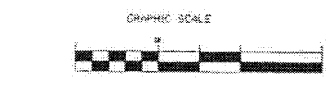
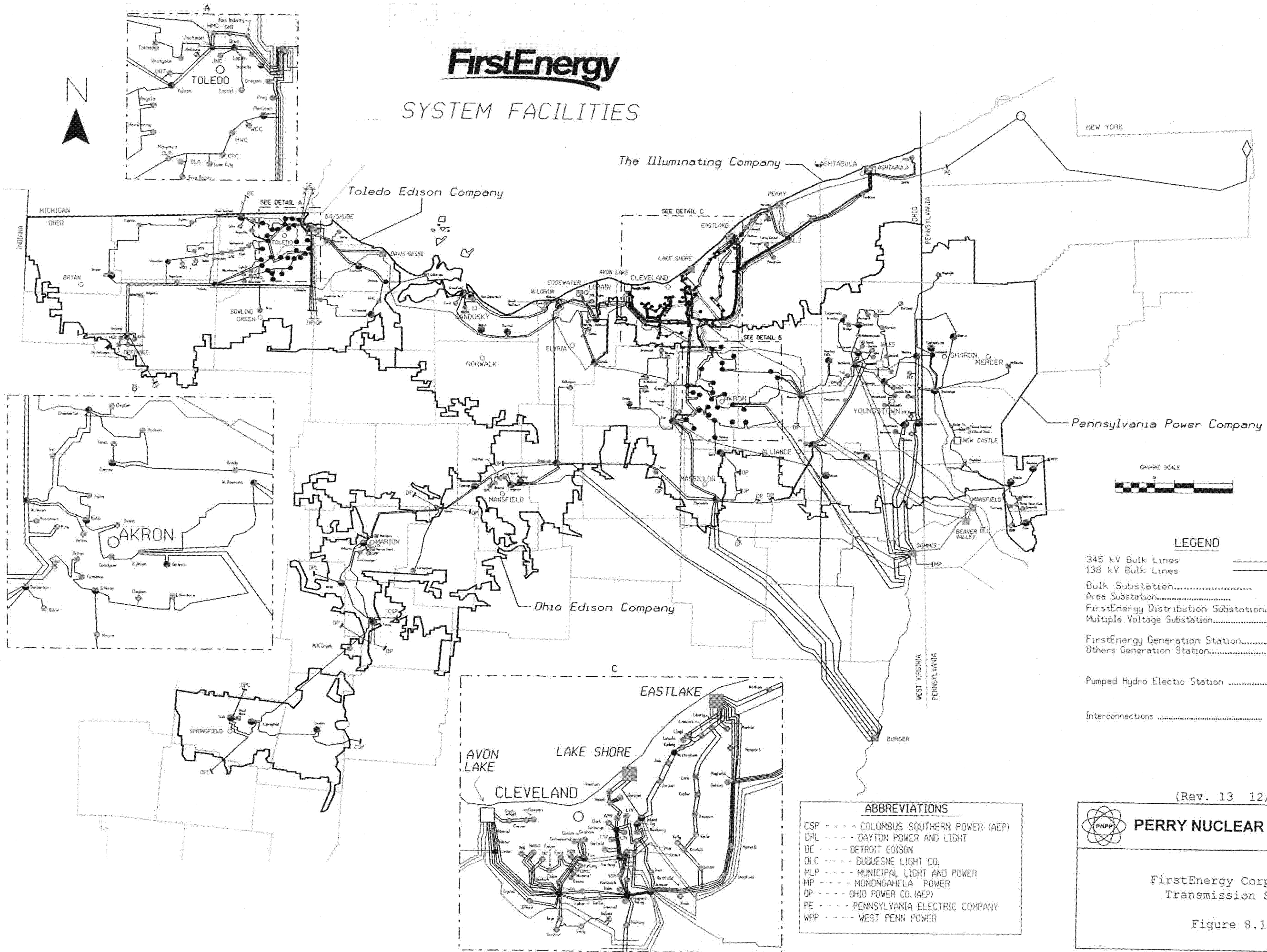


# FirstEnergy

## SYSTEM FACILITIES




**LEGEND**

345 kV Bulk Lines	—————
138 kV Bulk Lines	—————
Bulk Substation	●
Area Substation	○
FirstEnergy Distribution Substation	○
Multiple Voltage Substation	●
FirstEnergy Generation Station	■
Others Generation Station	□
Pumped Hydro Electric Station	◇
Interconnections	↔

**ABBREVIATIONS**

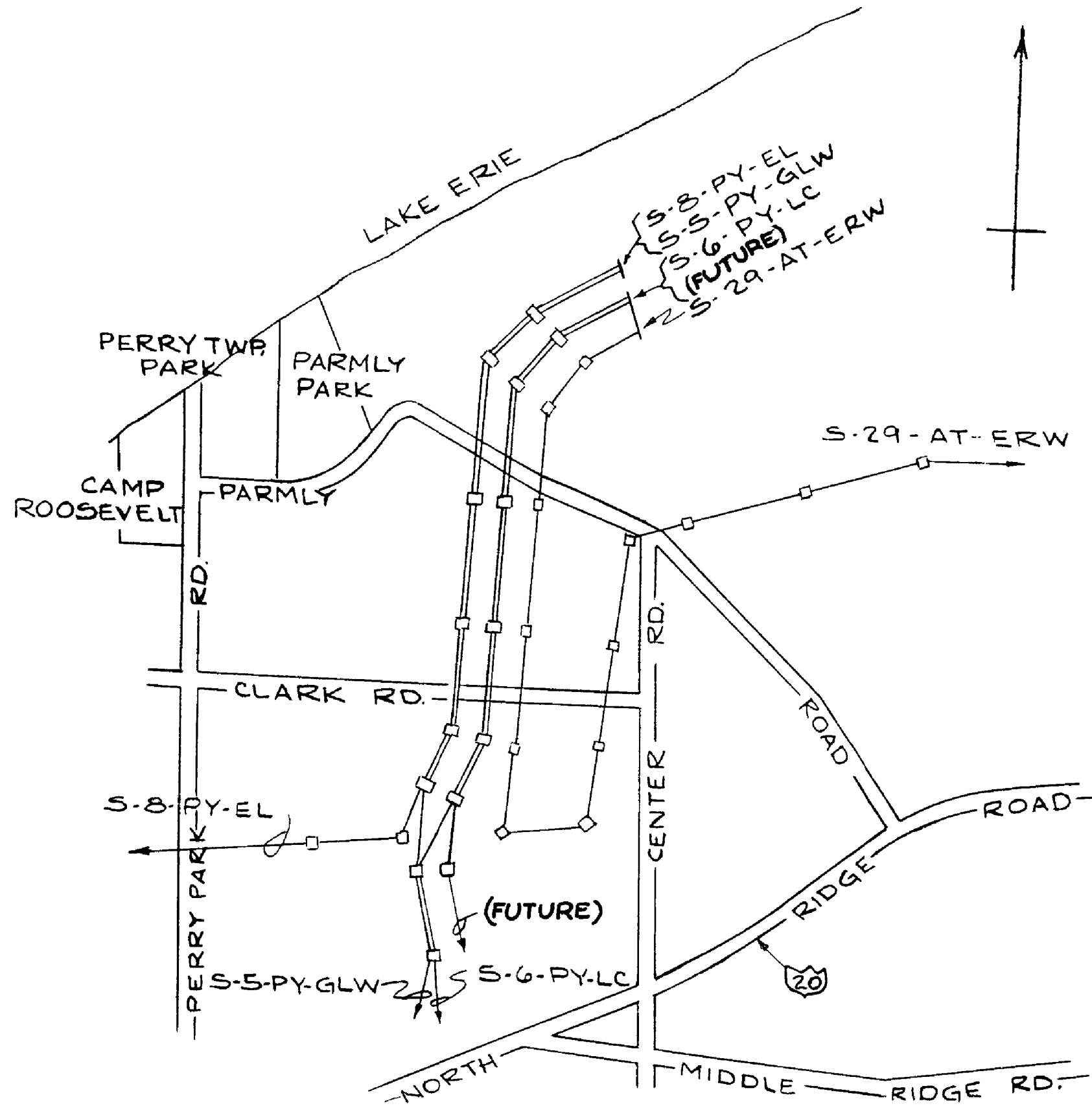
CSP	--- COLUMBUS SOUTHERN POWER (AEP)
DPL	--- DAYTON POWER AND LIGHT
DE	--- DETROIT EDISON
DLC	--- DUQUESNE LIGHT CO.
MLP	--- MUNICIPAL LIGHT AND POWER
MP	--- MONONGAHELA POWER
OP	--- OHIO POWER CO. (AEP)
PE	--- PENNSYLVANIA ELECTRIC COMPANY
WPP	--- WEST PENN POWER

(Rev. 13 12/03)

