

- NOTES:**
- DELETED.
  - AUTOMATIC TRANSFER WILL BE INITIATED IMMEDIATELY FOLLOWING GENERATION SYSTEM FAILURES AND TURBINE TRIPS RESULTING FROM VIBRATION, LOW VACUUM AND THRUST BEARING WEAR. ALL OTHER TURBINE TRIPS WILL BE DELAYED 30 SECONDS BEFORE TRANSFER.
  - THIS CIRCUIT BREAKER SUPPLIES ESSENTIAL SERVICE WATER LOADS.
  - DELETED.
  - EACH SINGLE PHASE TRANSFORMER WILL BE RATED 345KV, 533.3MVA. IMPEDANCE ON TRANSFORMER MVA BASE IS 9.10%.
  - SEE DRAWING E-U1001.
  - DELTA CONNECTED STABILIZING WINDING WILL NOT BE INCLUDED ON UNION ELECTRIC TRANSFORMER, PRIMARY WINDING WILL BE RATED 345KV.
  - THIS BREAKER IS TRIPPED BY THE LOAD SHEDDER/SEQUENCER FOLLOWING AN SIS OR ESSENTIAL BUS UNDERVOLTAGE SIGNAL.
  - TRY SURGE CAPACITORS MA05A, MA05B, MR02A AND MR02B SHALL BE RATED 13.8KV 750M PER PHASE.
  - RETRANSFER TIME SETTING AT 2 MINUTES.
  - DELETED.
  - ALTERNATE EMERGENCY POWER SYSTEM (AEPS)-COOP WITH D/G BACKUP. SEE DRAWING 8600-X-9098B.
  - ALTERNATE FLEX D/G CONNECTION. SEE DRAWING E-23PG17.

13.8KV	H.P.	BREAKER NO.	4.16KV	H.P.	BREAKER NO.	4.16KV	H.P.	BREAKER NO.
<b>BUS PA01</b>			<b>CLASS 1E BUS NB01</b>			<b>BUS PB03</b>		
REACTOR COOLANT PUMP DPBB01A	7000	252PA0107	RESIDUAL HEAT REMOVAL PUMP DPEJ01A	500	152NB0101	HEATER DRAIN PUMP DPAF01A	1500	152PB0303
REACTOR COOLANT PUMP DPBB01B	7000	252PA0108	SAFETY INJECTION PUMP DPDM01A	450	152NB0103	CONDENSATE PUMP DPAD01A	3500	152PB0304
<b>BUS PA02</b>			CENTRIFUGAL CHARGING PUMP DPBG05A	600	152NB0104	CONDENSATE PUMP DPAD01C	3500	152PB0305
REACTOR COOLANT PUMP DPBB01C	7000	252PA0205	COMPONENT COOLING WATER PUMP DPEG01A	700	152NB0107	CENTRAL CHILLER COMPRESSOR DSCB01A	927	152PB0302
REACTOR COOLANT PUMP DPBB01D	7000	252PA0204	COMPONENT COOLING WATER PUMP DPEG01C	700	152NB0108	NORMAL CHARGING PUMP DPBG04	600	152PB0301
			CONTAINMENT SPRAY PUMP DPEN01A	500	152NB0102			
			AUXILIARY FEEDWATER PUMP DPAL01A	800	152NB0105			
			ESSENTIAL SERVICE WATER PUMP DPEF01A	1750	152NB0115			
			<b>CLASS 1E BUS NB02</b>			<b>BUS PB04</b>		
			RESIDUAL HEAT REMOVAL PUMP DPEJ01B	500	152NB0204	CONDENSATE PUMP DPAD01B	3500	152PB0403
			SAFETY INJECTION PUMP DPDM01B	450	152NB0202	HEATER DRAIN PUMP DPAF01B	1500	152PB0404
			CENTRIFUGAL CHARGING PUMP DPBG05B	600	152NB0201	CENTRAL CHILLER COMPRESSOR DSCB01B	927	152PB0405
			COMPONENT COOLING WATER PUMP DPEG01B	700	152NB0206	MOTOR DRIVEN FEEDWATER PUMP DPAE02	300	152PB0406
			COMPONENT COOLING WATER PUMP DPEG01D	700	152NB0207			
			CONTAINMENT SPRAY PUMP DPEN01B	500	152NB0203			
			AUXILIARY FEEDWATER PUMP DPAL01B	800	152NB0205			
			ESSENTIAL SERVICE WATER PUMP DPEF01B	1750	152NB0215			

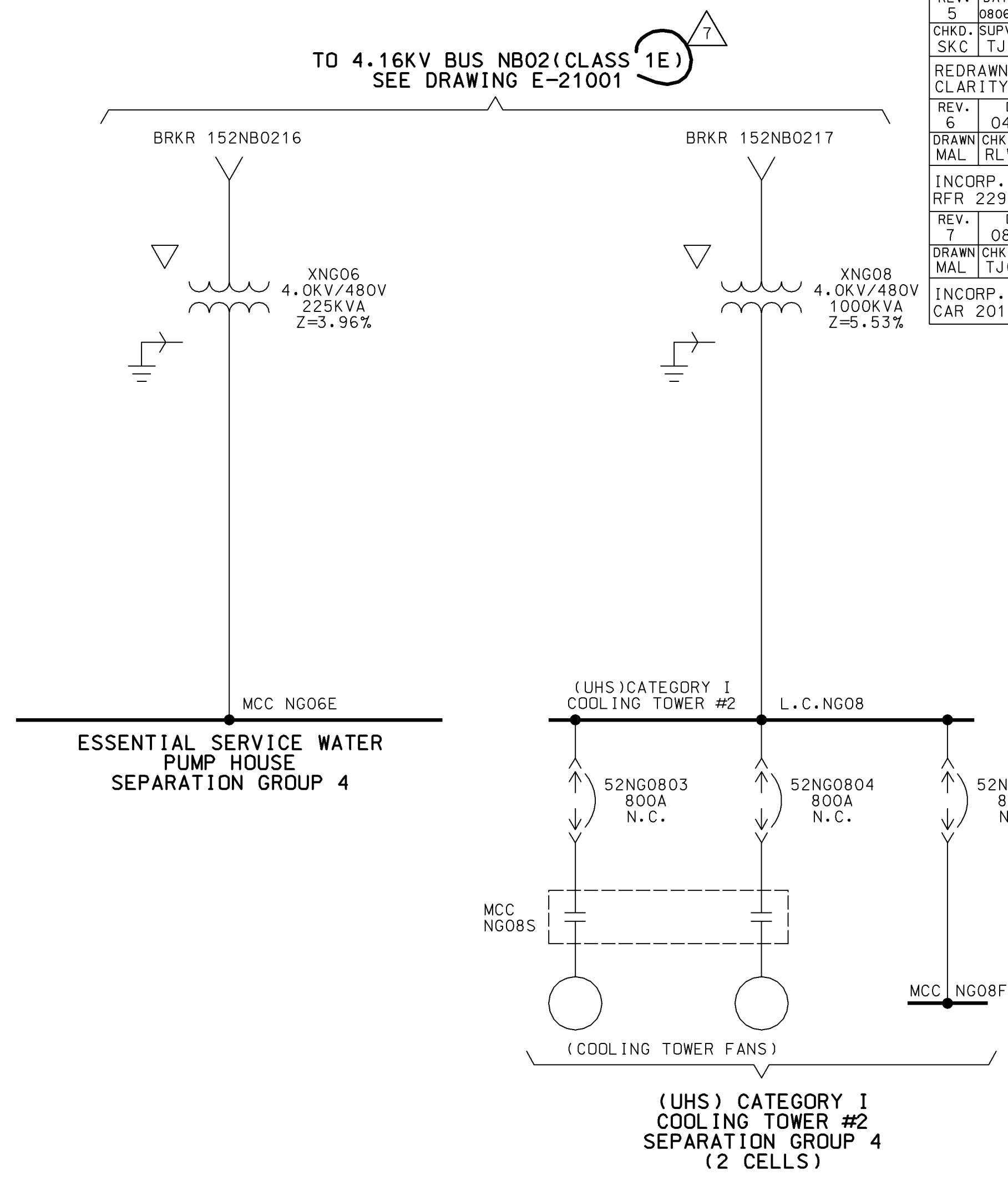
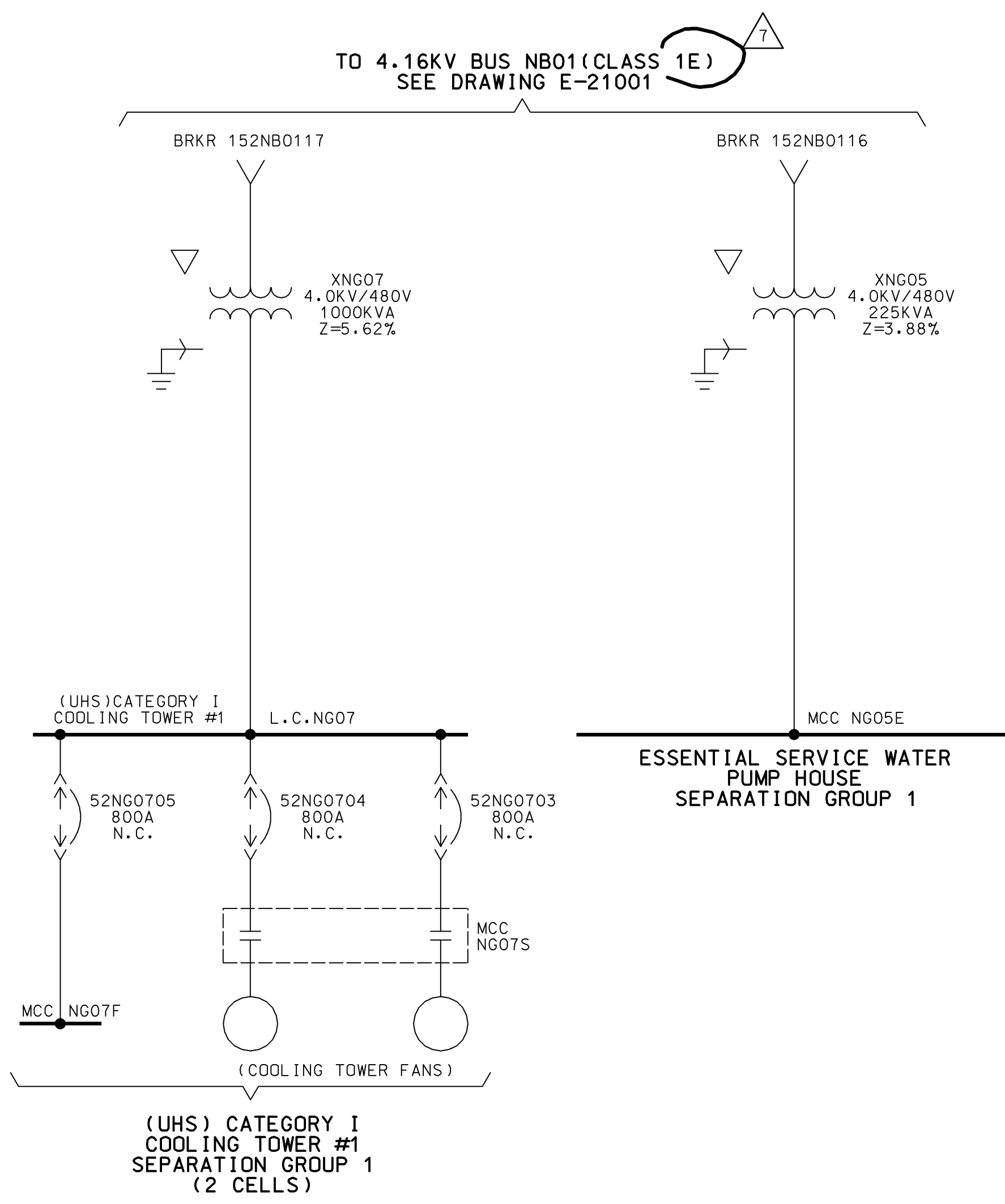
**AS-BUILT CLASS 1**

