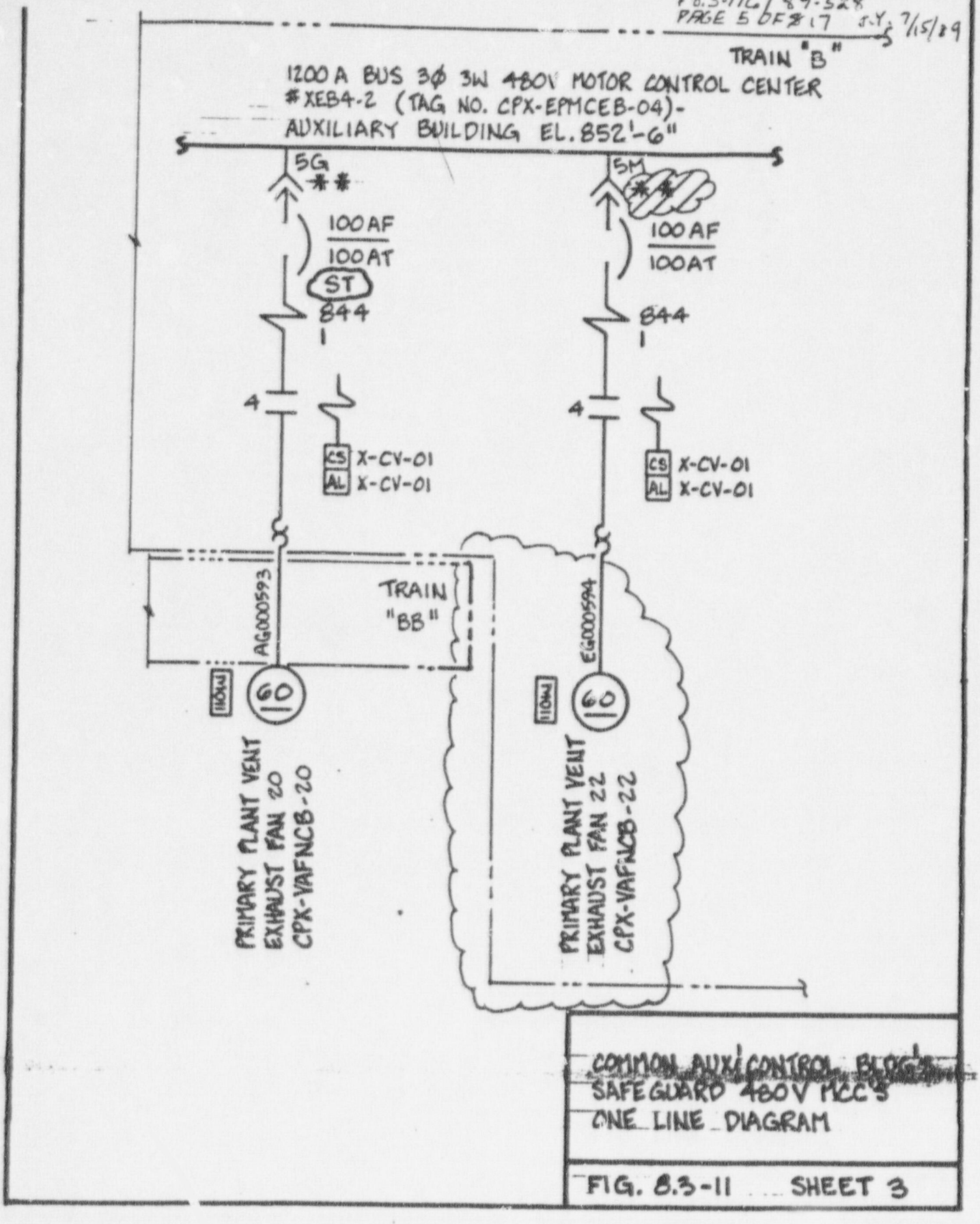

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 3

PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