 **PERRY NUCLEAR POWER PLANT**

FirstEnergy Corporation  
Transmission System

Figure 8.1-1



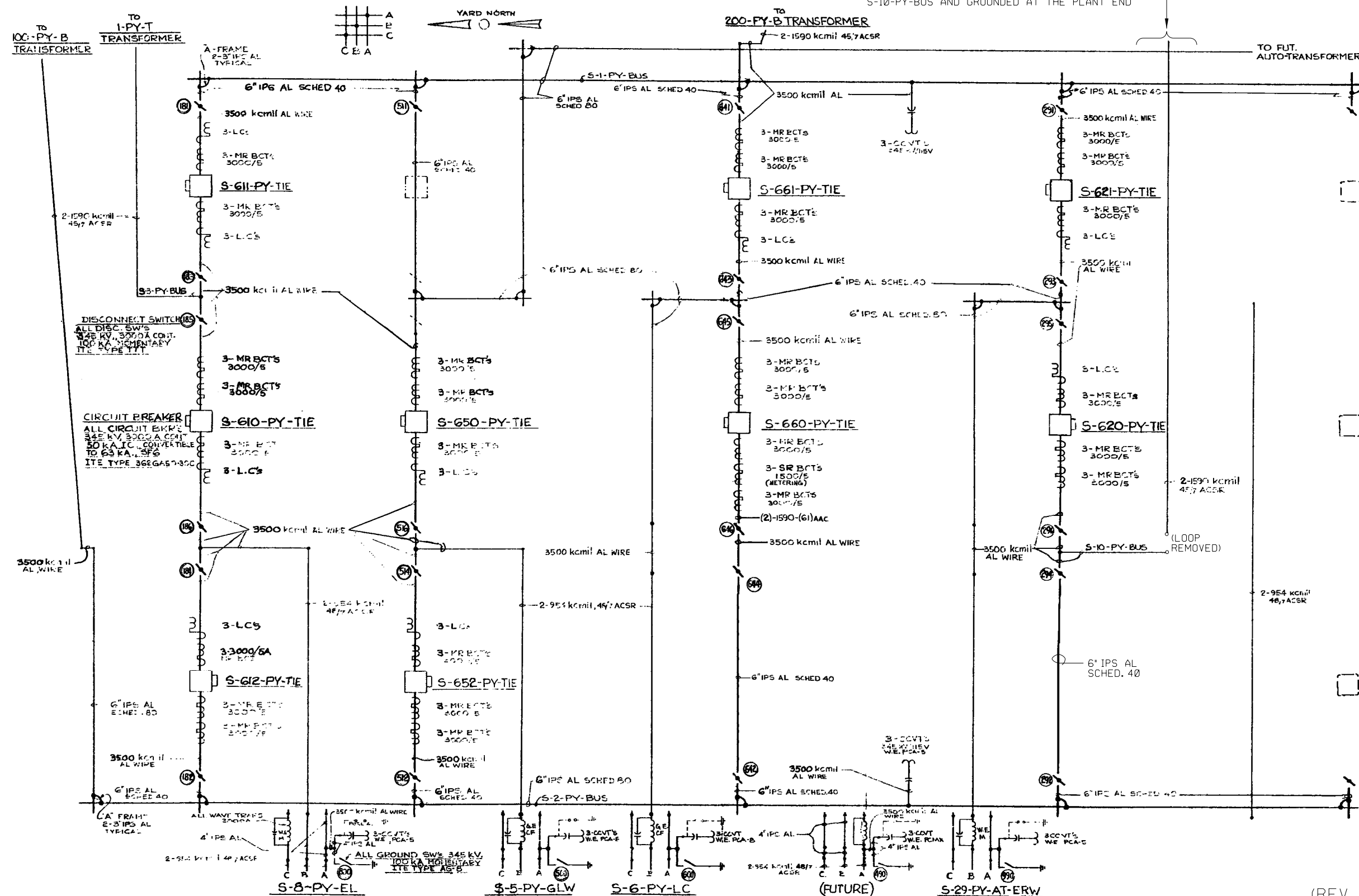
(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT  
 10 CENTER RD., PERRY, OHIO 44081

TRANSMISSION LINES  
 LAYOUT

FIGURE 8.2-1

THE 2-1590kcmil PER PHASE CONDUCTORS FOR 2-PY-T MAIN TRANSFORMER ARE DISCONNECTED FROM S-10-PY-BUS AND GROUNDED AT THE PLANT END

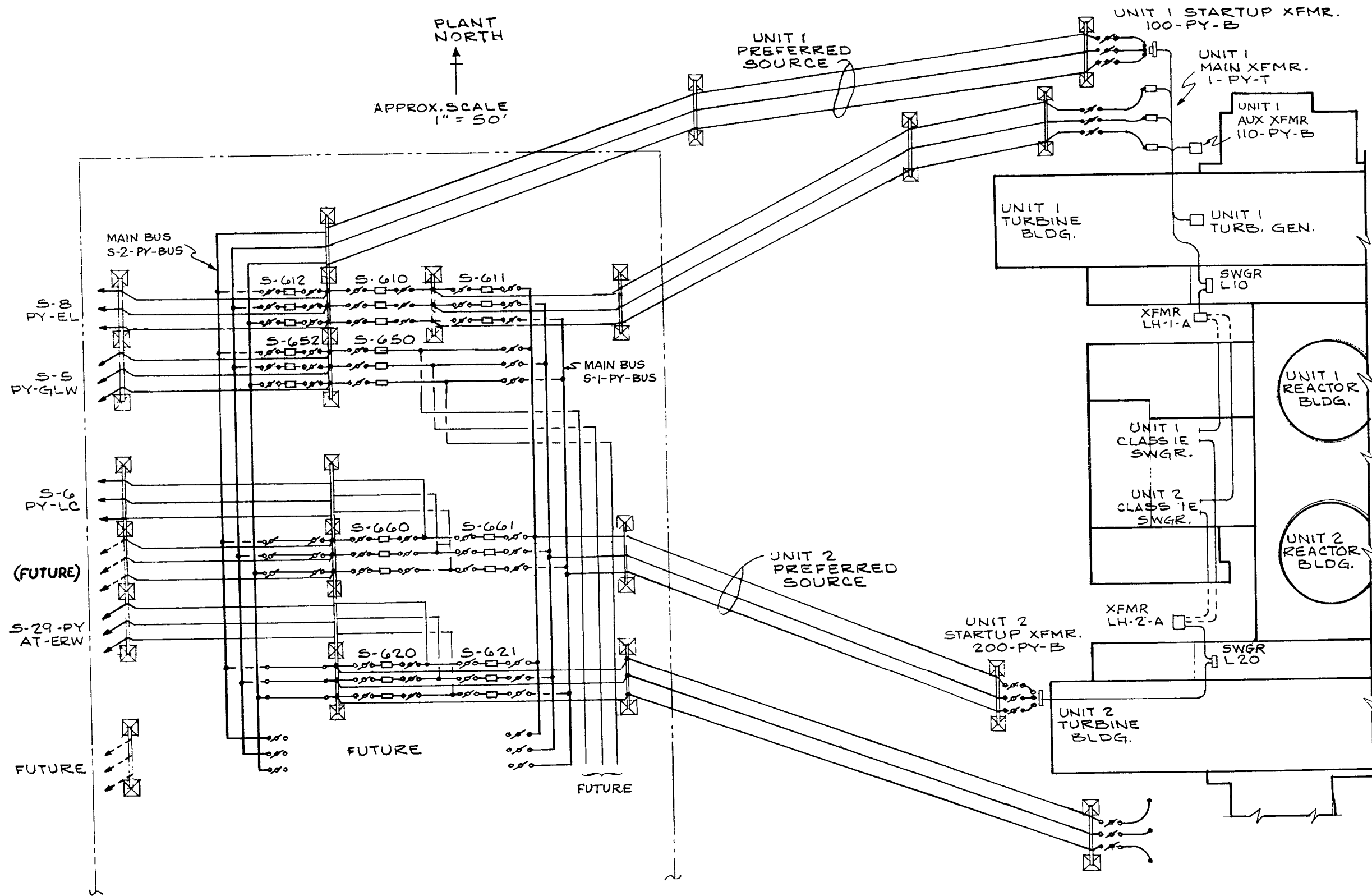


(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT  
10 CENTER RD., PERRY, OHIO 44081

345 KV TRANSMISSION SUBSTATION  
MAIN CONNECTION DIAGRAM

FIGURE 8.2-2

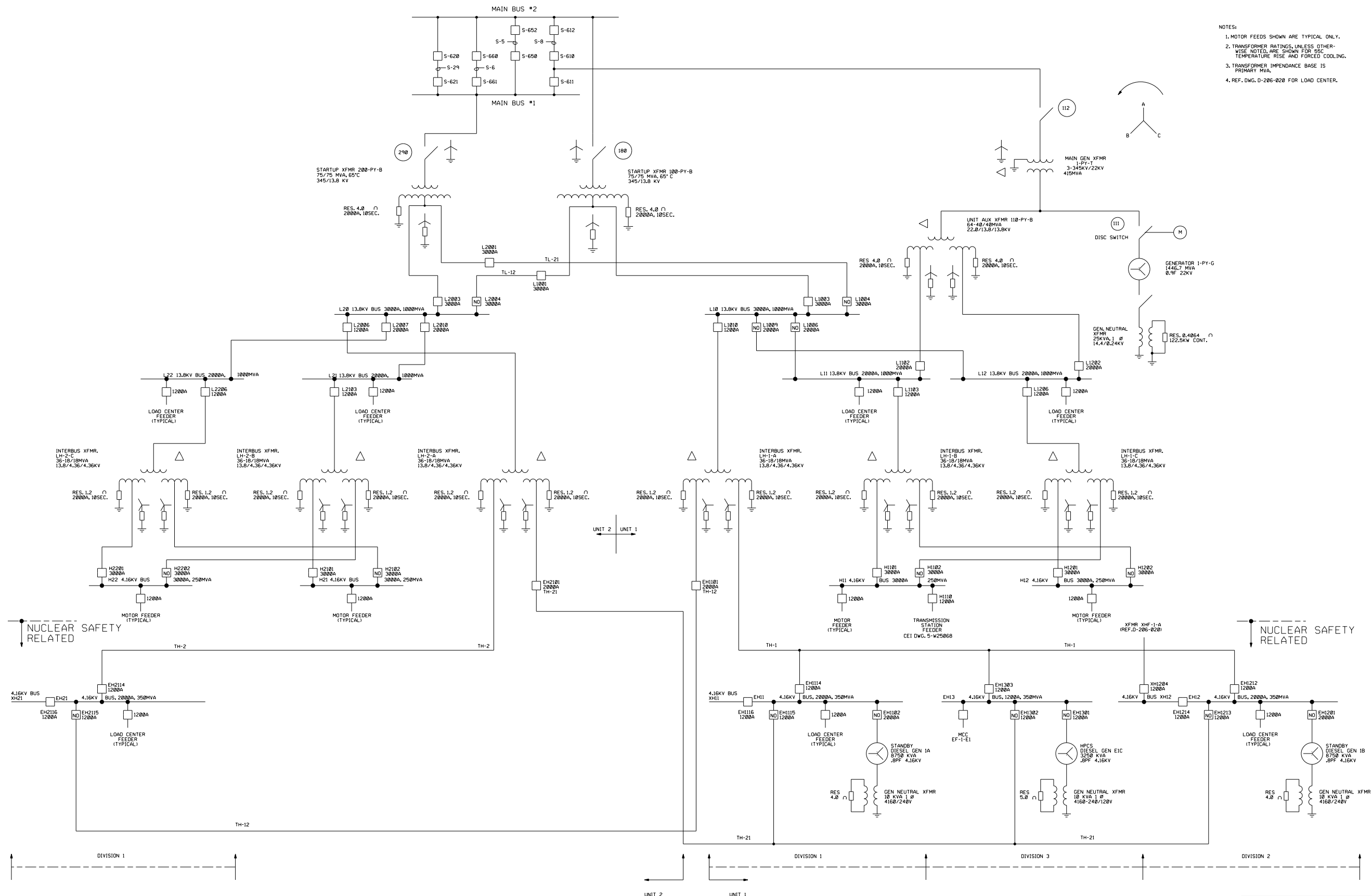


(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT  
10 CENTER RD., PERRY, OHIO 44081