DRWN	N/A	(DATE)	
CHKD	N/A	(DATE)	
SUPV	N/A	(DATE)	
APPD	N/A	(DATE)	
LOCATION	CALLAWAY ENERGY CENTER	CLASS	
UNION ELECTRIC COMPANY	ST. LOUIS, MO	E-21001(Q)	REV. 25

**MAIN SINGLE LINE DIAGRAM**

FSAR FIGURE 8.3-1 SHEET 1

REV. 5	DATE 080693	DRAWN HLP
CHKD. SKC	SUPV. TJM	APPD. N/A
REDRAWN FOR CLARITY.		
REV. 6	DATE 041905	
DRAWN MAL	CHKD. RLW	SUPV. TWS
INCORP. RFR 22941A		
REV. 7	DATE 080311	
DRAWN MAL	CHKD. TJC	SUPV. TWS
INCORP. CAR 201101335.		



**NOTES:**

1. THE EQUIPMENT SHOWN IS FOR ONE UNIT.

**AS-BUILT CLASS 1**

DRAWN (DATE)		<b>SINGLE LINE DIAGRAM ESSENTIAL SERVICE WATER SYSTEM</b> FSAR FIGURE 8.3-1 SHEET 2		CLASS	
N/A				CALLAWAY ENERGY CENTER	
CHKD. (DATE)				UNION ELECTRIC COMPANY	
N/A				ST. LOUIS, MO	
APPD. (DATE)				E-U1001(Q)	
N/A		REV. 7			

FIGURE 8.3-1 (SHEET 3)  
DELETED

FIGURE 8.3-1 (SHEET 4)  
DELETED

SAFETY RELATED LOAD GROUP 1

Table with columns: DESCRIPTION, EQUIPMENT NUMBER, LOAD SHED SIGNAL (NOTE 9), VOLTAGE, BUS # & LOAD GRP., LOAD NAME - PLATE RATING, LOCA TIME TO START (SEC) SEE NOTE 1, LOOP TIME TO START (SEC) SEE NOTE 1. Includes rows for COMPONENT COOLING WATER PP #1, CONTAINMENT SPRAY PP #1, RESIDUAL HEAT REMOVAL PP #1, etc.

SAFETY RELATED LOAD GROUP 2

Table with columns: DESCRIPTION, EQUIPMENT NUMBER, LOAD SHED SIGNAL (NOTE 9), VOLTAGE, BUS # & LOAD GRP., LOAD NAME - PLATE RATING, LOCA TIME TO START (SEC) SEE NOTE 1, LOOP TIME TO START (SEC) SEE NOTE 1. Includes rows for COMPONENT COOLING WATER PP #2, CONTAINMENT SPRAY PP #2, RESIDUAL HEAT REMOVAL PP #2, etc.

NOTES:

- 1. THE SAFETY ANALYSIS ASSUMES A 12 SEC. START TIME FOR THE DIESEL TO COME UP TO SPEED AND VOLTAGE AFTER DG START SIGNAL. HOWEVER THE START TIMES SHOWN ARE BASED ON STEP 0 FOR THE LOADS.
2. STARTS AND/OR STOPS AUTOMATICALLY BY A SIGNAL FROM PRESSURE OR TEMPERATURE SWITCH, OR MANUALLY OPERATED WHEN REQUIRED.
3. DELETED
4. DELETED
5. DELETED
6. SEQUENCER STARTS ONE OF THE TWO COMPONENT COOLING WATER PUMPS IN EACH LOAD GROUP AND 5 SECONDS LATER STARTS THE 2ND (STANDBY) PUMP IN THE SAME LOAD GROUP PROVIDED THE FIRST PUMP FAILED TO START SIMILAR SEQUENCE OF OPERATION IS PROVIDED FOR ESSENTIAL SERVICE WATER PUMPS.
7. DELETED
8. DELETED
9. "UV" SIGNALS SHED BOTH SAFETY AND NON-SAFETY RELATED LOADS UPON LOSS OF VOLTAGE ON D-G BUSES. THE "S" SIGNAL ORIGINATES WITHIN THE LOAD SHEDDER/SEQUENCER PANEL. THIS SIGNAL IS A DERIVATIVE OF THE SAFETY INJECTION SIGNAL (SIS) AND SERVES TO TRIP THOSE NON I-E LOADS CONNECTED TO THE CLASS I-E BUSES ON THE OCCURRENCE OF AN SIS.
10. DELETED.
11. STARTING OF A PUMP ROOM COOLER WILL BE INTERLOCKED WITH ITS RESPECTIVE PUMP MOTOR BREAKER.
12. DELETED
13. UNDER CERTAIN CIRCUMSTANCES THIS LOAD MAY BE CONNECTED TO THE BUS AND SINCE IT IS NOT SHED, THIS LOAD MUST BE CONSIDERED AS STARTING AT 0 SEC.
14. AUXILIARY BUILDING PUMP ROOM COOLERS ARE AS FOLLOWS: PUMP SERVED EQUIPMENT NO. GROUP 1/GROUP 2 TIME TO START SEE NOTE 11
CENT. CHARGING DSGL12A/DSGL12B
SAFETY INJECTION DSGL09A/DSGL09B
COMP. COOLING WTR DSGL11A/DSGL11B
R.H.R. DSGL10A/DSGL10B
CONTM SPRAY DSGL13A/DSGL13B
15. CONTAINMENT SPRAY PUMP STARTS AT 15 SEC. IF A CSAS IS PRESENT AT 15 SEC. OTHERWISE, CONTAINMENT SPRAY PUMP STARTS ANYTIME AFTER 41.5 SEC. WHEN A CSAS IS PRESENT.
16. E.S.W. PUMPHOUSE HEATERS ARE AS FOLLOWS: GRP.1 EQUIP. NO. GRP.2 EQUIP. NO.
EGD01A EGD01E EGD01G
EGD01B EGD01D EGD01F EGD01H
17. DELETED.
18. DELETED
19. DELETED
20. THIS START TIME INCLUDES A TIME DELAY RELAY DELAY TIME DRAWING E-23GM01, E-23GM01A.
21. SUGGESTED START TIMES WERE REMOVED PER CAR 200609539.
22. THE BUFFALO FORGE-WESTINGHOUSE AND RELIANCE MOTORS ARE NAMEPLATED AT 100 HP; THE PAT-BALDOR MOTOR IS NAMEPLATED AT 150 HP.