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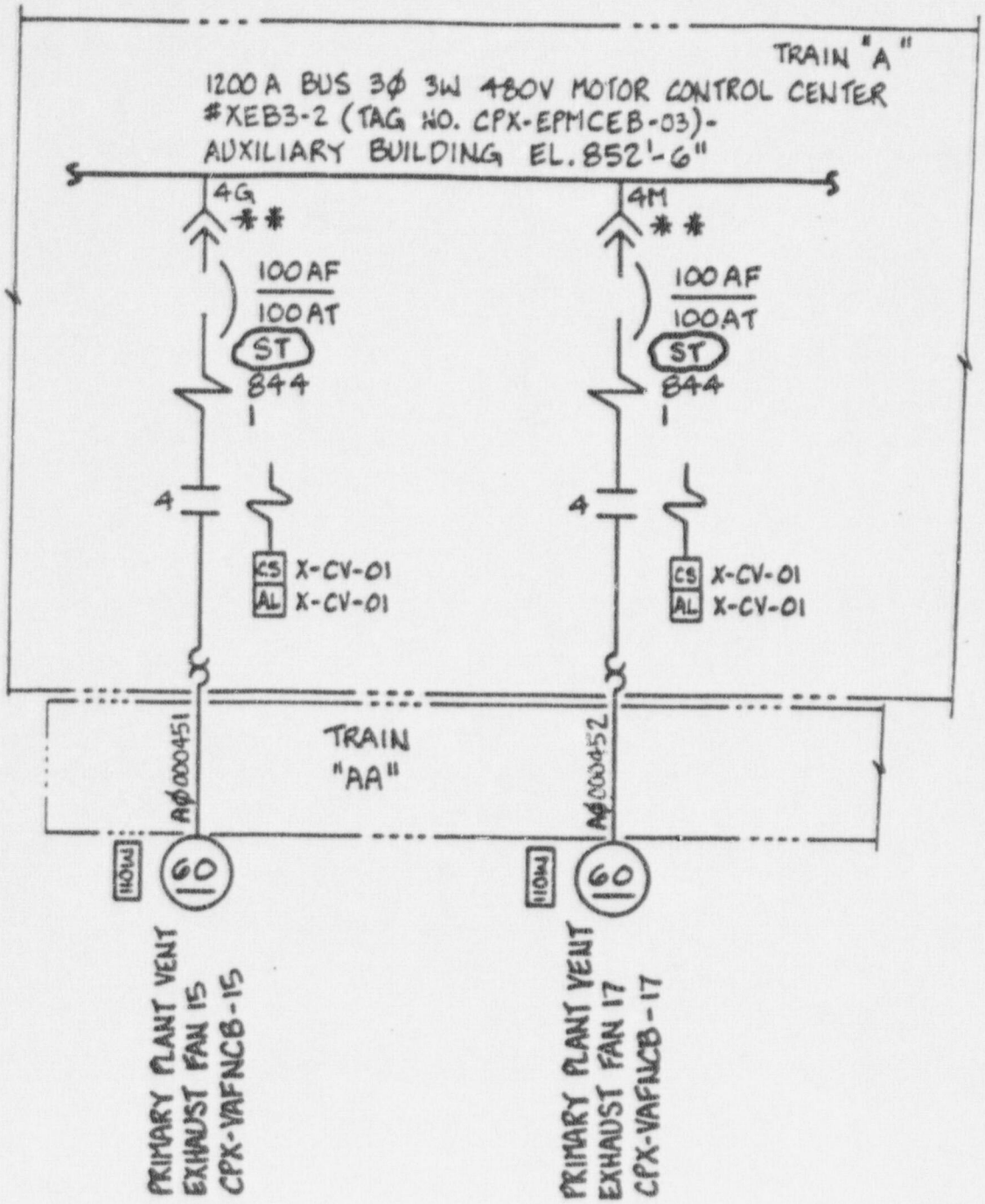

COMMON AUX/CONTROL BLDG'S
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 3