PREFERRED POWER  
SYSTEM LAYOUT

FIGURE 8.2-3



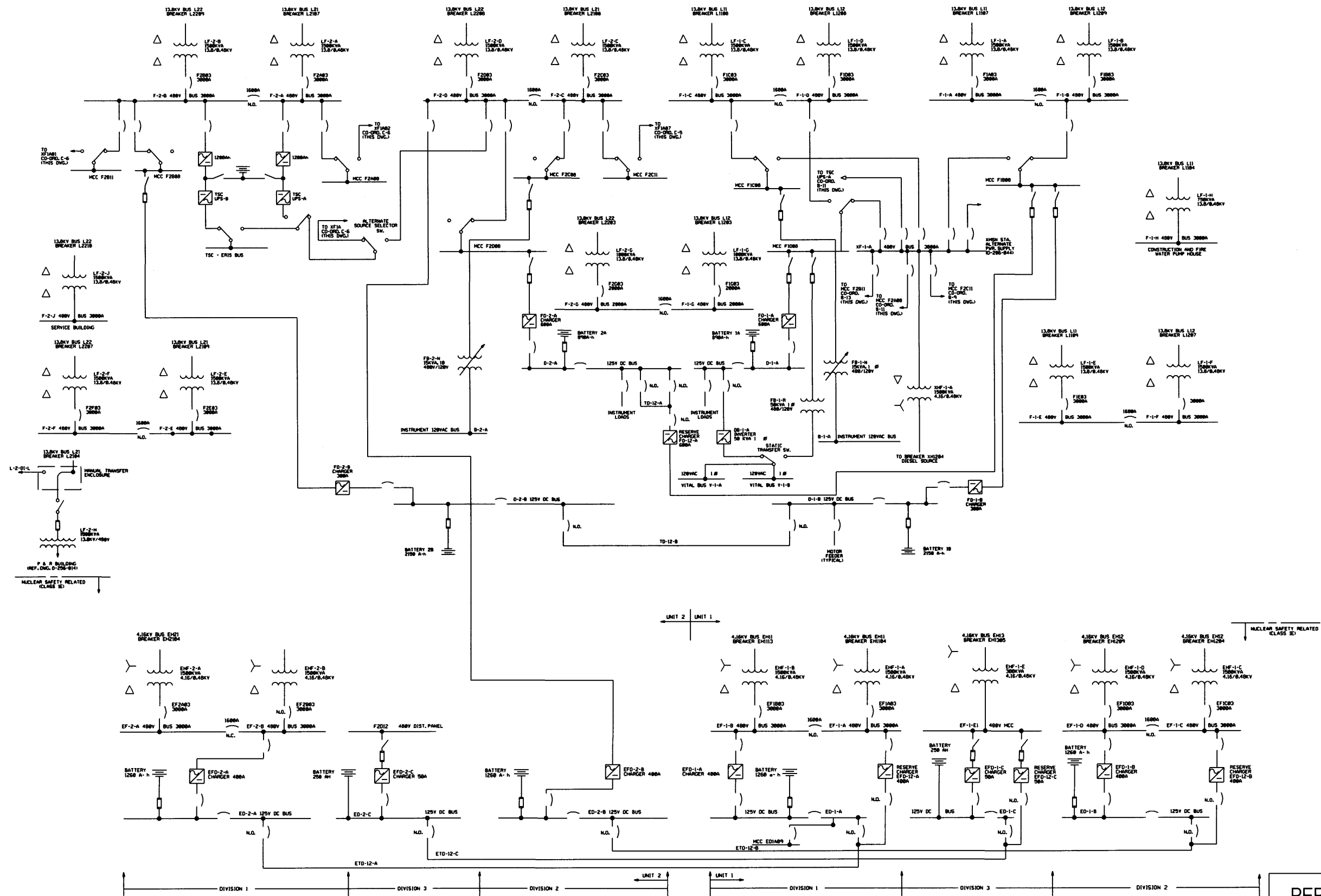
- NOTES:
1. MOTOR FEEDS SHOWN ARE TYPICAL ONLY.
  2. TRANSFORMER RATINGS, UNLESS OTHERWISE NOTED, ARE SHOWN FOR 55°C TEMPERATURE RISE AND FORCED COOLING.
  3. TRANSFORMER IMPEDANCE BASE IS PRIMARY MVA.
  4. REF. DWG. D-206-020 FOR LOAD CENTER.

(REV. 20 10/2017)

**PERRY NUCLEAR POWER PLANT**  
 10 CENTER RD., PERRY, OHIO 44081

---

MAIN ONE LINE DIAGRAM,  
 13.8 KV AND 4.16 KV  
 FIGURE 8.3-1  
 (DWG. D-206-0010-00000)



NOTES:  
1. REF. DWG. D-206-008 FOR 13.8KV AND 4.16KV BUSES.

(REV. 19 10/2015)

**PERRY NUCLEAR POWER PLANT**  
10 CENTER RD., PERRY, OHIO 44081

MAIN ONE LINE DIAGRAM,  
480V AND UNDER  
FIGURE 8.3-2  
(DWG. D-206-0020-00000)

Removed in Accordance with RIS 2015-17

PERRY NUCLEAR POWER PLANT  
10 CENTER RD., PERRY, OHIO 44081

CONTROL COMPLEX AND DIESEL GENERATOR  
BUILDING EQUIPMENT LAYOUT ABOVE  
ELEV. 620'-6", UNITS 1 AND 2  
FIGURE 8.3-3  
(DWG. E-001-0033-00000)

Removed in Accordance with RIS 2015-17

PERRY NUCLEAR POWER PLANT  
10 CENTER RD., PERRY, OHIO 44081

CONTROL COMPLEX EQUIPMENT LAYOUT  
ABOVE ELEV. 628'-6", UNITS 1 AND 2  
FIGURE 8.3-4  
(DWG. E-001-0042-00000)