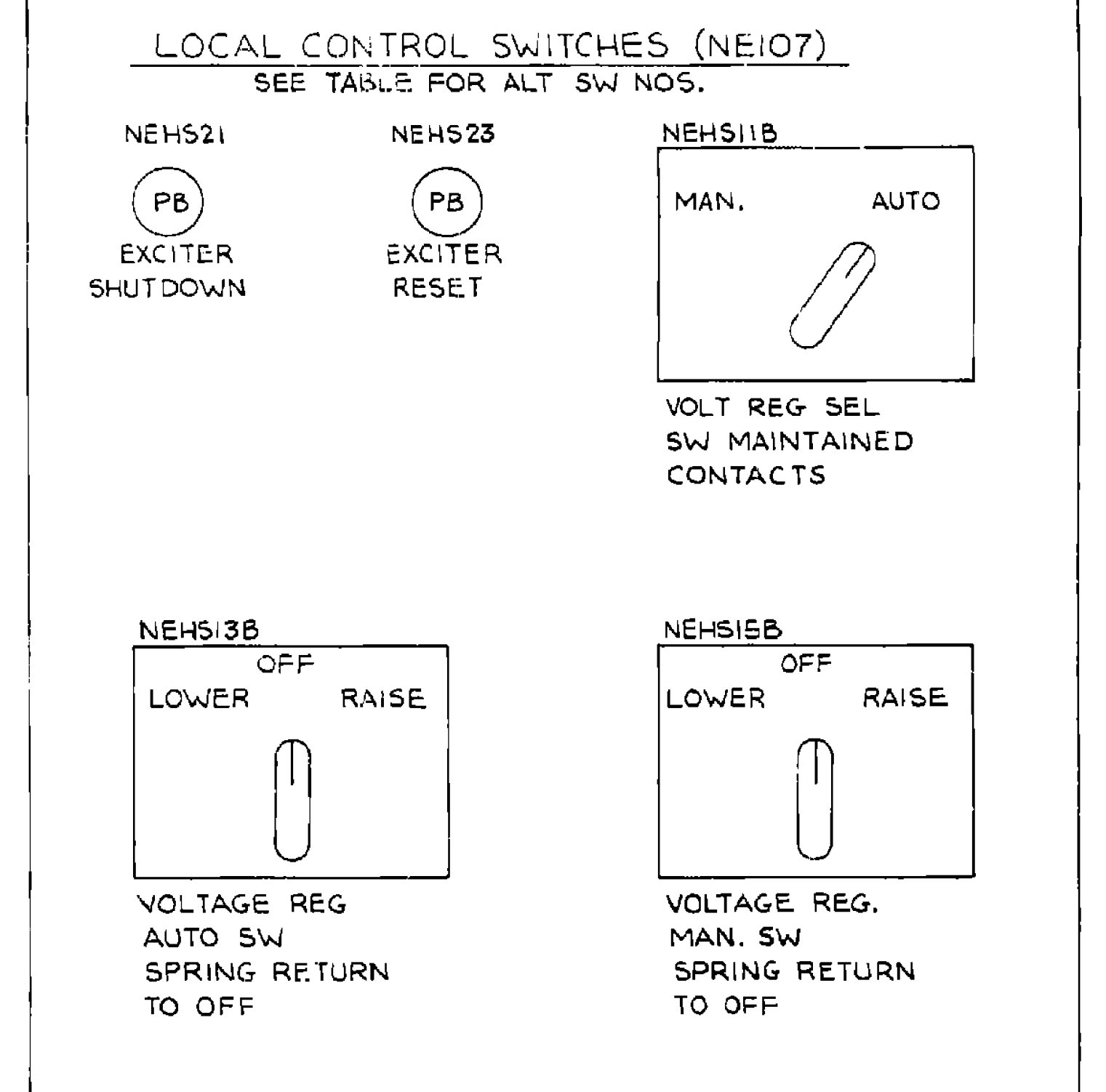
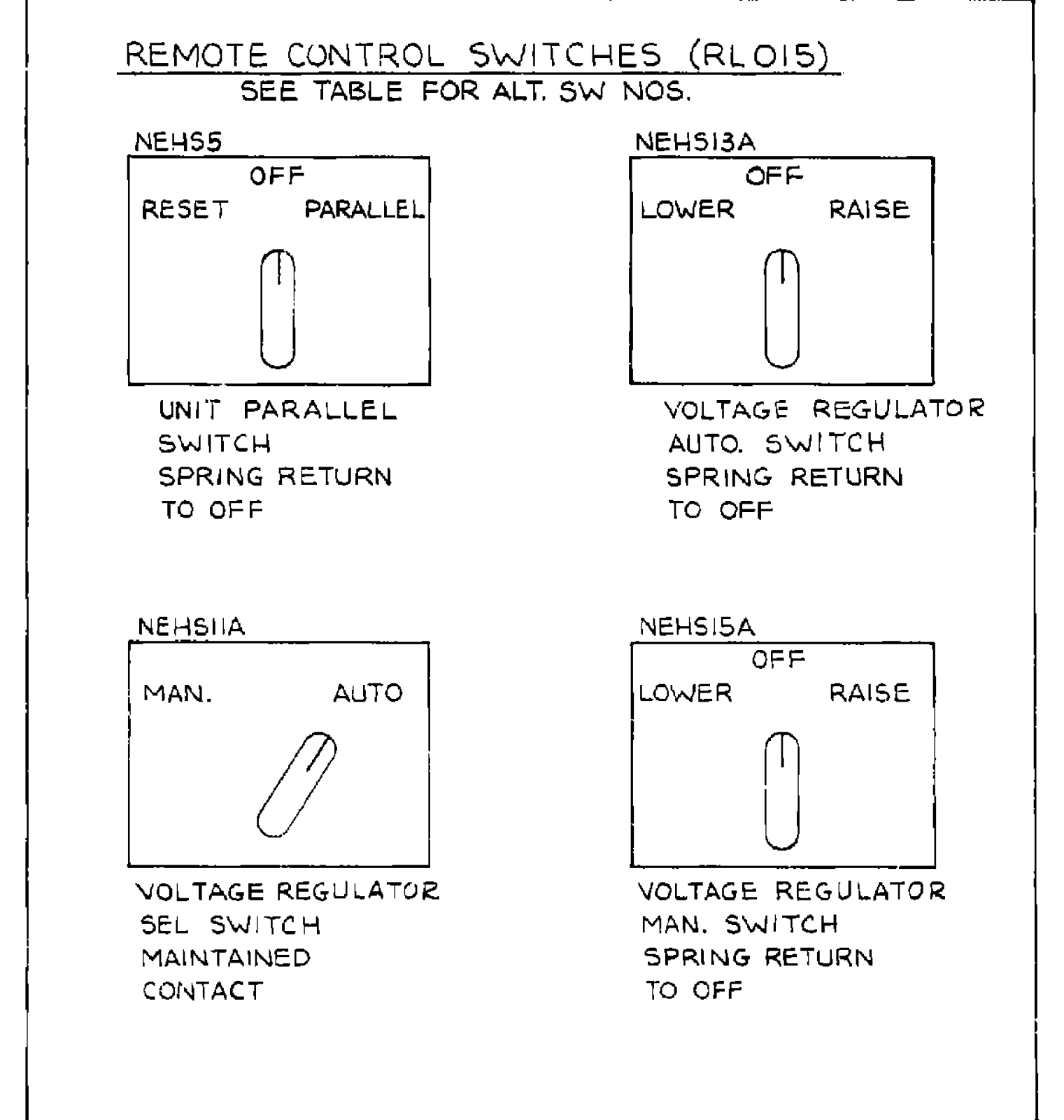
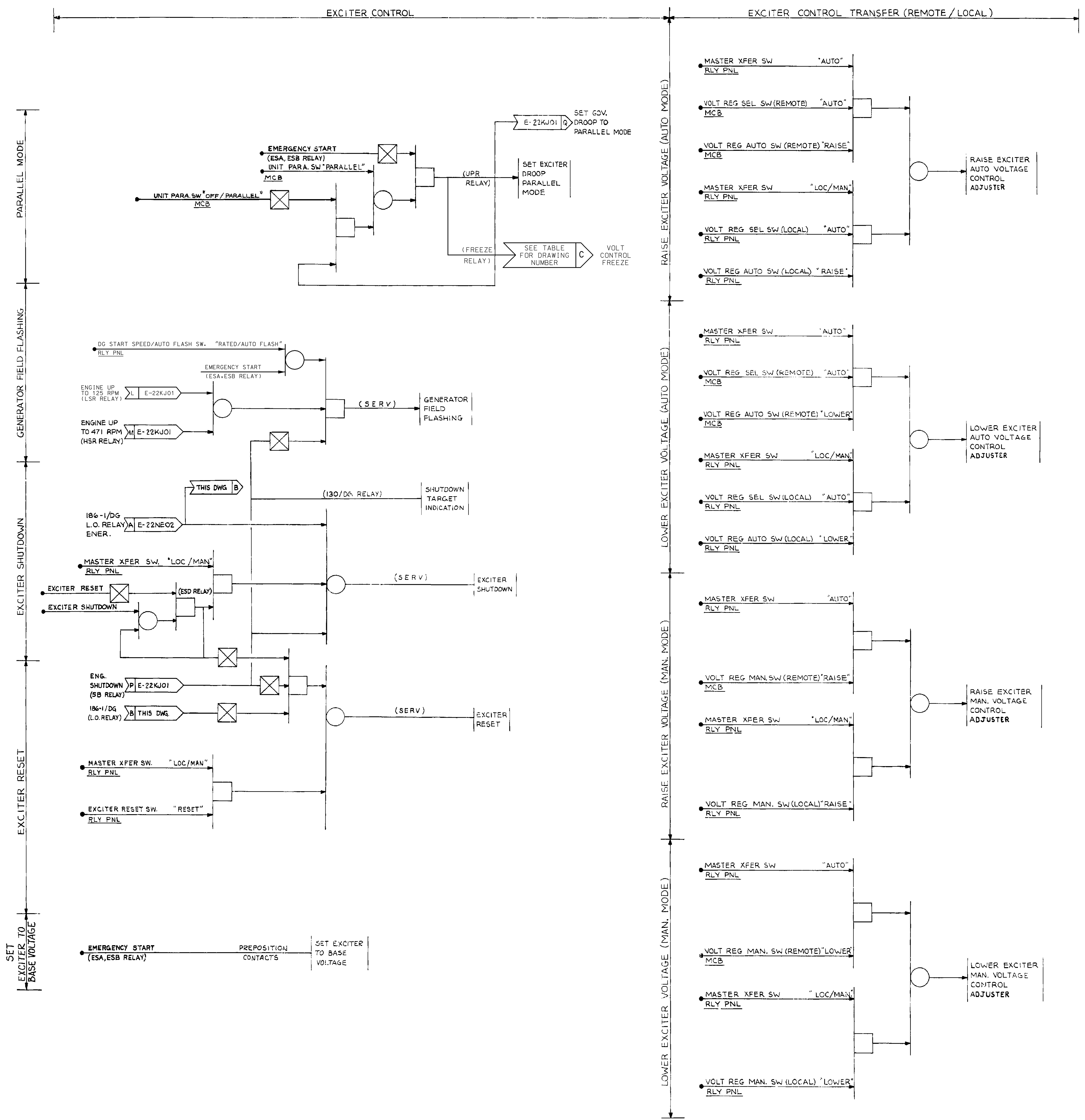
NON-SAFETY RELATED LOAD GROUP 1

Table with columns: DESCRIPTION, EQUIPMENT NUMBER, LOAD SHED SIGNAL (NOTE 9), VOLTAGE, BUS # & LOAD GRP., LOAD NAME - PLATE RATING, LOCA TIME TO START (SEC) SEE NOTE 1, LOOP TIME TO START (SEC) SEE NOTE 1. Includes rows for INSTRUMENT AIR COMPRESSOR #1, CRDM #4 COOLING FANS, BORIC ACID TRANSFER PP #1, PRESSURIZER HEATER BU GRP.1, INST. AC POWER 120 V. GRP.1, 125 V. BATTERY CHARGER PK21, BOP COMPUTER - GRP.1, P.P.HSE. (CLNG TOWER)STDBY AC LTG. GRP.1, LOAD CENTER LOSSES GRP.1, E.S.W. UNIT HTRS. GRP.1, U.H.S. SUMP HTR. GRP.1, U.H.S. CLNG.TWR.EQUIP.RM.SUMP PUMP, E.S.W. PUMPHOUSE HTRS. GRP.1, STANDBY A.C. LTG. GRP.1, POST ACCIDENT SAMPLING SYSTEM.