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PEAK STEAM ELECTRIC STATION
CONTINUATION SHEET

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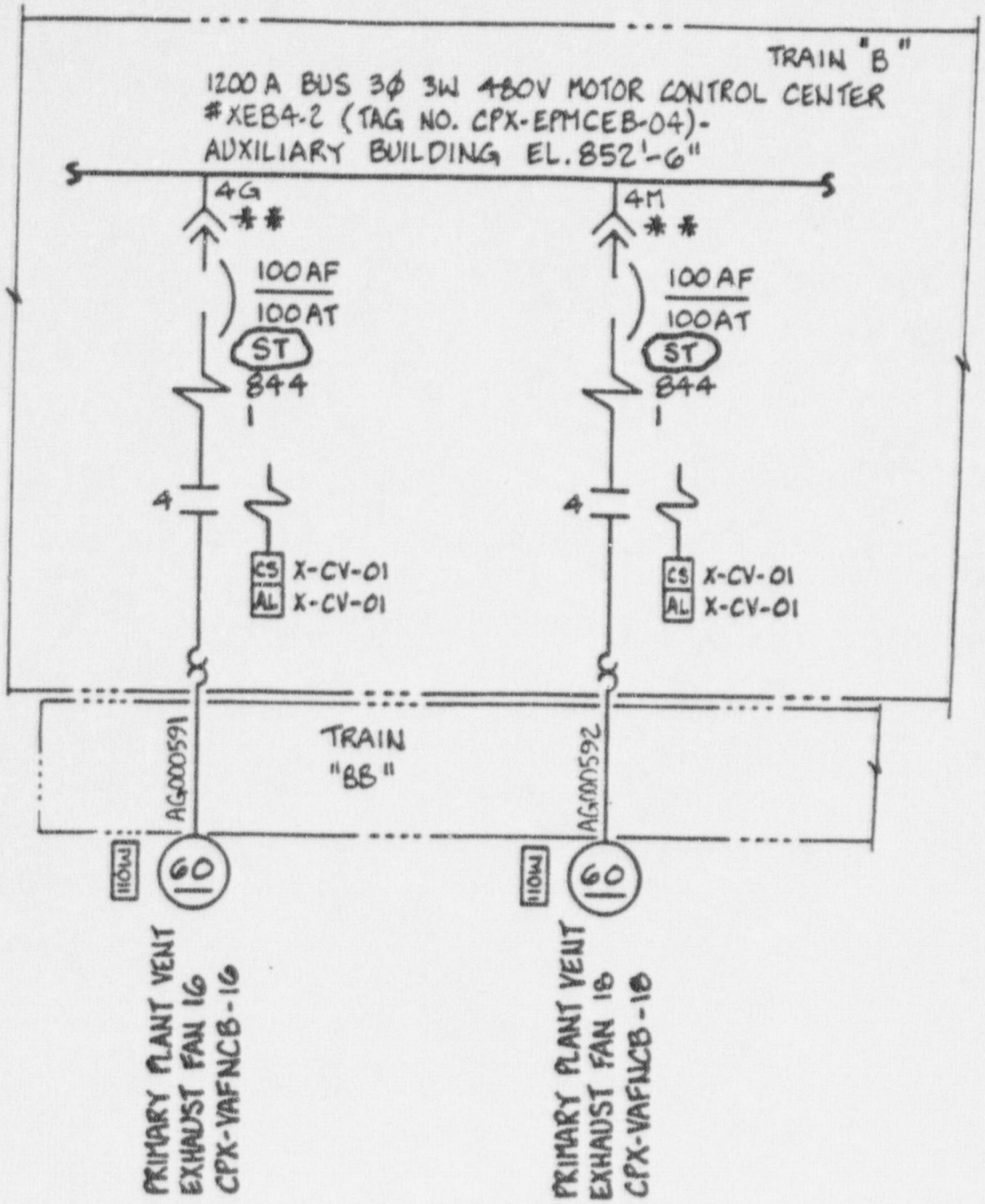

COMMON AUX & CONTROL BLDG'S.
SAFEGUARD 480V MCC'S
ONE LINE DIAGRAM

FIG. 8.3-11 SHEET 3

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PAGE 17 OF 19

FSAR Page (as amended)	Group	Description
Table 8.3-2	2	See Sheet No(s):6, 9 Revises Table 8.3-2 to reflect the addition of two Class 1E Primary Plant Ventilation Exhaust Fans and two Primary Plant ESF Heaters. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two installed PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. The PPV System has also been modified by adding two Primary Plant ESF Heaters, Class 1E power cables, and circuit breakers. The purpose of this modification is to provide additional heater capacity to ensure a maximum of 70% Relative Humidity within the ESF Air Filtration Units. FSAR Change Request Number: 89-528.13 Related SER Section: 8.3.1 SER/SSER Impact: No
Table 8.3-11	3	See Sheet No(s):6, 7 Deletes Primary Plant Vent Exhaust Fans 21 & 22 from Table 8.3-11, "NONSAFETY RELATED EQUIPMENT CONNECTED TO SAFETY RELATED POWER CIRCUITS". Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source