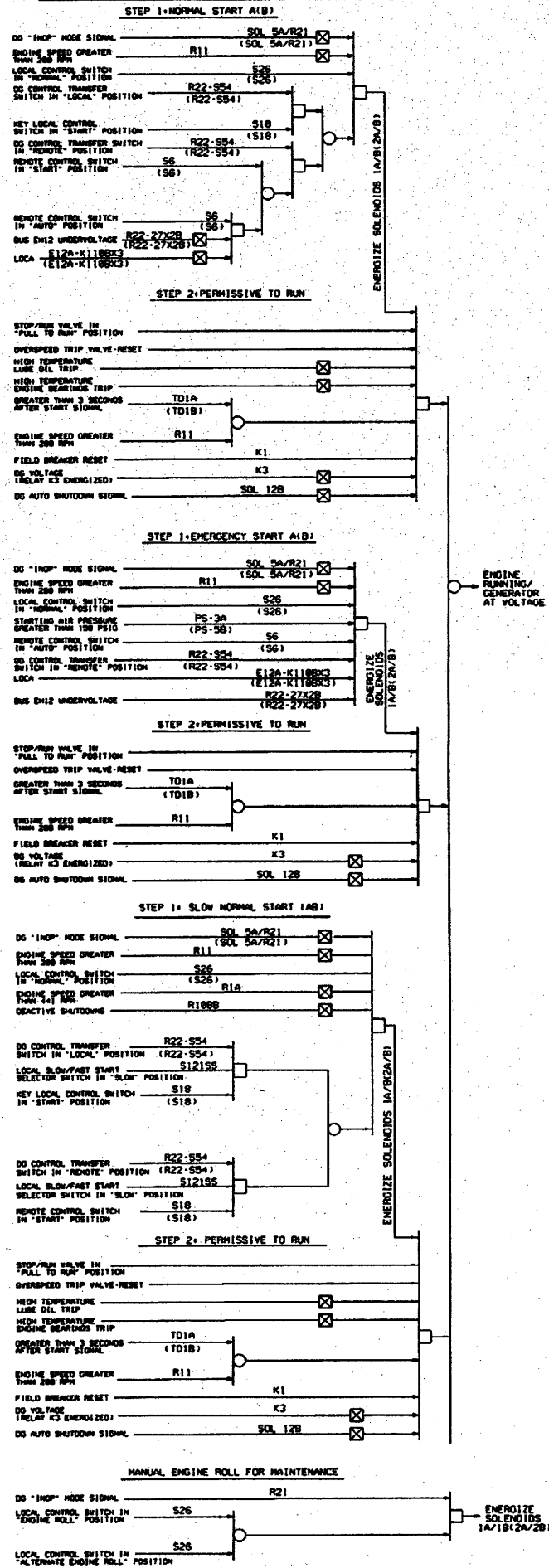
Removed in Accordance with RIS 2015-17

PERRY NUCLEAR POWER PLANT  
10 CENTER RD., PERRY, OHIO 44081

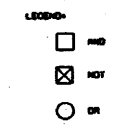
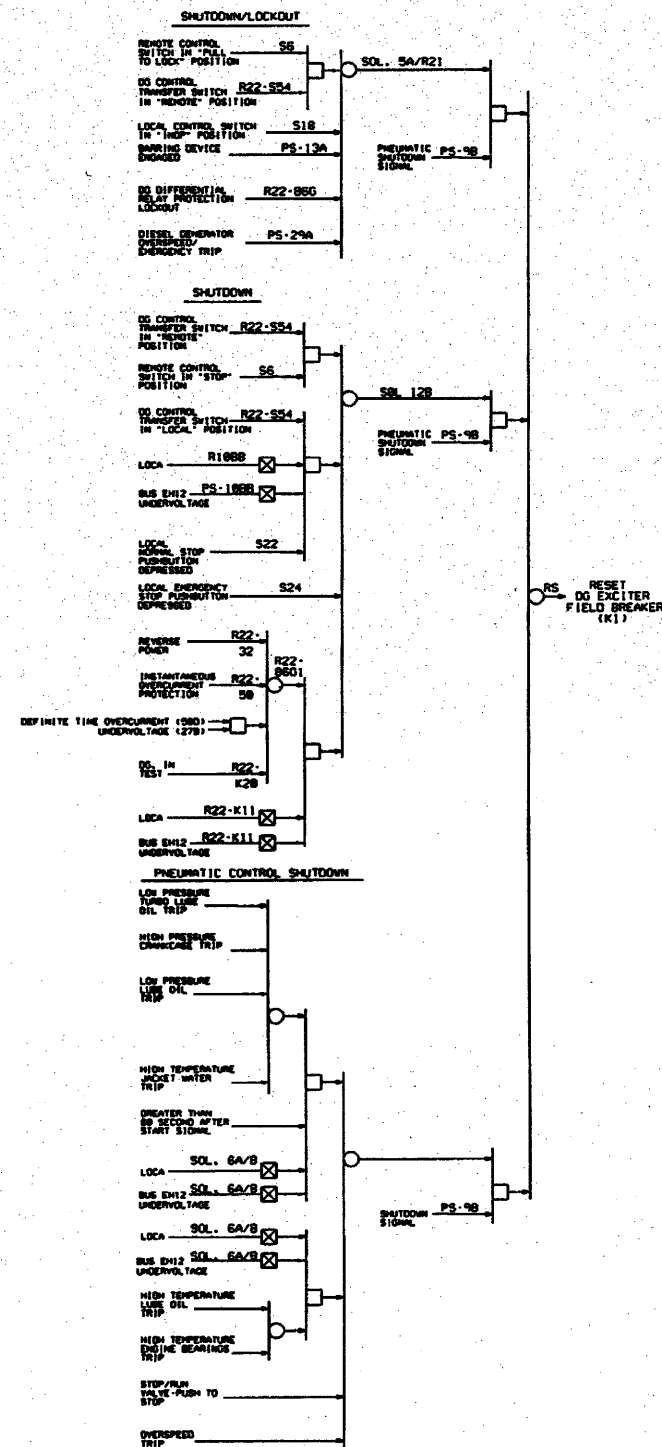
EMERGENCY SERVICE WATER PUMPHOUSE  
EQUIPMENT LAYOUT ABOVE ELEV. 586'-6"  
FIGURE 8.3-5  
(DWG. E-015-0002-00000)



DIVISION 2 STANDBY POWER SUPPLY START-UP



DIVISION 2 STANDBY POWER SUPPLY SHUTDOWN



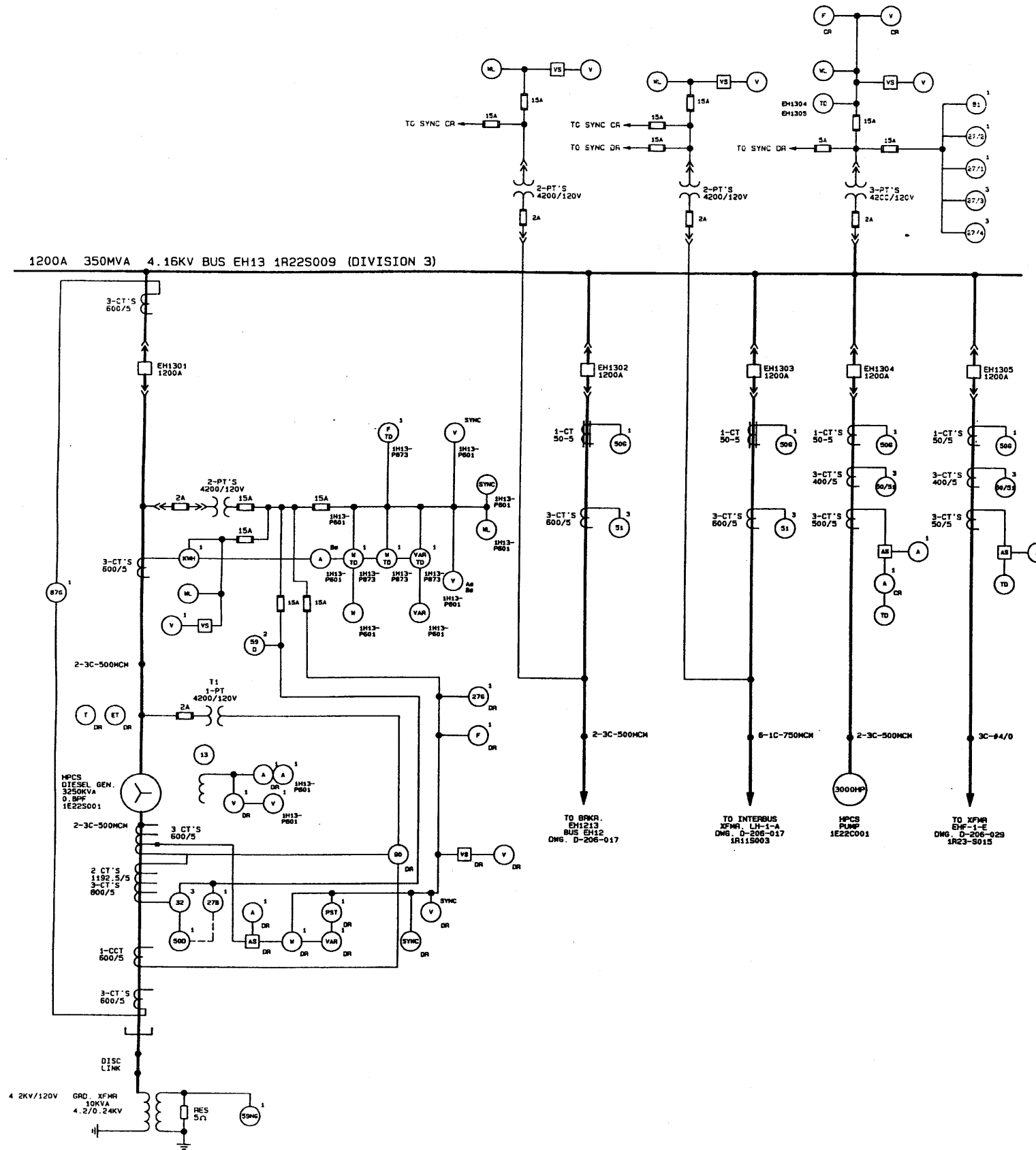
NUCLEAR SAFETY RELATED

(Rev. 16 10/09)

**PERRY NUCLEAR POWER PLANT**

Diesel Logic Diagrams,  
 Division 2

Figure 8.3-6 (Sheet 2 of 2)  
 [Dwg. D-808-317(2)]




NOTES:  
 1. ALL DEVICES ARE LOCATED ON SWGR, UNLESS OTHERWISE INDICATED.  
 2. FOR LEGEND AND ABBREVIATIONS, REFER TO DWG. D-206-012.

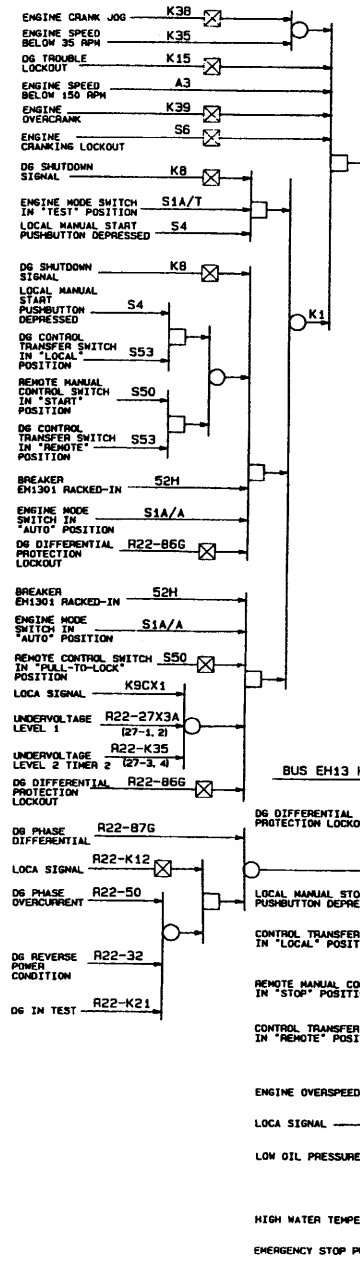
REFERENCE:  
 D-207-039 THRU 041 THREE LINE DIAGRAMS  
 B-208-206 ELEMENTARY WIRING DIAGRAMS