NON-SAFETY RELATED LOAD GROUP 2

Table with columns: DESCRIPTION, EQUIPMENT NUMBER, LOAD SHED SIGNAL (NOTE 9), VOLTAGE, BUS # & LOAD GRP., LOAD NAME - PLATE RATING, LOCA TIME TO START (SEC) SEE NOTE 1, LOOP TIME TO START (SEC) SEE NOTE 1. Includes rows for INSTRUMENT AIR COMPRESSOR #2, CRDM #2 COOLING FANS, BORIC ACID TRANSFER PP #2, PRESSURIZER HEATER BU GRP.2, INST. AC POWER 120 V. GRP.2, 125 V. BATTERY CHARGER PK22, BOP COMPUTER - GRP.2, BORIC ACID FILTER TO CHARGING PUMP VALVE, P.P.HSE. (CLNG TOWER)STDBY AC LTG. GRP.2, LOAD CENTER LOSSES GRP.2, E.S.W. UNIT HTRS. GRP.2, U.H.S. SUMP HTR. GRP.2, U.H.S. CLNG.TWR.EQUIP.RM.SUMP PUMP, E.S.W. PUMPHOUSE HTRS. GRP.2, STANDBY A.C. LTG. GRP.1, 250 V. BATTERY CHARGER PJ31, E.S.W. PUMPHOUSE MONORAIL HOIST.

AS-BUILT LIST OF LOADS SUPPLIED BY EMERGENCY DIESEL GENERATOR FSAR FIGURE 8.3-2 CALLAWAY ENERGY CENTER UNION ELECTRIC COMPANY ST. LOUIS, MO E-21005(Q) REV. 36



EQUIPMENT	NE01	NE02
MASTER TRANSFER SW (NOTE 1)	KJH59	KJH5109
DIESEL START/STOP SW (NOTE 1)	KJH58A	KJH5108A
UNIT PARALLEL SWITCH	NEH55	NEH56
EXCITER RESET SWITCH	NEH523	NEH524
EXCITER SHUTDOWN SW	NEH521	NEH522
VOLT REG SEL SW (REMOTE)	NEH511A	NEH512A
VOLT REG SEL SW (LOCAL)	NEH511B	NEH512B
VOLT REG AUTO SW (REMOTE)	NEH513A	NEH514A
VOLT REG AUTO SW (LOCAL)	NEH513B	NEH514B
VOLT REG MAN. SW (REMOTE)	NEH515A	NEH516A
VOLT REG MAN. SW (LOCAL)	NEH515B	NEH516B
RELAY PANEL - RLY PNL	NE107	NE106
MAIN CONTROL BOARD - MCB	RLO15	RLO16
VOLT CONTROL FREEZE	NB03 E-22NB05 XNB01 E-22NB07	NB04 E-22NB06 XNB02 E-22NB07

**NOTES**  
 1. THE MASTER TRANSFER SWITCH AND DIESEL START/STOP SWITCH ARE PART OF THE KJ SYSTEM AND APPEAR ON LOGIC DIAGRAM E-22KJ01.

NO	DATE	REVISIONS	BY	CHK	DES	PROJ	APPR
5	041905	INCORP. RFR 22941A.	MAL	RLW	N/A	TWS	
4	080601	INCORP. MP 99-1038C.	SKC	JHK	N/A	AMR	
3	060701	INCORP. MP 99-1044A.	MAL	RLW	N/A	AMR	
2	022900	INCORP. MP 99-1038B	SKC	JHK	N/A	AMR	
1	110890	INCORP. CMP 88-1006 FCN-02.	J	SKC	N/A	JHK	
	081490	INITIAL ISSUE SUPERCEDES E-22NE01 (0) REV 0. REFLECTS TURNOVER TO US ISSUE PER EPP-EE-04024.	MAL	SKC		JHK	

**BECHTEL**  
 GAITHERSBURG, MARYLAND

**SNUPPS**

STANDBY GENERATION  
 EXCITATION CONTROL  
 LOGIC DIAGRAM  
 (FSAR FIGURE 8.3-3)

UTILITY DRAWING NO	REV
10466	E-22NE01 (0) 5

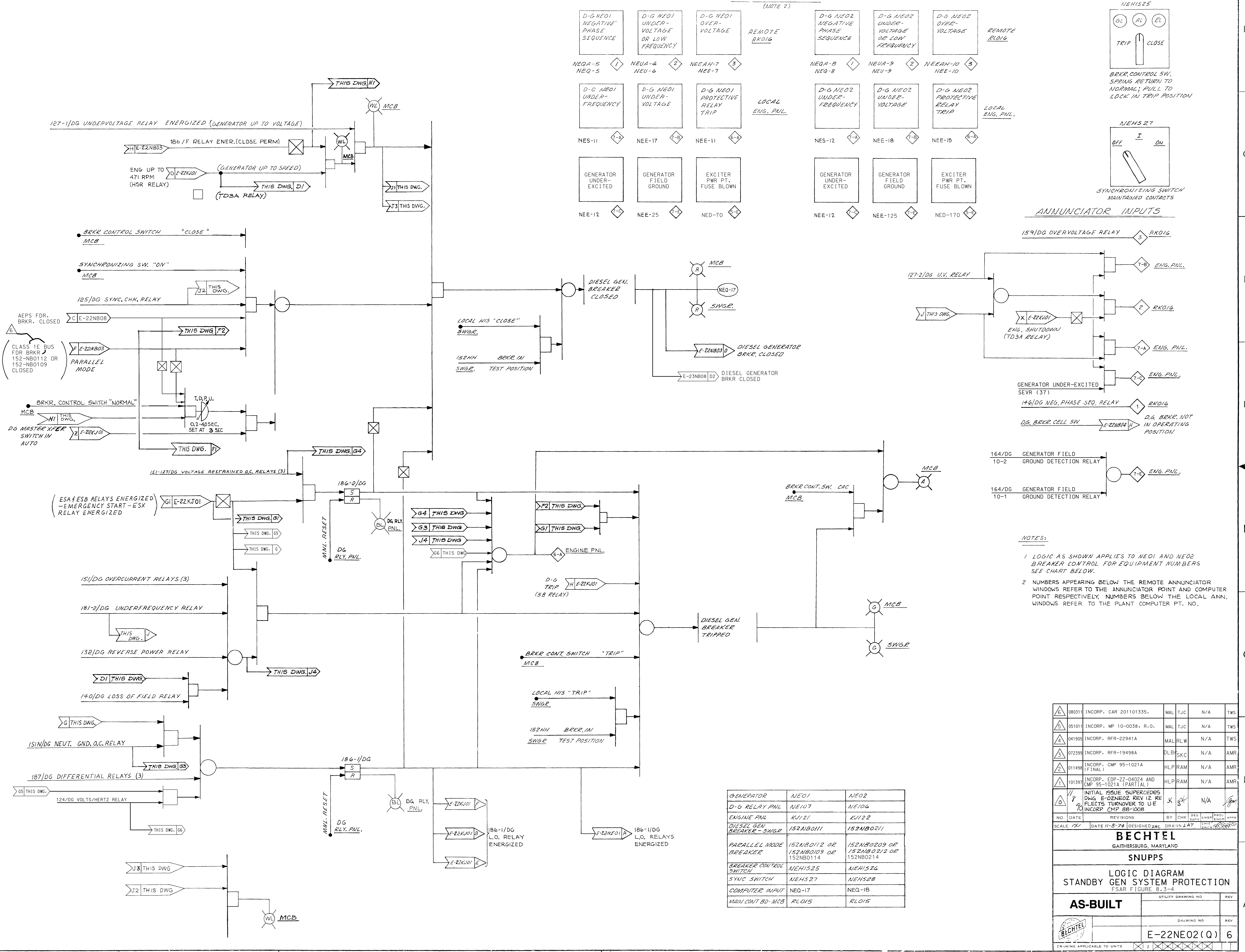
AS-BUILT

This drawing and the design it covers is the property of the Utilities which are participating in the SNUPPS Project. It is loaned on the borrower's express agreement that it will not be reproduced, copied, loaned, exhibited, or used except in the limited way and private use permitted by written consent given by the SNUPPS Utilities to the borrower.