FSAR Page (as amended)	Group	Description
		consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of this modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.14 Related SER Section: 8.3.1 SER/SSER Impact: No
Table 8.3-1A	2	See Sheet No(s):4, 7 Revises Table 8.3-1A to reflect the addition of two Class 1E Primary Plant Ventilation Exhaust Fans and two Primary Plant ESF Heaters. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. The PPV System has also been modified by adding two Primary Plant ESF Heaters, Class 1E power cables, and circuit breakers. The purpose of this modification is to provide additional heater capacity to ensure a maximum of 70% Relative Humidity within the ESF Air Filtration Units. FSAR Change Request Number: 89-528.11 Related SER Section: 8.3.1 SER/SSER Impact: No
Table 8.3-1B	2	See Sheet No(s):4, 7 Revises Table 8.3-1B to reflect the addition of two Class 1E Primary Plant Ventilation Exhaust Fans and two Primary Plant ESF Heaters. Revision:

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DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
		The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two installed PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. The PPV System has also been modified by adding two Primary Plant ESF Heaters, Class 1E power cables, and circuit breakers. The purpose of this modification is to provide additional heater capacity to ensure a maximum of 70% Relative Humidity within the ESF Air Filtration Units. FSAR Change Request Number: 89-528.12 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-9	2	See Sheet No(s):1 Adds Primary Plant ESF Heater (CPX-VAFUPK-15), Class 1E power cable, and circuit breaker to 480V MCC 1EB1-1, Compartment 5F. Revision: The Primary Plant Ventilation System has been modified by adding two Primary Plant ESF Heaters, Class 1E power cables, and circuit breakers. The purpose of this modification is to provide additional heater capacity to ensure a maximum of 70% Relative Humidity within the ESF Air Filtration Units. FSAR Change Request Number: 89-528.1 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-9	2	See Sheet No(s):3 Adds Primary Plant ESF Heater (CPX-VAFUPK-16), Class 1E power cable, and circuit breaker to 480V MCC 1EB2-1, Compartment 5M. Revision: The Primary Plant Ventilation System has been modified

FSAR Page (as amended)	Group	Description
		by adding two Primary Plant ESF Heaters, Class 1E power cables, and circuit breakers. The purpose of this modification is to provide additional heater capacity to ensure a maximum of 70% Relative Humidity within the ESF Air Filtration Units. FSAR Change Request Number: 89-528.2 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-9	3	See Sheet No(s):3 Adds "S" signal trip to the breaker associated with each Boron Injection Tank Room Supply Fan (CP1-VAFNCB-08, 09) in Compartment 7M and 1M of 480V MCC 1EB2-1, respectively. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of this modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.3 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-11	2	See Sheet No(s):1 Adds "S" signal trip to the breakers associated with each of the following Primary Plant Ventilation Exhaust Fans (CPX-VAFNCB-09, 11, & 13) in Compartments 4M, 5G, & 5M of 480V MCC XEB1-2, respectively. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally

FSAR Page (as amended)	Group	Description
		procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.4 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-11	2	See Sheet No(s):1 Adds "S" signal trip to the breakers associated with each of the following Primary Plant Ventilation Exhaust Fans (CPX-VAFNCB-10, 12, & 14) in Compartments 4M, 5G, & 5M of 480V MCC XEB2-2, respectively. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.5 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-11	2	See Sheet No(s):2 Adds "S" signal trip to the breaker for the Auxiliary Building Ventilation Equipment Room Exhaust Fan (CPX-VAFNAV-27) in Compartment 3M of 480V MCC XEB1-1. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to

FSAR Page (as amended)	Group	Description
		Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.6 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-11	2	See Sheet No(s):2 Adds "S" signal trip to the breaker for the Auxiliary Building Ventilation Equipment Room Exhaust Fan (CPX-VAFNAV-28) in Compartment 4M of 480V MCC XEB2-1. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide addtional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.7 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-11	2	See Sheet No(s):3 Upgrades two Primary Plant Ventilation Exhaust Fans (CPX-VAFNCB-21, 22) and their power cables to Class 1E