NUCLEAR SAFETY RELATED

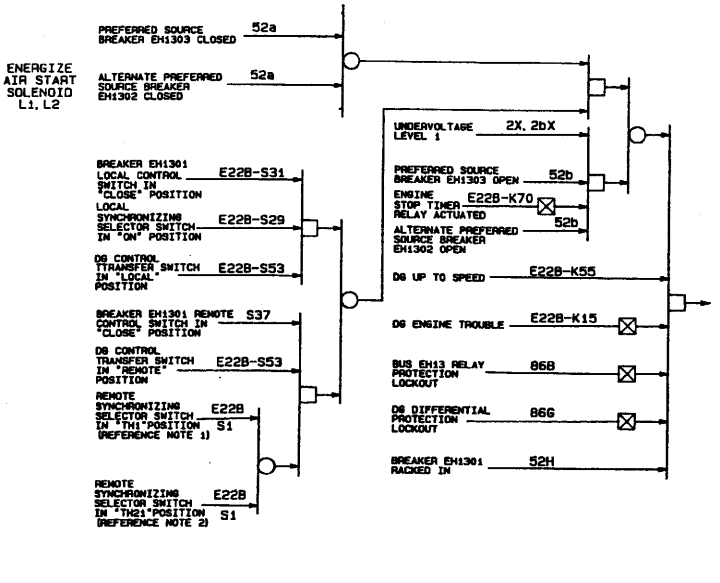
(Rev. 12 1/03)

 <b>PERRY NUCLEAR POWER PLANT</b>
One Line Meter and Relay Diagram, Class 1E, 4.16 kV, Division 3  Figure 8.3-7 (Dwg. D-206-018)

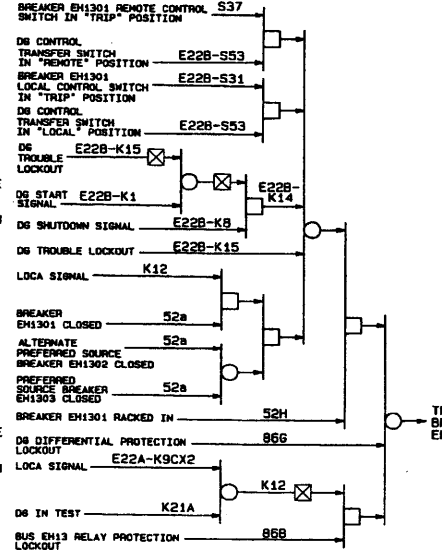
BUS EH13 HPCS DIESEL GENERATOR START LOGIC



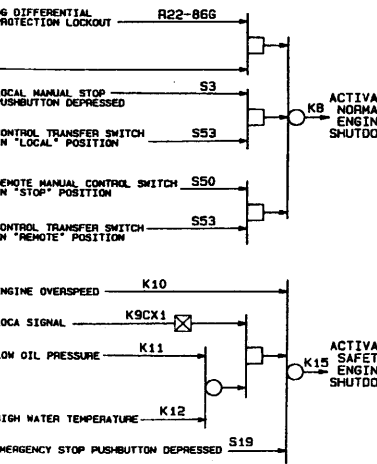
BUS EH13 DIESEL GENERATOR BREAKER EH1301 CLOSE LOGIC



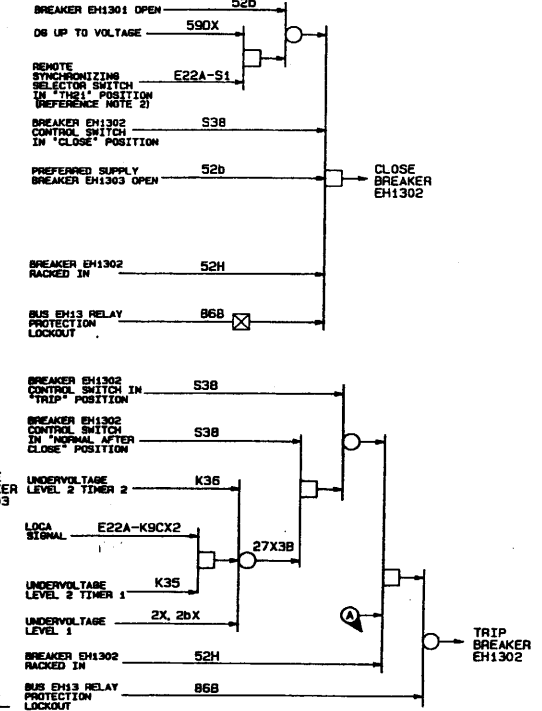
BUS EH13 DIESEL GENERATOR BREAKER EH1301 TRIP LOGIC



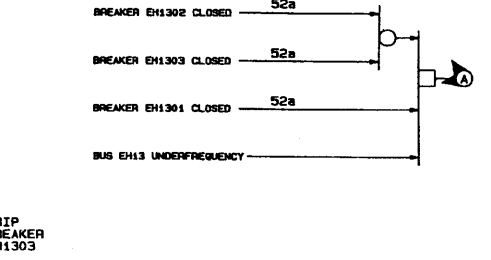
BUS EH13 HPCS DIESEL GENERATOR STOP LOGIC



BUS EH13 ALTERNATE PREFERRED SUPPLY BREAKER EH1302 CLOSE AND TRIP LOGIC



BUS EH13 DIESEL GENERATOR LOAD TEST OVERLOAD PROTECTION



NOTES:  
1. TH1 IS THE CABLE BUS CONNECTING THE UNIT 1 CLASS 1E BUSES TO NORMAL OFF-SITE POWER VIA UNIT 1 INTERBUS TRANSFORMER LH-1-A.  
2. TH2 IS THE CABLE BUS CONNECTING THE UNIT 1 CLASS 1E BUSES TO OFF-SITE POWER VIA UNIT 2 INTERBUS TRANSFORMER LH-2-A.

LEGEND:  
AND  
NOT  
OR

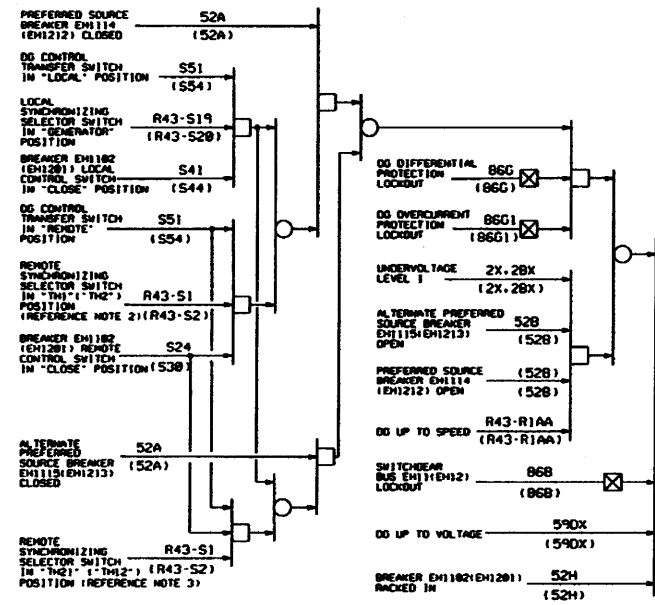
(Rev. 12 1/03)

NUCLEAR SAFETY RELATED

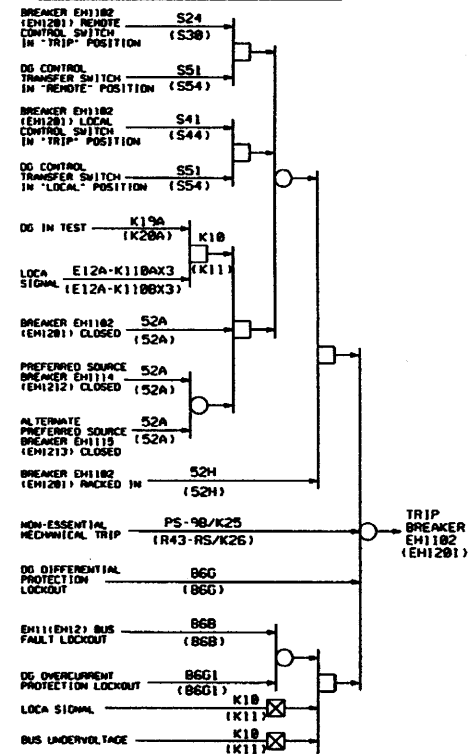
**PERRY NUCLEAR POWER PLANT**

HPCS Diesel, Diesel Breakers, Alternate Preferred Supply Breakers Logic Diagram, (Division 3) Figure 8.3-8 [Dwg. D-808-311(4)]