H  
G  
F  
E  
D  
C  
B  
A



E-22NE02 (Q)



**ANNUNCIATOR WINDOWS (NOTE 2)**

D-G NFO1 NEGATIVE PHASE SEQUENCE NEQA-5 NEQ-5	D-G NFO1 UNDER-VOLTAGE OR LOW FREQUENCY NEUA-6 NEU-6	D-G NFO1 OVER-VOLTAGE NEEAH-7 NEE-7	D-G NFO2 NEGATIVE PHASE SEQUENCE NEQA-8 NEQ-8	D-G NFO2 UNDER-VOLTAGE OR LOW FREQUENCY NEUA-9 NEU-9	D-G NFO2 OVER-VOLTAGE NEEAH-10 NEE-10
D-G NFO1 UNDER-FREQUENCY NES-11 T-A	D-G NFO1 UNDER-VOLTAGE NEE-17 T-B	D-G NFO1 PROTECTIVE RELAY TRIP NEE-11 E-A	D-G NFO2 UNDER-FREQUENCY NES-12 T-B	D-G NFO2 UNDER-VOLTAGE NEE-18 T-B	D-G NFO2 PROTECTIVE RELAY TRIP NEE-18 E-B
GENERATOR UNDER-EXCITED NEE-12 T-C	GENERATOR FIELD GROUND NEE-25 T-D	EXCITER PWR PT. FUSE BLOWN NED-70 E-C	GENERATOR UNDER-EXCITED NEE-12 T-C	GENERATOR FIELD GROUND NEE-125 T-E	EXCITER PWR PT. FUSE BLOWN NED-170 E-D

**REMOTE CONTROL SWITCHES (RLO15)**  
(SEE TABLE FOR ALT. SW. NO.'S.)

NEHS25

TRIP CLOSE

BRKR CONTROL SW. SPRING RETURN TO NORMAL; PULL TO LOCK IN TRIP POSITION

NEHS27

OFF I ON

SYNCHRONIZING SWITCH MAINTAINED CONTACTS

**ANNUNCIATOR INPUTS**

159/DG OVERVOLTAGE RELAY 3 RKO16

127-2/DG U.V. RELAY

127-2/DG U.V. RELAY

146/DG NEG. PHASE SEQ. RELAY 1 RKO16

D.G. BRKR. CELL SW E-22NB04 H

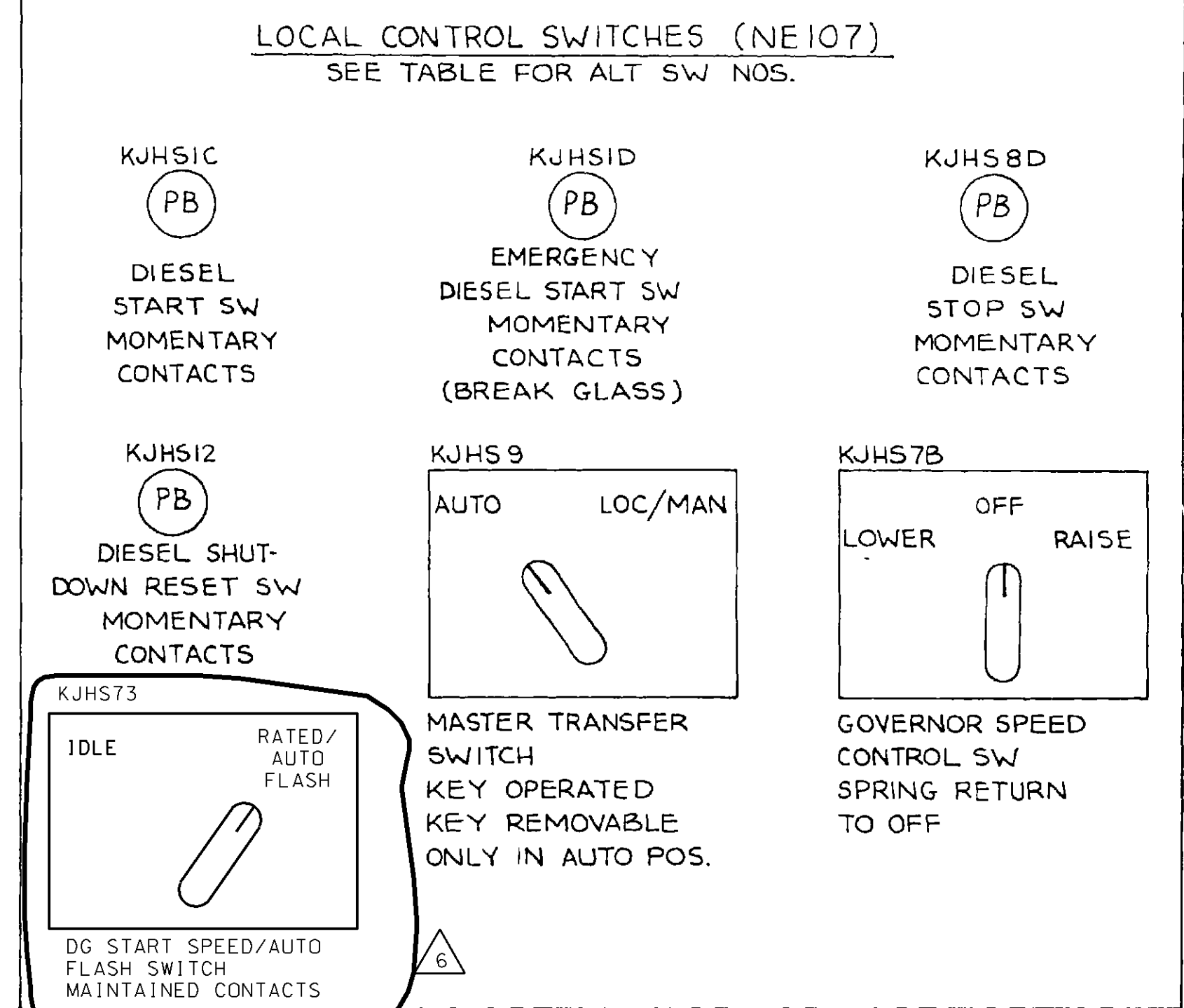
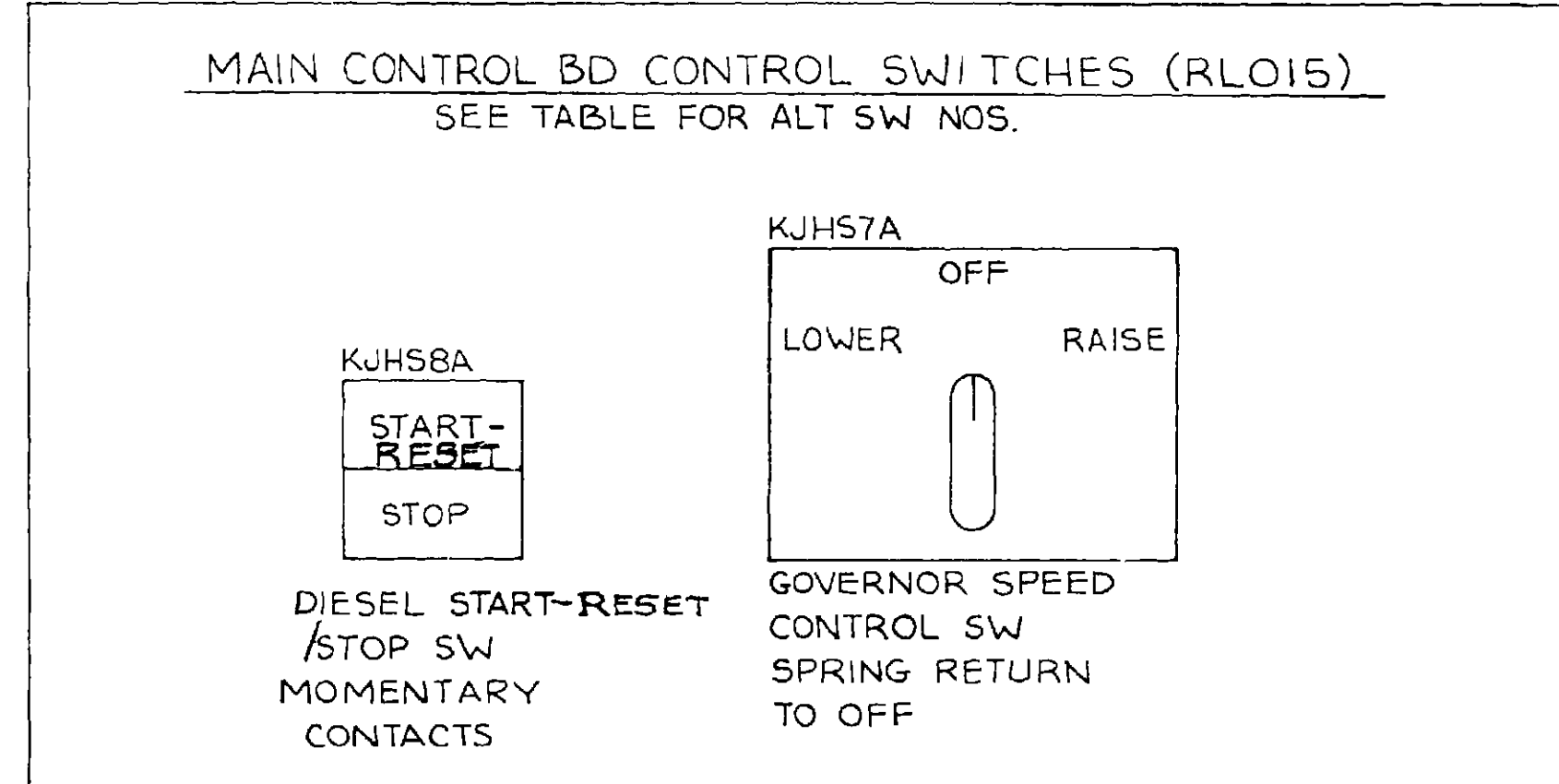
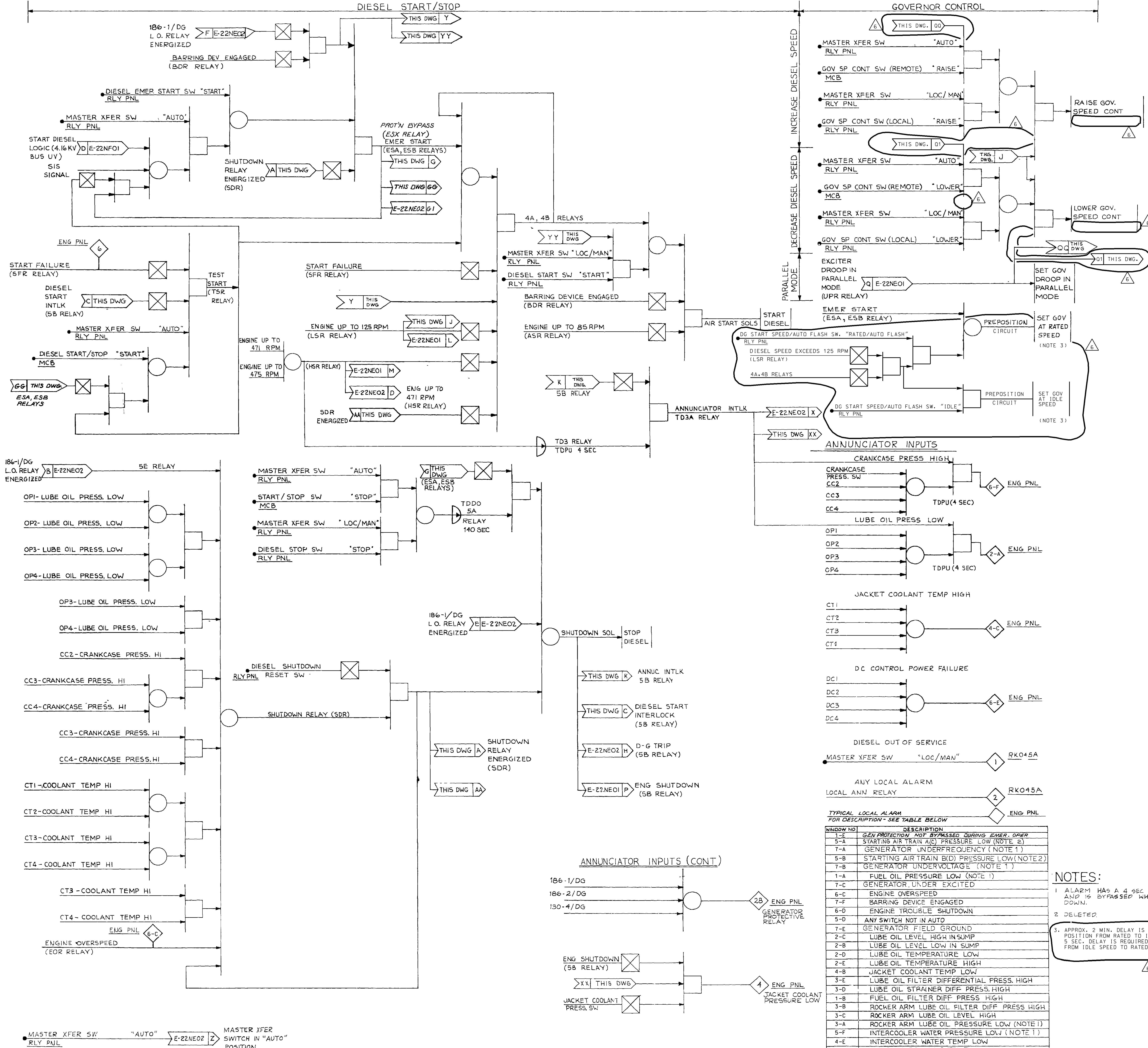
164/DG GENERATOR FIELD GROUND DETECTION RELAY 10-2 T-B ENG. PNL.