FSAR Page (as amended)	Group	Description
		in Compartment 5M of 480V MCC XEB3-2 and Compartment 5M of 480V MCC XEB4-2, respectively. Also, removes the "S" signal trip from each Exhaust Fan's circuitry. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA and LOOP. FSAR Change Request Number: 89-528.10 Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-11	2	See Sheet No(s):3 Adds "S" signal trip to the breakers associated with each of the following Primary Plant Ventilation Exhaust Fans (CPX-VAFNCB-15, 17 & 19) in Compartments 4G, 4M & 5G for 480V MCC XEB3-2, respectively. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.8

FSAR Page (as amended)	Group	Description
		Related SER Section: 8.3.1 SER/SSER Impact: No
Figure 8.3-11	2	See Sheet No(s):3 Adds "S" signal trip to the breakers associated with each of the following Primary Plant Ventilation Exhaust Fans (CPX-VAFNCB-16, 18 & 20) in Compartments 4G, 4M & 5G for 480V MCC XEB4-2, respectively. Revision: The Primary Plant Ventilation (PPV) System has been modified by upgrading two installed PPV Exhaust Fans to Class 1E, removing the "S" signal trip from the fans' circuitry, upgrading the fans' power cables to Class 1E, and adding shunt trip devices to certain non-Class 1E Exhaust/Supply Fan circuitry. The two upgraded PPV Exhaust Fans and their power cables were originally procured as Class 1E and the power cables are routed in Class 1E raceways. The addition of the shunt trip devices provides electrical isolation between the non-Class 1E PPV Exhaust Fans and the Class 1E power source consistent with Reg. Guide 1.75 and FSAR Section 8.3. The shunt trip devices will cause the fans to trip upon receipt of an "S" signal. The purpose of the modification is to provide additional margin relative to the negative pressure required to be achieved and maintained in the negative pressure envelope during a LOCA or LOOP. FSAR Change Request Number: 89-528.9 Related SER Section: 8.3.1 SER/SSER Impact: No

8.3 Onsite Emergency Power Systems

8.3.1 AC Power System

The ac onsite power system is a Class 1E system which serves as a standby to the offsite power system. The safety function of the ac onsite emergency power system (assuming the offsite power system is not functioning) is to provide sufficient capacity and capability to ensure that the structures, systems, and components important to safety perform as intended. The objectives of the staff review are to determine if the ac onsite emergency power system has the required redundancy, meets the single-failure criterion, is testable, and has the capacity, capability, and reliability to supply power to all required safety loads in accordance with the requirements of GDC 5, 17, and 18.

The onsite ac power system consists of various auxiliary electrical systems designed to provide electric power to Class 1E and non-Class 1E station loads. The standby ac power systems is an independent, onsite system designed to automatically start and provide adequate power for Class 1E loads to ensure safe plant shutdown when preferred and alternate power sources are not available.

The Class 1E portion of the onsite power system is comprised of two redundant and independent 6.9-kV distribution systems with their 480-V load centers and motor control centers, 118-V ac power system, 125-V dc system, and the standby power supplies (diesel generator units).

Onsite emergency power for each unit is supplied by two diesel generators. Each diesel generator is automatically started by either a safety injection actuation signal or an emergency bus undervoltage signal on its respective emergency bus. Each diesel generator is capable of attaining rated voltage and frequency within 10 sec after receiving a starting signal. After obtaining rated voltage and frequency, the generators are connected automatically to their respective emergency buses. Under accident conditions, the safety loads will be connected in a predetermined sequence to their respective diesel generator. There is one diesel generator per bus. Each diesel generator and its associated equipment is located in a separate seismic Category I structure and is rated at 7000 kW for continuous operation, and has a 2-hr rating of 7700 kW. The continuous rating exceeds the maximum predicted operating loads. The applicant has documented that tests will be performed to demonstrate that during the loading sequence, the frequency and voltage are maintained above a level which would degrade the performance of any load below minimum requirements. The design and continuous rating are consistent with Regulatory Guide 1.9 and IEEE 387-1977 and, therefore, are acceptable.