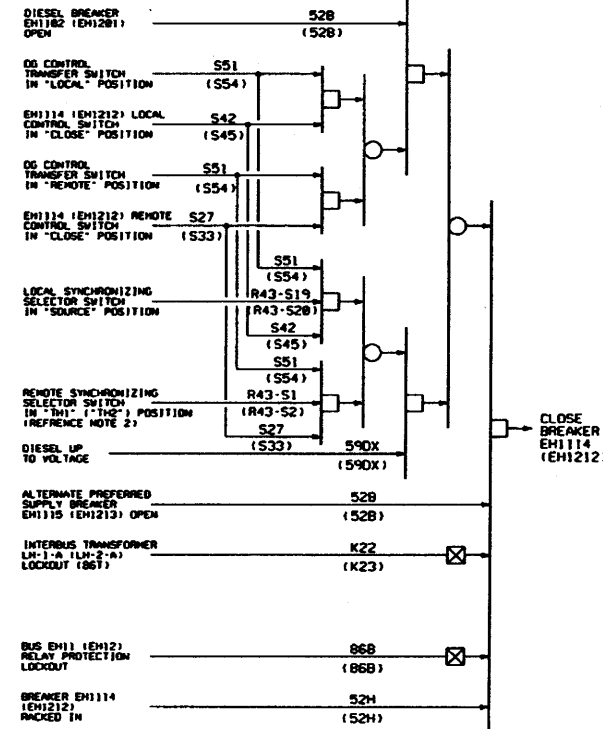
BUS EH11 (EH12) DIESEL GENERATOR BREAKER EH1102 (EH1201) CLOSE LOGIC



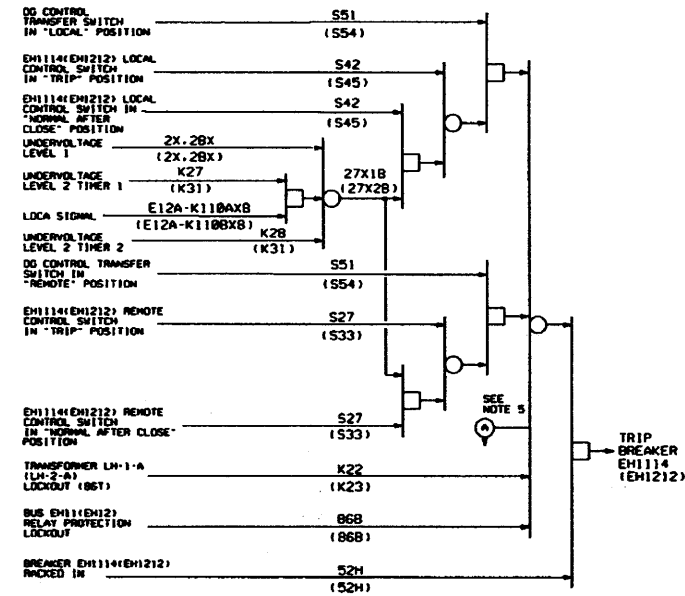
BUS EH11 (EH12) DIESEL GENERATOR BREAKER EH1102 (EH1201) TRIP LOGIC



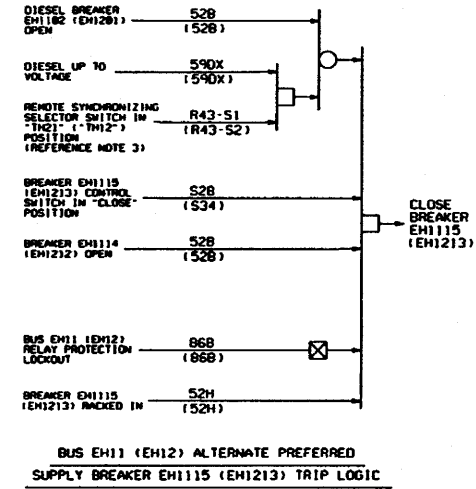
BUS EH11 (EH12) PREFERRED SUPPLY BREAKER EH1114 (EH1212) CLOSE LOGIC



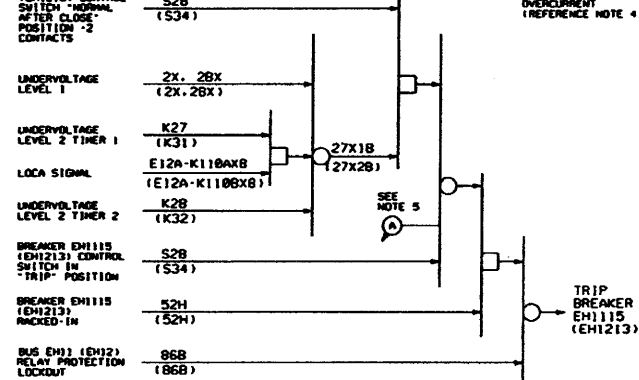
BUS EH11 (EH12) PREFERRED SUPPLY BREAKER EH1114 (EH1212) TRIP LOGIC



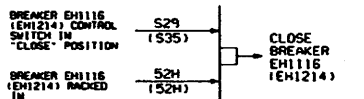
SUPPLY BREAKER EH1115 (EH1213) CLOSE LOGIC



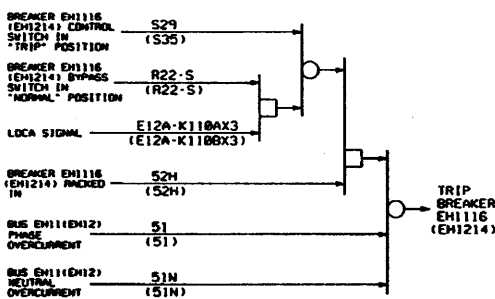
BUS EH11 (EH12) ALTERNATE PREFERRED SUPPLY BREAKER EH1115 (EH1213) TRIP LOGIC



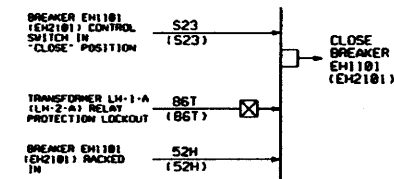
BUS EH11 (EH12) STUB BUS TIE BREAKER EH1116 (EH1214) CLOSE LOGIC



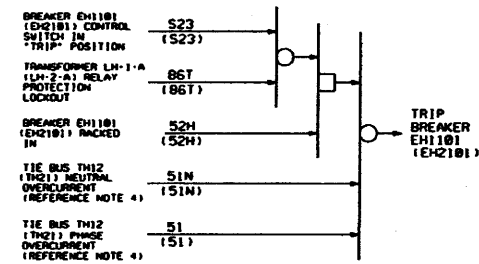
BUS EH11 (EH12) STUB BUS TIE BREAKER EH1116 (EH1214) TRIP LOGIC



4.16 KV UNIT 2 (UNIT 1) TIE BREAKER EH1101 (EH2101) CLOSE LOGIC



4.16 KV UNIT 2 (UNIT 1) TIE BREAKER EH1101 (EH2101) TRIP LOGIC



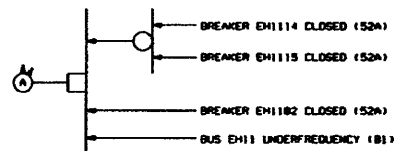
NOTES:

1. BREAKER CLOSE AND TRIP LOGIC FOR REDUNDANT BUS EH12 IS IDENTICAL TO THE LOGIC FOR BUS EH11 AND IS SHOWN IN PARENTHESIS.
2. TH1 IS THE CABLE BUS CONNECTING THE UNIT 1 CLASS 1E 4 KV BUSES TO NORMAL OFF-SITE POWER VIA UNIT 1 INTERBUS TRANSFORMER LH-1-A.
3. TH3 IS THE CABLE BUS CONNECTING THE UNIT 1 CLASS 1E 4 KV BUSES TO OFF-SITE POWER VIA UNIT 2 INTERBUS TRANSFORMER LH-2-A.
4. TH2 IS THE CABLE BUS CONNECTING THE UNIT 2 CLASS 1E 4 KV BUSES TO OFF-SITE POWER VIA UNIT 1 INTERBUS TRANSFORMER LH-1-A.
5. LOAD TEST OVERLOAD PROTECTION FOR BUS EH11 ONLY.


LEGEND:

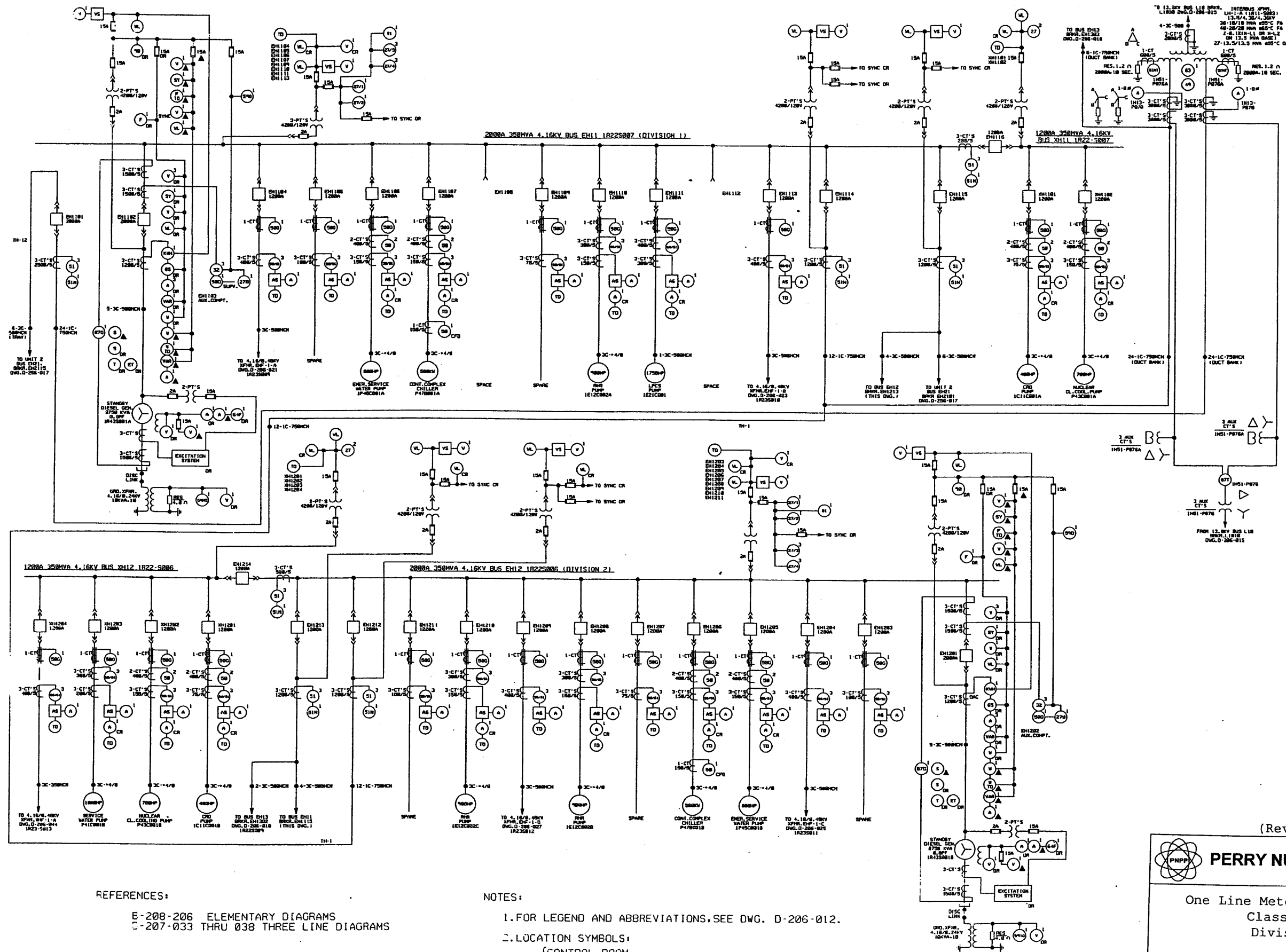
- AND
- ⊗ NOT
- OR

BUS EH11 DIESEL GENERATOR LOAD TEST OVERLOAD PROTECTION



(Rev. 15 10/07)