164/DG GENERATOR FIELD GROUND DETECTION RELAY 10-1 T-B ENG. PNL.

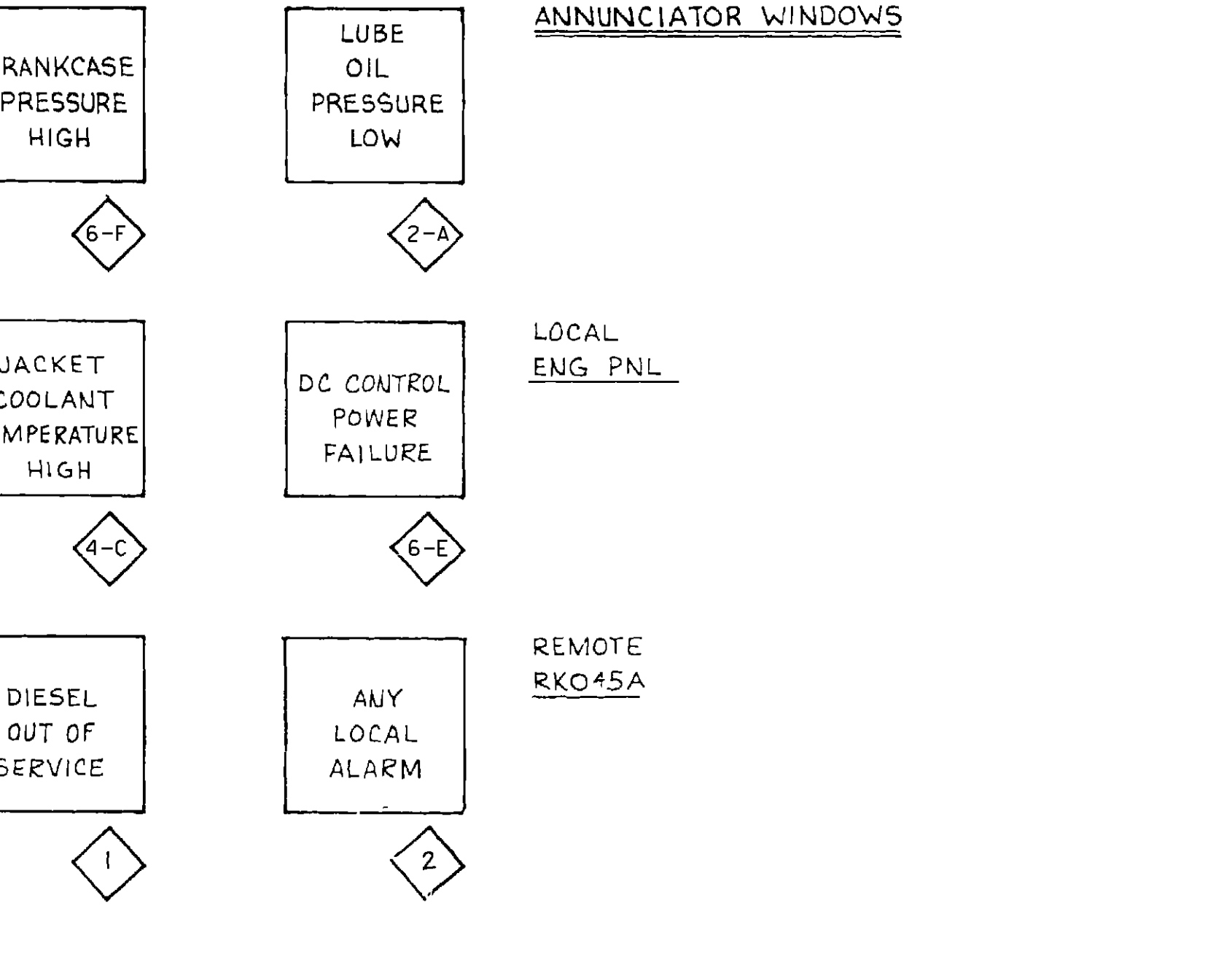
- NOTES:**
- LOGIC AS SHOWN APPLIES TO NEO1 AND NEO2 BREAKER CONTROL FOR EQUIPMENT NUMBERS SEE CHART BELOW.
  - NUMBERS APPEARING BELOW THE REMOTE ANNUNCIATOR WINDOWS REFER TO THE ANNUNCIATOR POINT AND COMPUTER POINT RESPECTIVELY. NUMBERS BELOW THE LOCAL ANN. WINDOWS REFER TO THE PLANT COMPUTER PT. NO.

GENERATOR	NEO1	NEO2
D-G RELAY PNL	NE107	NE106
ENGINE PNL	K1121	K1122
DIESEL GEN BREAKER - SWGR	152NB011	152NB021
PARALLEL MODE BREAKER	152NB0112 OR 152NB0109 OR 152NB0114	152NB0209 OR 152NB0212 OR 152NB0214
BREAKER CONTROL SWITCH	NEHS25	NEHS26
SYNC SWITCH	NEHS27	NEHS28
COMPUTER INPUT	NEQ-17	NEQ-18
MAIN CONT BD - MCB	RLO15	RLO15

6	080311	INCRP. CAR 201101335.	MAL	TJC	N/A	TWS		
5	051011	INCRP. MP 10-0038, R.O.	MAL	TJC	N/A	TWS		
4	041905	INCRP. RFR-22941A	MAL	RLW	N/A	TWS		
3	072399	INCRP. RFR-19498A	DLB	SKC	N/A	AMR		
2	011498	INCRP. CMP 95-1021A (FINAL)	HLP	RAM	N/A	AMR		
1	101397	INCRP. EDP-ZZ-04024 AND CMP 95-1021A (PARTIAL)	HLP	RAM	N/A	AMR		
1	101397	INITIAL ISSUE SUPERCEDES DWG. E-02NE02 REV 12 RE FLEETS TURNOVER TO UE INCORP. CMP 88-100B	J	S	N/A	JMS		
NO	DATE	REVISIONS	BY	CHK	DES	ENGR	PRD	APPD
SCALE 1/4		DATE 11-8-74	DESIGNED BY	DRC	DRAWN BY	CHKD BY	ENGR	PRD
<b>BECHTEL</b> GAITHERSBURG, MARYLAND								
<b>SNUPPS</b>								
LOGIC DIAGRAM STANDBY GEN SYSTEM PROTECTION FSAR FIGURE 8.3-4								
<b>AS-BUILT</b>			UTILITY DRAWING NO	REV				
			DESIGN NO	REV				
			<b>E-22NE02 (Q)</b>		<b>6</b>			
DRAWING APPLICABLE TO UNITS								