Branch Technical Position ICSB 2 (PSB) (in Appendix 8A of the Standard Review Plan) requires that new and previously untried diesel generator designs to be used in nuclear power plant service undergo a prototype reliability verification testing program. The staff review indicates that the diesel generators have successfully passed a prototype reliability verification program of 300 valid start and load tests with no more than three allowed failures. This is in conformance with the staff position and is acceptable.

During the periodic testing of a diesel generator, if a safety-injection actuation signal occurs, the generator breaker will be tripped automatically by an "S" signal. This permits the unit to be cleared from parallel operation with the system and enables the diesel generator to attain the emergency standby mode. In this mode of operation, the diesel governor control changes automatically to the isochronous mode which maintains the engine running at a synchronous speed corresponding to 60 Hz at the generator terminals. All noncritical protective trips except engine overspeed and generator differential are bypassed. Simultaneously, the voltage regulator changes to the automatic mode maintaining the generator at a preset constant voltage of 6.9 kV. The diesel generator unit is now ready to accept load in the event of a loss-of-voltage signal (LOVS). If, during periodic testing of a diesel generator, an LOVS should occur, the diesel generator breaker is tripped on overcurrent creating an LOVS on the bus. The offsite power feed breaker is tripped and the diesel generator remains running, shifting the governor automatically from droop to isochronous mode and the voltage regulator to automatic mode. The diesel generator breaker is closed, connecting the diesel generator to the bus.

Branch Technical Position ICSB 17 (PSB) (in Appendix 8A of the Standard Review Plan) requires that diesel generator protective trips be bypassed when the diesel generator is required for a design-basis event. All protective trips are allowed during periodic testing. The allowed exceptions to the above requirement for bypassing are diesel engine overspeed and generator differential current. Any other trips retained must utilize coincident logic in order to avoid spurious trips. In case of a design-basis accident, the applicant is bypassing all the protective trips except engine overspeed and generator differential. This is in full conformance with the staff position and is acceptable.

Diesel generator instrumentation and alarm annunciators are located on the diesel room control panel. One "diesel trouble" signal is sent to the control room when any local alarm is received on the local diesel generator panel. A separate signal is sent to the safety system inoperable indication (SSII) panel whenever the diesel generator is not ready for automatic starting. The diesel generator starting mode selector switch has "remote/local/maintenance" positions and is normally in the "remote" mode of operation position. The only time it is in the "local" position is for local manual starting in the event of control room evacuation and nonroutine testing. If the switch is not returned to the "remote" position from the "local" or "maintenance" position, an alarm in the control room persists until the switch is returned to the "remote" mode. Other manual controls of the auxiliary system of the diesel generator are also alarmed at the SSII panel if failure to return to their auto start position would inhibit automatic operation of the diesel generators. In response to staff questions, the applicant has presented a list of conditions that would render the diesel generator units incapable of responding to an automatic emergency start signal. The staff has reviewed this information and concludes that each condition that renders a diesel generator unit incapable of responding to an automatic emergency start signal is alarmed in the control room. The alarm system display of "bypassed and inoperable status" of the diesel generators fulfills the requirements of Regulatory Guide 1.47 and is acceptable.

The 118-V ac single-phase, 60-Hz, grounded uninterruptible power is supplied to critical instrumentation and control circuits. There are two static uninterruptible power supplies (SUPS) for balance-of-plant instrumentation and control systems, four uninterruptible power supplies (UPS) for the reactor protection system and one UPS for the plant computer. Each SUPS consists of an inverter, ac input rectifier, bypass transformer, and static (automatic) and bypass (manual) switches. Each Class 1E inverter receives incoming normal power from a Class 1E 480-V motor control center and backup dc power from the Class 1E 125-V battery by means of an auctioneering-type circuit. If the ac power source fails, the inverter output will be maintained without interruption by the dc power from the battery.

In the absence of inverter output, the static switch disconnects the inverter from the load and connects the load to the alternate supply line from the bypass (nonregulating) transformer within 1/4 cycle.

Each bypass transformer receives incoming power supply from a Class 1E 480-V MCC. The inverter will automatically resynchronize with the bypass source following restoration of this reference source. A manual bypass transfer switch, provided for equipment maintenance, can be used to bypass the static switch and supply power to the load directly from the inverter or bypass transformer. Operation of the bypass switch to any position will not cause power interruption to the load. Bypassing of the static switch or inverter is annunciated locally and in the control room.