**PERRY NUCLEAR POWER PLANT**  
 Diesel Breaker, Preferred,  
 Alternate Preferred and  
 Stub Bus Logic Diagram,  
 Division 1, (Division 2)  
 Figure 8.3-9  
 [Dwg. D-808-317(3)]



REFERENCES:  
 E-208-206 ELEMENTARY DIAGRAMS  
 D-207-033 THRU 038 THREE LINE DIAGRAMS

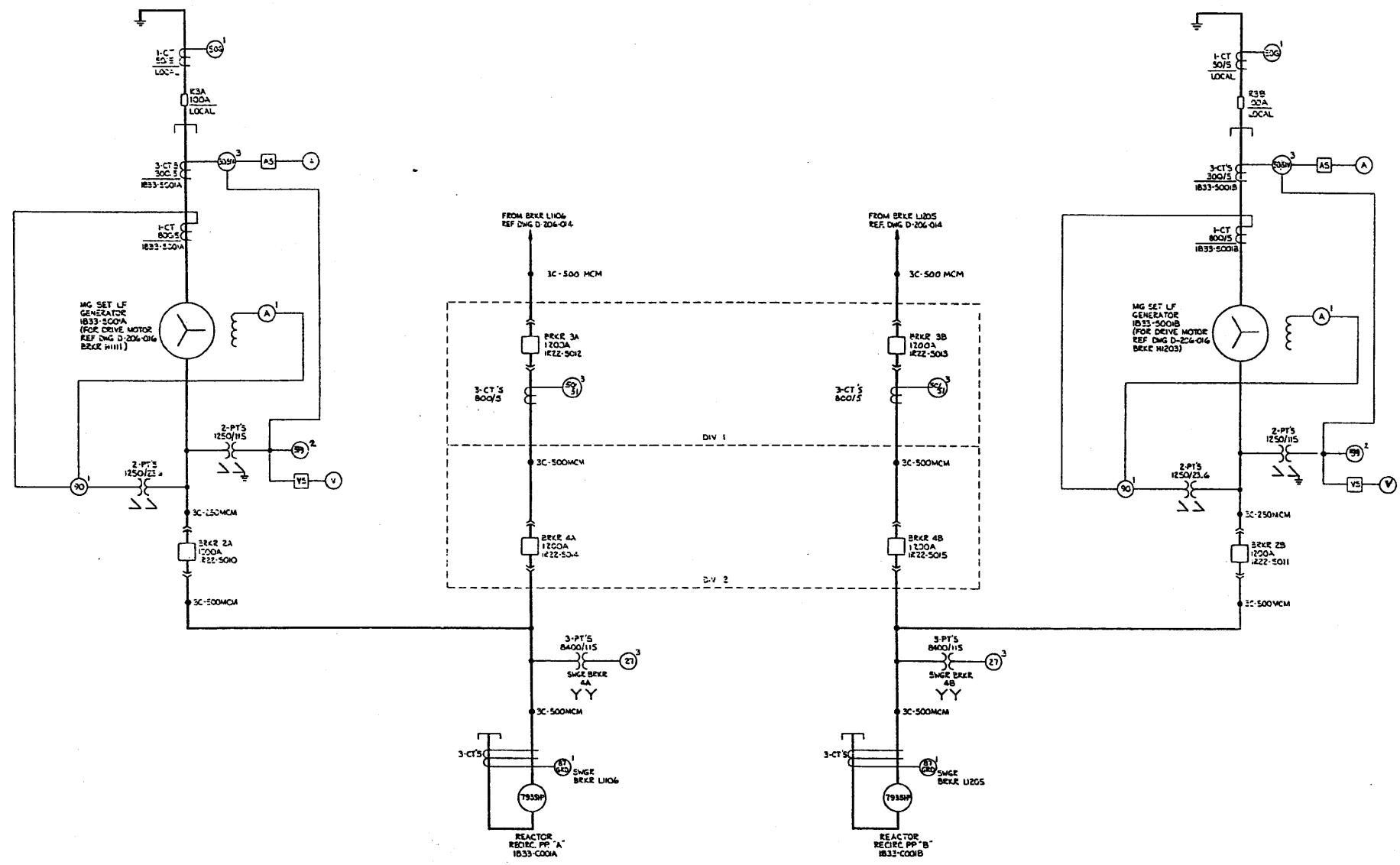
NOTES:  
 1. FOR LEGEND AND ABBREVIATIONS, SEE DWG. D-206-012.  
 2. LOCATION SYMBOLS:  
 △ CONTROL ROOM  
 PNL. 1H13-P877

(Rev. 12 1/03)

**PERRY NUCLEAR POWER PLANT**

One Line Meter and Relay Diagram,  
 Class 1E, 4.16 kV,  
 Divisions 1 and 2

Figure 8.3-10  
 (Dwg. D-206-017)



- NOTES:
1. FOR LEGEND AND ABBREVIATIONS, SEE DWG. D-206-012.
  2. DEVICES ARE LOCATED IN PANEL 1833-P001A FOR RECIRCULATION PUMP "A" AND PANEL 1833-P001B FOR RECIRCULATION PUMP "B", UNLESS OTHERWISE INDICATED.
  3. EQUIPMENT IS NON-DIVISIONAL, UNLESS INDICATED OTHERWISE.
  4. GROUND SENSORS FOR MOTOR DIFFERENTIAL PROTECTION ARE LOCATED IN MOTOR TERMINAL BOX.

- REFERENCES:
- D-206-014 ONE LINE DIAGRAM
  - D-206-016 ONE LINE DIAGRAM
  - D-206-015 ELEMENTARY DIAGRAM

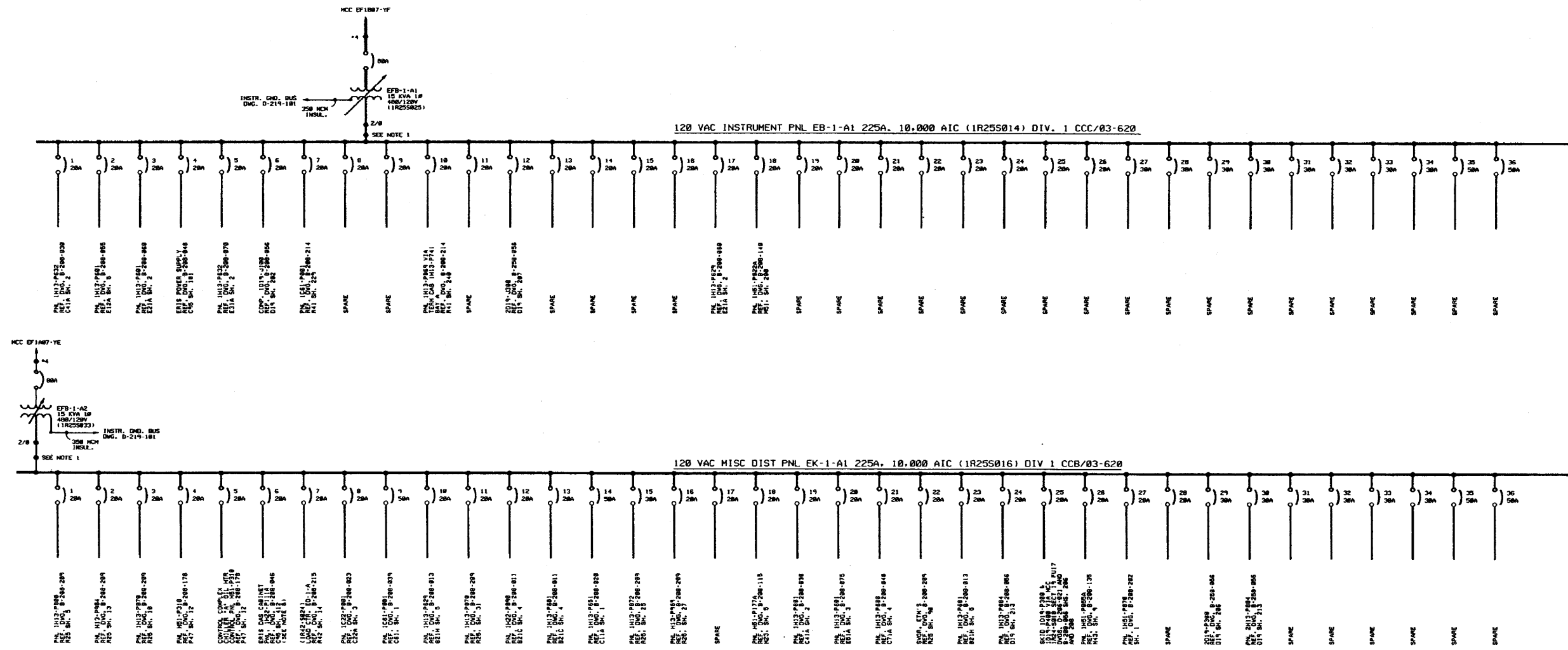
(Rev. 12 1/03)

**PERRY NUCLEAR POWER PLANT**

One Line Meter and Relay Diagram,  
Recirculation Pump Motor Feeders,  
Unit 1

Figure 8.3-11  
(Dwg. D-206-019)