EQUIPMENT DESCRIPTION	DIESEL KKJ01A	DIESEL KKJ01B
DIESEL START STOP SW	KJHS1C	KJHS1D
GOV. SPEED CONTROL SW (REMOTE)	KJHS7A	KJHS108A
GOV. SPEED CONTROL SW (LOCAL)	KJHS7B	KJHS107B
DIESEL START SW	KJHS1C	KJHS101C
DIESEL STOP SW	KJHS1D	KJHS108D
DIESEL EMERGENCY START	KJHS1D	KJHS101D
DIESEL SHUTDOWN RESET SW	KJHS12	KJHS112
MASTER TRANSFER SW	KJHS9	KJHS109
MAIN CONTROL BD - MCB	RLO15	RLO15
RELAY PANEL - RLY PNL	NE107	NE106
ENGINE PANEL - ENG PNL	KJ121	KJ122
AIR START SOLENOIDS	KJPV1A, 1B	KJPV101A, 101B
SHUTDOWN SOLENOIDS	KJPV8	KJPV108
DG START SPEED/AUTO FLASH SW	KJHS73	KJHS173



TYPICAL LOCAL ALARM FOR DESCRIPTION - SEE TABLE BELOW

WINDOW NO	DESCRIPTION
1-K	GEN PROTECTION NOT BYPASSED DURING EXCITER OPER
2-A	STARTING AIR TRAIN (A) PRESSURE LOW (NOTE 2)
7-A	GENERATOR UNDERFREQUENCY (NOTE 1)
5-B	STARTING AIR TRAIN (B) PRESSURE LOW (NOTE 2)
7-B	GENERATOR UNDERVOLTAGE (NOTE 1)
1-A	FUEL OIL PRESSURE LOW (NOTE 1)
7-C	GENERATOR UNDER EXCITED
6-C	ENGINE OVERSPEED
7-F	BARRING DEVICE ENGAGED
6-D	ENGINE TROUBLE SHUTDOWN
5-D	ANY SWITCH NOT IN AUTO
7-E	GENERATOR FIELD GROUND
2-C	LUBE OIL LEVEL HIGH IN SUMP
2-B	LUBE OIL LEVEL LOW IN SUMP
2-D	LUBE OIL TEMPERATURE LOW
2-E	LUBE OIL TEMPERATURE HIGH
4-B	JACKET COOLANT TEMP LOW
3-E	LUBE OIL FILTER DIFFERENTIAL PRESS. HIGH
3-D	LUBE OIL STRAINER DIFF. PRESS. HIGH
1-B	FUEL OIL FILTER DIFF. PRESS. HIGH
3-B	ROCKER ARM LUBE OIL FILTER DIFF. PRESS. HIGH
3-C	ROCKER ARM LUBE OIL LEVEL HIGH
3-A	ROCKER ARM LUBE OIL PRESSURE LOW (NOTE 1)
5-F	INTERCOOLER WATER PRESSURE LOW (NOTE 1)
4-E	INTERCOOLER WATER TEMP LOW
4-F	INTERCOOLER WATER TEMP HIGH
6-A	DIESEL START FAILURE
4-D	JACKET COOLANT EXPANSION TANK LEVEL LOW
1-C	FUEL OIL STRAINER DIFF. PRESS. HIGH
6-B	DIESEL BEARING TEMP HIGH
5-E	EXCITER PWR PT FUSE STATUS
1-F	DCM01A (DCM01B) VENTILATION SUPPLY FAN BREAKER TRIPPED

NOTES:

- ALARM HAS A 4 SEC. DELAY TO ENERGIZE AND IS BYPASSED WHEN ENGINE IS SHUT DOWN.
- DELETED
- APPROX. 2 MIN. DELAY IS REQUIRED TO PRE-POSITION FROM RATED TO IDLE SPEED. APPROX. 5 SEC. DELAY IS REQUIRED TO PRE-POSITION FROM IDLE TO RATED.

NO	DATE	REVISIONS	BY	CHK	DES	ENGR	PROJ	APP
060701	INCORP. MP 99-1044A.		MAL	RLW	N/A			AMR
072299	INCORP. RFR-19498A		DLBF	SAC	N/A			AMR
011498	INCORP. CMP 95-1021A (FINAL)		HLP	RAM	N/A			AMR
101391	INCORP. EDP-22-04024 AND CMP 95-1021A (PARTIAL)		HLP	RAM	N/A			AMR
110220	INCORP. RFR-15366A		MAL	RLW	N/A			AMR
110220	INCORP. DEC-0833							AMR
110220	INITIAL ISSUE SUPERCEDES DWG E-02KJ01(0) REV 6 RELECTS TURNOVER TO BE INCORP. RFR-00758A							AMR