The ac instrument buses have two incoming circuit breakers to power the loads from either the SUPS or directly from the bypass transformers. These manually operated circuit breakers are mechanically interlocked to prevent paralleling of sources.

Based upon its review, the staff has determined that the four uninterruptible power supplies for the reactor protection systems are independent.

Nuclear-safety-related loads common to both units are powered from Class 1E MCCs and distribution panels which have supplies from each unit. These dual unit supplies are interlocked to preclude supplying power to one MCC or distribution panel from both units simultaneously. Incoming feeders to train A MCCs or distribution panels common to both units are supplied only from train A power systems of both units (a similar arrangement exists for train B equipment and incoming feeders). This ensures the proper train separation between equipment common to both units.

The applicant has applied the following design criteria to the Class 1E equipment.

(1) All safety-related continuous-duty Class 1E motors are sized with a nameplate service factor of 1.15, except for some totally enclosed Class 1E motors that are sized for 115% of full load and have a 1.0 service factor.

(2) All safety-related Class 1E motors are designed to accelerate their driven loads with 80% of the motor-rated voltage available at the terminals.

(3) Transformer impedances are selected to permit starting of the largest motor on the bus without exceeding a maximum voltage drop of 20% and at the same time remaining within the interrupting and momentary capabilities of the breakers.

(4) System grounding and equipment grounding are provided to reduce the electrical hazard to plant personnel.

The 6.9-kV system is low-resistance grounded and is designed to trip on ground faults to protect the 6.9-kV equipment. The diesel generator units are high-resistance grounded to allow the generator to continue to supply power without tripping on a single ground fault condition. The 480-V system is high-resistance grounded with a ground detection scheme. A ground fault condition on the 480-V system or in the diesel generator system is annunciated in the control room.

The above criteria are in conformance with Section 8.1 of this report and are acceptable.

As a result of its review of the emergency onsite ac power system, the staff has determined that there are no automatic transfers of loads or sources between redundant emergency buses, which is in accordance with Regulatory Guide 1.6. There is no sharing of emergency power sources between units, which is in accordance with Regulatory Guide 1.81. The two divisions of the emergency power and distribution system are independent, meet the single-failure criterion, and have the capability and capacity as required by GDC 17. The design is in conformance with IEEE Standard 308-1974, as endorsed by Regulatory Guide 1.32. The electric power systems are designed to permit inspection and testing of all Class 1E systems. Periodic testing is performed on a scheduled basis to demonstrate the operability and continuity of all safety-related systems and components, in accordance with GDC 18. Therefore, the staff finds the emergency onsite ac power system acceptable.

8.3.2 DC Power Systems

The station dc systems supply power to the plant instrumentation and control under all modes of plant operation. In addition, upon loss of ac power, the dc systems provide power for emergency lighting and turbine-generator auxiliary motors.

The dc systems for each unit consist of one 125/250-V and one 24/48-V non-Class 1E battery systems and two independent and redundant Class 1E 125-V battery systems.

The Class 1E 125-V battery systems supply power to Class 1E loads without interruption during normal operations or DBA conditions. Each Class 1E 125-V dc system consists of one battery, one main distribution bus with molded-case circuit breakers, two static battery chargers (one spare), and local distribution panels. Redundancy and independence of components precludes the loss of both systems as a result of a single failure. For Unit 1, battery BT1ED2 supplies train B load requirements. There are no bus ties or sharing of power

8.3.1 AC Power System

30. FSAR is revised to show upgrade to Class 1E of two Primary Plant Ventilation Exhaust Fans and the addition of two Primary Plant ESF Heaters in the Primary Plant Ventilation System to maintain negative pressure (incorporates commitments of TXX-89133 of 3/10/89).