**BECHTEL**  
GAITHERSBURG, MARYLAND

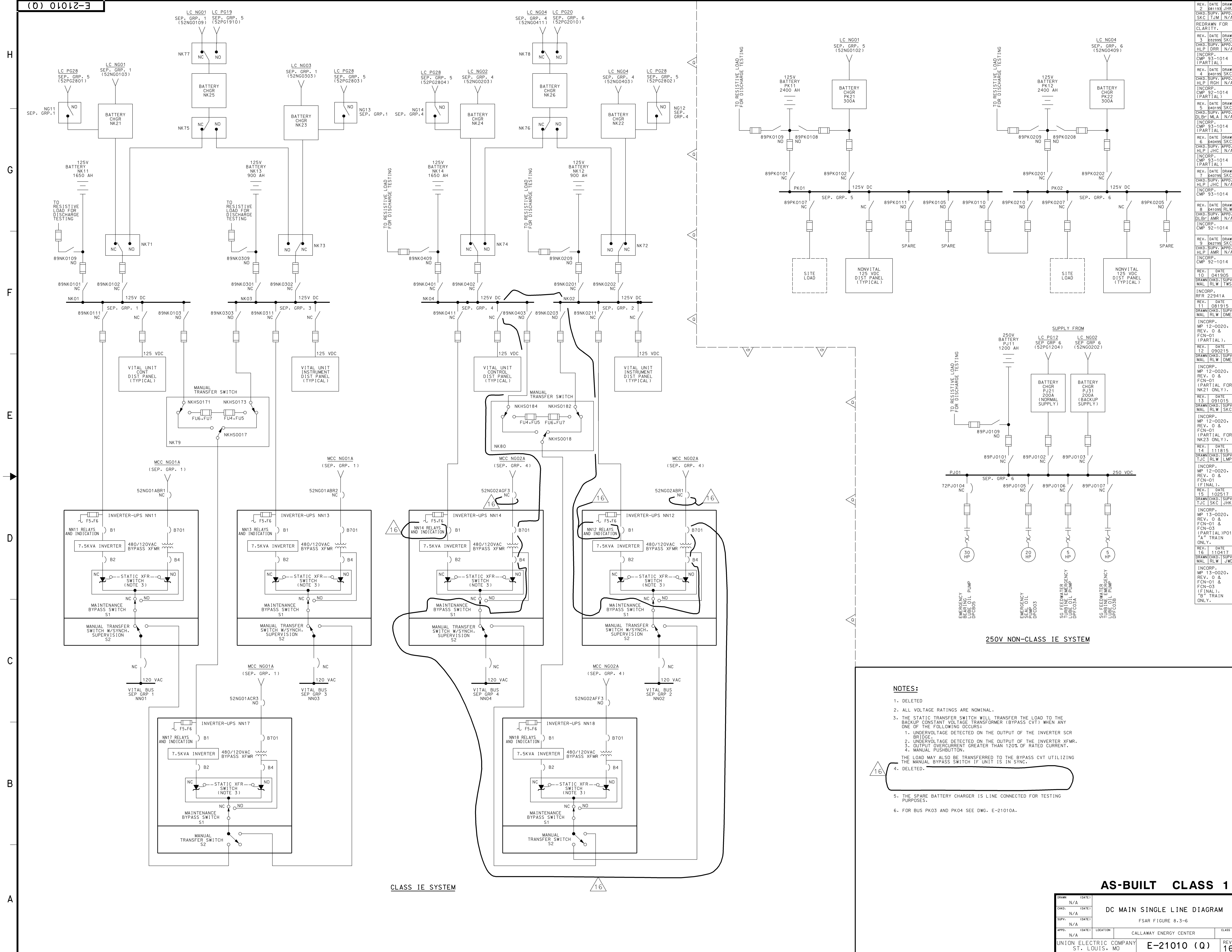
**SNUPPS**

STANDBY GENERATION ENGINE AND GOVERNOR CONTROL LOGIC DIAGRAM

**AS-BUILT**

UTILITY DRAWING NO	REV
10466	E-22KJ01 (0) 6



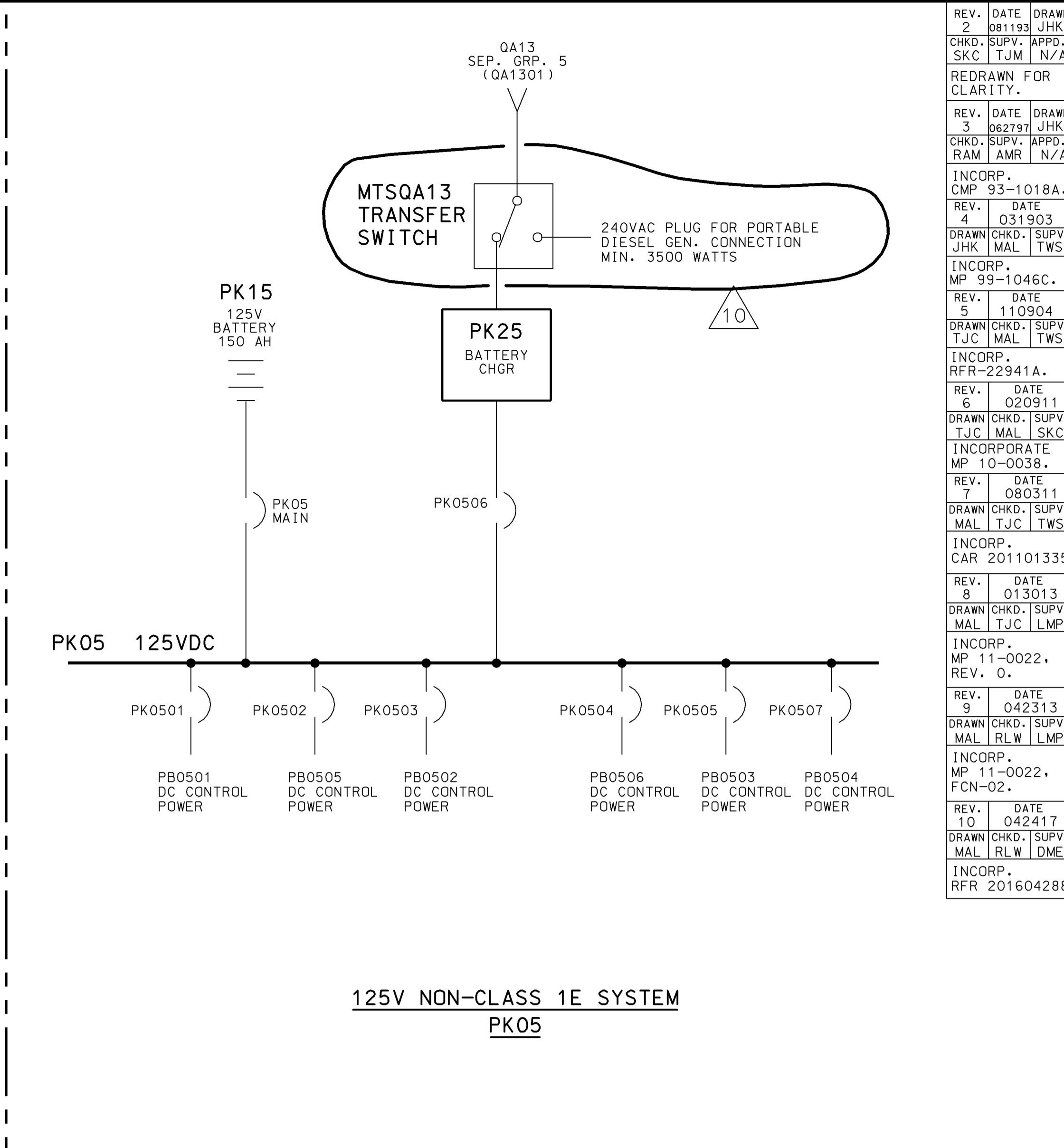
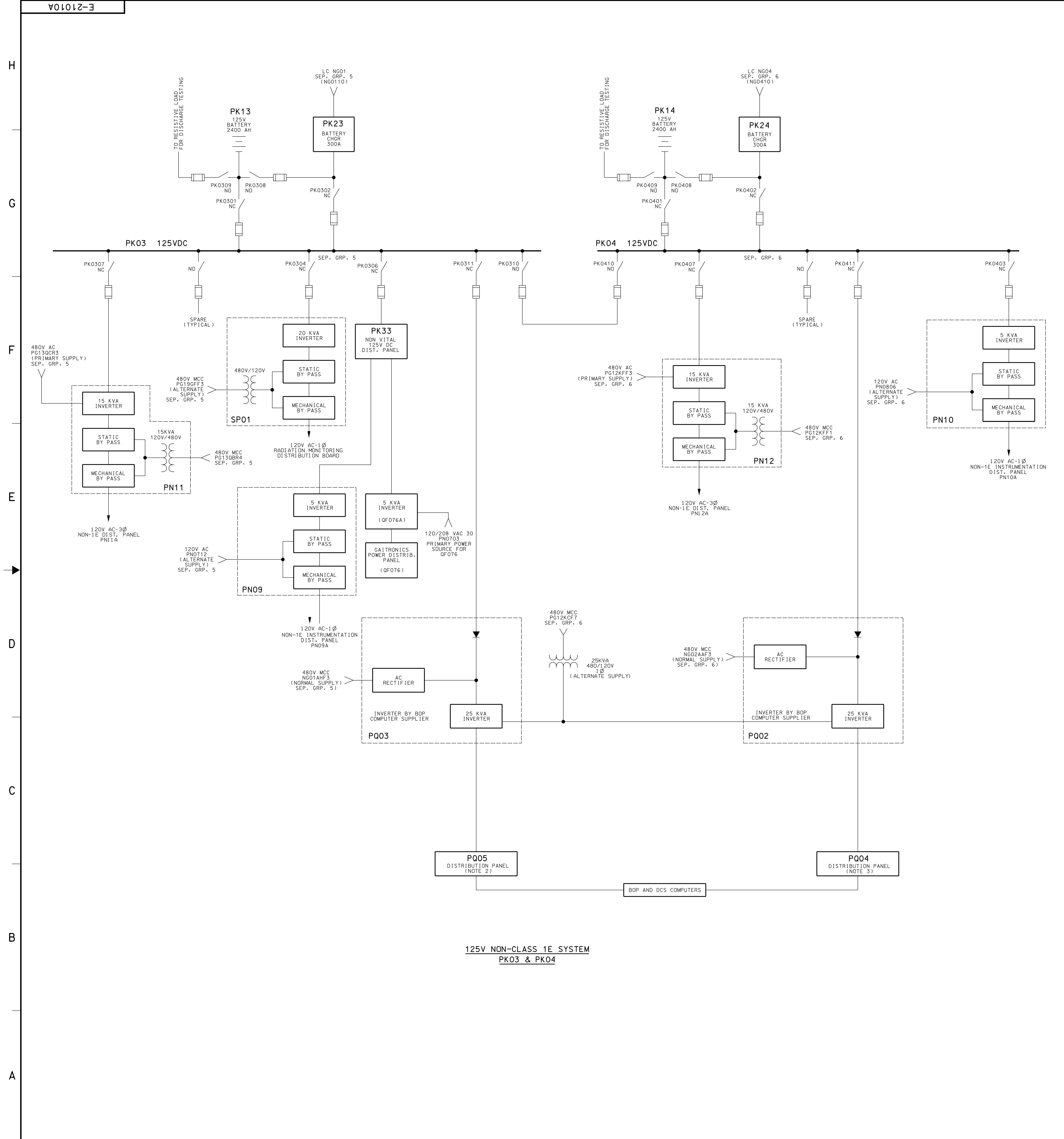


REV.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	081913	JHK	SKC	TJM	N/A
2	081913	SKC	TJM	N/A	REDRAWN FOR CLARITY.
3	032895	SKC	SKC	N/A	N/A
4	040995	SKC	HLP	DRR	N/A
5	051014	(PARTIAL)			
6	040995	SKC	HLP	RGH	N/A
7	051014	(PARTIAL)			
8	040995	SKC	HLP	MLA	N/A
9	051014	(PARTIAL)			
10	040995	SKC	HLP	JHC	N/A
11	081915	DRW	SKC	MLR	N/A
12	092015	DRW	SKC	MLR	N/A
13	091015	DRW	SKC	MLR	N/A
14	111815	DRW	SKC	MLR	N/A
15	102517	DRW	SKC	JHK	N/A
16	110417	DRW	SKC	JHK	N/A
17	130220	DRW	SKC	JHK	N/A

- NOTES:**
- DELETED
  - ALL VOLTAGE RATINGS ARE NOMINAL.
  - THE STATIC TRANSFER SWITCH WILL TRANSFER THE LOAD TO THE BACKUP CONSTANT VOLTAGE TRANSFORMER (BYPASS CVT) WHEN ANY ONE OF THE FOLLOWING OCCURS:
    - UNDERVOLTAGE DETECTED ON THE OUTPUT OF THE INVERTER SCR BRIDGE.
    - UNDERVOLTAGE DETECTED ON THE OUTPUT OF THE INVERTER XFMR.
    - OUTPUT OVERCURRENT GREATER THAN 120% OF RATED CURRENT.
    - MANUAL PUSHBUTTON.
 THE LOAD MAY ALSO BE TRANSFERRED TO THE BYPASS CVT UTILIZING THE MANUAL BYPASS SWITCH IF UNIT IS IN SYNC.
  - DELETED.
  - THE SPARE BATTERY CHARGER IS LINE CONNECTED FOR TESTING PURPOSES.
  - FOR BUS PK03 AND PK04 SEE DWG. E-21010A.

AS-BUILT CLASS 1			
DRAWN	N/A	DATE	
CHKD.	N/A	DATE	
SUPV.	N/A	DATE	
APP'D.	N/A	LOCATION	CALLAWAY ENERGY CENTER
UNION ELECTRIC COMPANY ST. LOUIS, MO			REV. 16

DC MAIN SINGLE LINE DIAGRAM  
FSAR FIGURE 8.3-6



**REFERENCE DRAWINGS:**  
 E-2101 (0)  
 E-23RJ06  
 E-23RJ07  
 E-23SP09

**NOTES:**  
 1. FOR PK01 & PK02 SEE DWG. NO. E-2101 (0).  
 2. SEE DRAWING NO. E-23RJ07 FOR DIST. PANEL DETAIL.  
 3. SEE DRAWING NO. E-23RJ06 FOR DIST. PANEL DETAIL.  
 4. DELETED.

**AS-BUILT CLASS 1**

DRWN	N/A	DATE	
CHKD.	N/A	DATE	
SUPV.	N/A	DATE	
APPD.	N/A	DATE	
UNION ELECTRIC COMPANY		ST. LOUIS, MO	
DC MAIN SINGLE LINE DIAGRAM (PK03, PK04 & PK05 BUS)		FSAR FIGURE 8-3-7	
CALLAWAY ENERGY CENTER		CLASS	
E-21010A		REV.	10

REV.	DATE	DRWN	JHK
01	081193	01	JHK
02	031903	02	JHK
03	031903	03	JHK
04	031903	04	JHK
05	110904	05	JHK
06	020911	06	JHK
07	080311	07	JHK
08	013013	08	JHK
09	042417	09	JHK
10	042417	10	JHK