CPSES/FSAR

TABLE 8.3-11

(Sheet 6)

NONSAFETY RELATED EQUIPMENT CONNECTED
TO SAFETY RELATED POWER CIRCUITS

EQUIPMENT ID NO.	DESCRIPTION	POWER SOURCE ID NO.		NOTE	
CPX-VAFNCB-04	CONTAINMENT HYDROGEN PURGE SUPPLY FAN 04	CPX-EPMCEB-02	3E	(1)	68
CPX-EPTRET-02	AUX BLDG ISOLATION TRANSFORMER TXEC2	CPX-EPMCEB-02	5BL	(5)	68
CPX-CHAPCP-01	VENT CHILLED WATER PUMP 1	CPX-EPMCEB-07	4M	(1)	68
CPX-VAFNAV-27	AUXILIARY BLDG VENT EQUIP ROOM EXHAUST FAN 27	CPX-EPMCEB-07	3M	(1)	68
					75
CPX-EPTRET-03	ISOLATION TRANSFORMER TXEC3	CPX-EPMCEB-07	1C	(5)	68
CPX-EPTRET-01	ISOLATION TRANSFORMER TXEC1	CPX-EPMCEB-07	1BR	(5)	68
CPX-CHAPCP-02	VENT CHILLED WATER PUMP 2	CPX-EPMCEB-08	3M	(1)	68
CPX-VAFNAV-28	AUXILIARY BLDG VENT EQUIP ROOM EXHAUST FAN 28	CPX-EPMCEB-08	4M	(1)	68
					75
X-RE-5568/75/67A	VENT STACK "1" RADIATION MONITOR SYS SAMPLE PUMP	CPX-EPMCEB-03	6C	(1)	68
CPX-VAFNCB-15	PRIMARY PLANT VENT EXHAUST FAN 15	CPX-EPMCEB-03	4G	(7)	76
CPX-VAFNCB-17	PRIMARY PLANT VENT EXHAUST FAN 17	CPX-EPMCEB-03	4M	(7)	76
CPX-VAFNCB-19	PRIMARY PLANT VENT EXHAUST FAN 19	CPX-EPMCEB-03	5G	(7)	76
CPX-VAFNCB-21	PRIMARY PLANT VENT EXHAUST FAN 21	CPX-EPMCEB-03	5M	(7)	76

CPSES/FSAR

TABLE 8.3-11

(Sheet 7)

NONSAFETY RELATED EQUIPMENT CONNECTED
TO SAFETY RELATED POWER CIRCUITS

EQUIPMENT ID NO.	DESCRIPTION	POWER SOURCE ID NO.		NOTE	
CPX-CHCICE-01	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-03	5BL	(1)	68
CPX-CHCICE-03	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-03	5BR	(1)	68
X-RE-5568/75/67B	VENT STACK "2" RADIATION MONITOR SYS SAMPLE PUMP	CPX-EPMCEB-04	6G	(1)	68
CPX-VAFNCB-16	PRIMARY PLANT VENT EXHAUST FAN 16	CPX-EPMCEB-04	4G	(7)	76
CPX-VAFNCB-18	PRIMARY PLANT VENT EXHAUST FAN 18	CPX-EPMCEB-04	4M	(7)	76
CPX-VAFNCB-20	PRIMARY PLANT VENT EXHAUST FAN 20	CPX-EPMCEB-04	5G	(7)	76
CPX-VAFNCB-22	PRIMARY PLANT VENT EXHAUST FAN 22	CPX-EPMCEB-04	5M	(7)	76
CPX-EPTRET-04	ISOLATION TRANSFORMER TXEC4	CPX-EPMCEB-04	7C	(5)	68
CPX-CHCICE-02	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-04	5BL	(1)	68
CPX-CHCICE-04	HVAC CENTRIFUGAL WATER CHILLER OIL PUMP	CPX-EPMCEB-04	5BR	(1)	76
CP1-MEDGEE-01M	PRELUBE PUMP	CP1-EPMCEB-09	6M	(1)	68
CP1-MEDGEE-01L	JACKET WATER KEEP WARM PUMP	CP1-EPMCEB-09	7J	(1)	68
CP1-MEDGEE-01N	FUEL OIL BOOSTER PUMP	CP1-EPMCEB-09	7M	(1)	68
CP1-MEDGEE-01G	FUEL OIL DRIP RETURN PUMP	CP1-EPMCEB-09	8M	(1)	68
CP1-MECAED-01	COMPRESSOR AFTERCOOLER 1	CP1-EPMCEB-09	7C	(1)	68