**REFERENCES**  
 REF. DWG. D-206-012 FOR INTERPRETATION OF PANEL BUS NUMBERS

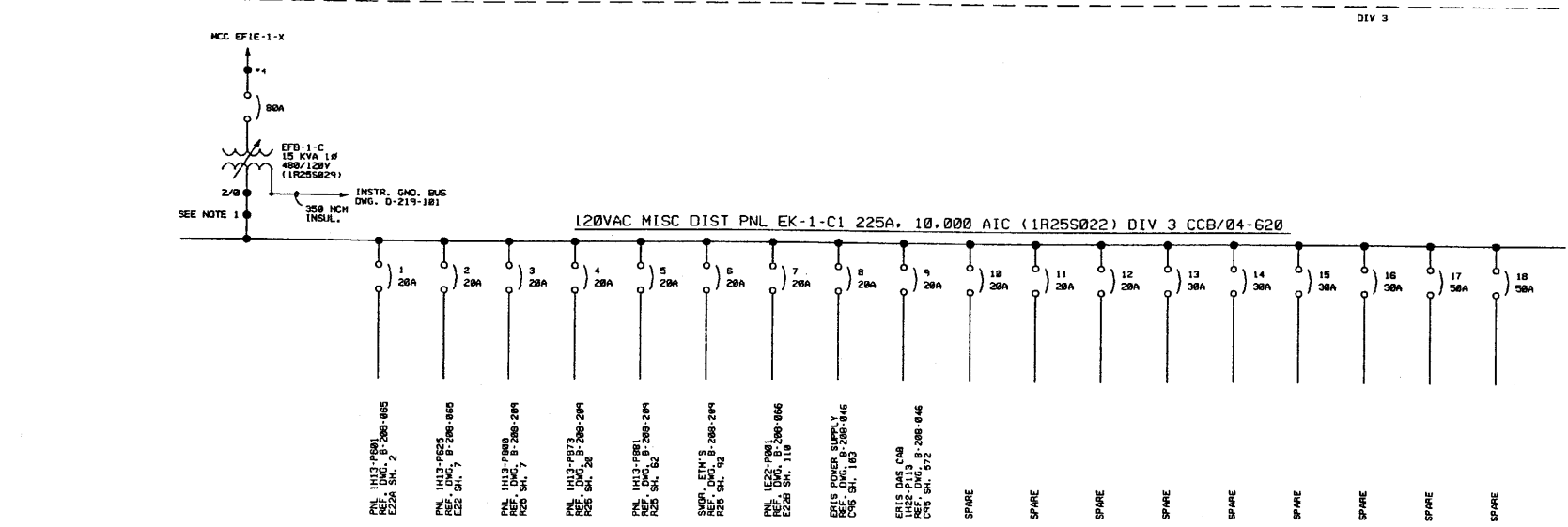
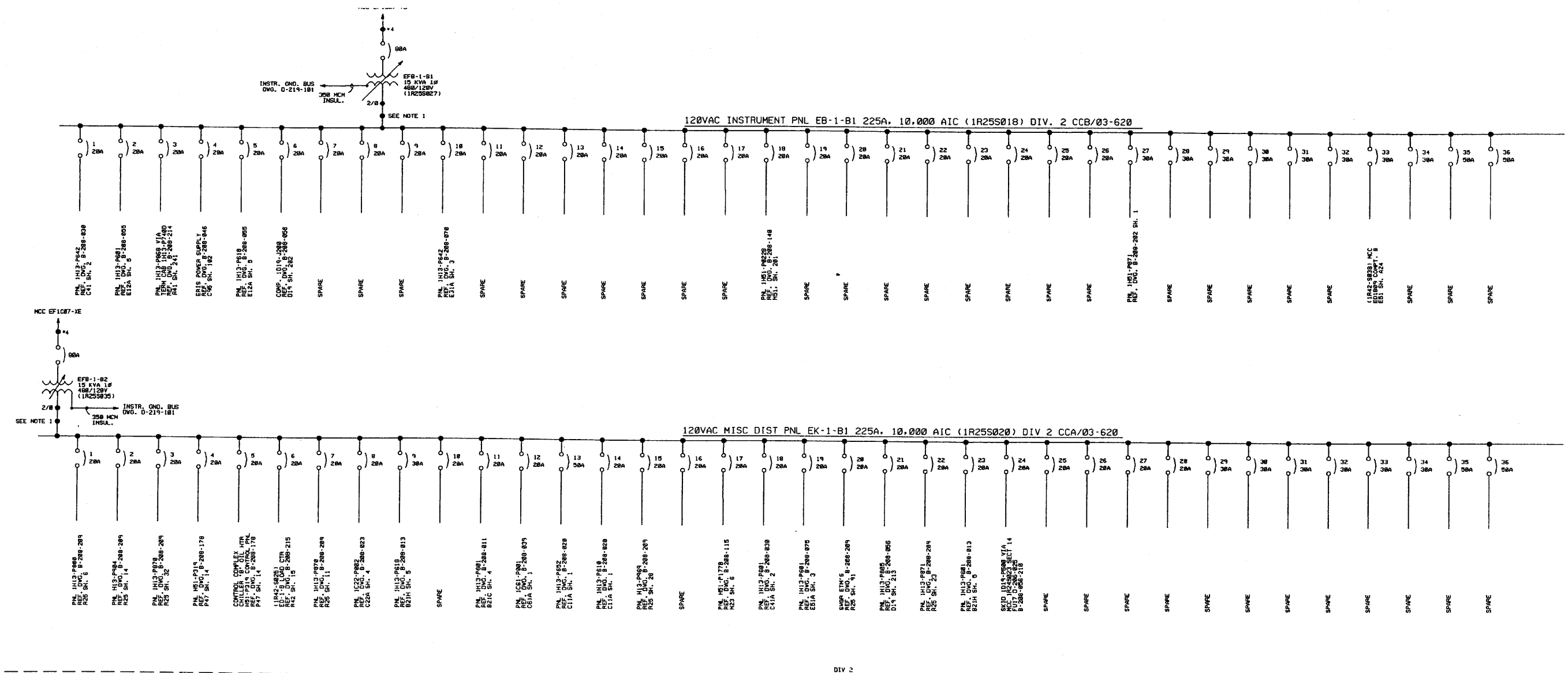
- NOTES**
- EACH DISTRIBUTION PANEL IS MOUNTED INSIDE THEIR RESPECTIVE MCC. EACH TRANSFORMER IS MOUNTED OUTSIDE THEIR RESPECTIVE MCC.
  - NEUTRALS GROUNDED AT TRANSFORMER SECONDARIES.
  - ALL STRUCTURES GROUNDED TO PLANT GND GRID.
  - FEEDEER CABLE SIZES:
- | BUS SIZE | WIRE SIZE IF RUN ENTIRELY IN CONDUIT | WIRE SIZE IF RUN ENTIRELY OR PARTIALLY IN TRAY 2" DP. | WIRE SIZE IF RUN ENTIRELY OR PARTIALLY IN TRAY 3" DP. |
|----------|--------------------------------------|---|---|
| 20A      | #12                                  | #10   | #6  |
| 30A      | #10                                  | #8  | #4  |
| 50A      | #8                                   | #6  | #2  |
- IF WIRE SIZE IS NOT AVAILABLE USE NEXT LARGER SIZE.
  - THE CABLE FOR CIRCUIT BREAKER NO. 6 DOES NOT MEET THE "FEEDER CABLE SIZE" CRITERIA OF NOTE 4. THIS CABLE IS USED BY THE ERIS COMPUTER TO MONITOR THE BUS VOLTAGE.

(Rev. 12 1/03)

**PERRY NUCLEAR POWER PLANT**


One Line Diagram, Class 1E,  
120 Volt AC, Division 1

Figure 8.3-12  
(Dwg. D-206-053)



- REFERENCES**  
REF. DWG. D-206-012 FOR INTERPRETATION OF PANEL BUS NUMBERS
- NOTES**
1. EACH DISTRIBUTION PANEL IS MOUNTED INSIDE THEIR RESPECTIVE MCC. EACH TRANSFORMER IS MOUNTED OUTSIDE THEIR RESPECTIVE MCC.
  2. NEUTRAL GROUNDED AT TRANSFORMER SECONDARIES.
  3. ALL STRUCTURES GROUNDED TO PLANT GND GRID.
  4. FOR FEEDER CABLE SIZES REFER TO DWG. D-206-053 NOTE 4.
  5. IF WIRE SIZE IS NOT AVAILABLE USE NEXT LARGER SIZE.

(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**

One Line Diagram, Class 1E,  
120 Volt AC, Divisions 2 and 3

Figure 8.3-13  
(Dwg. D-206-054)

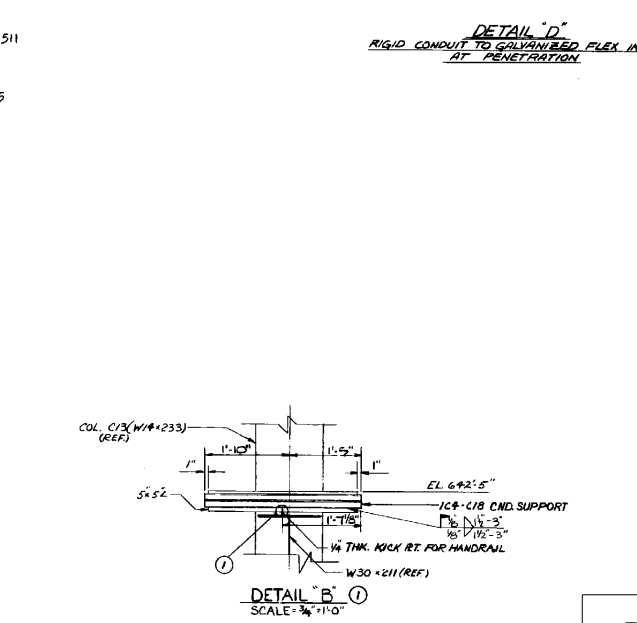
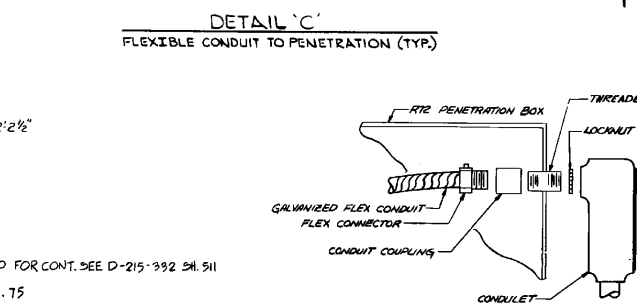
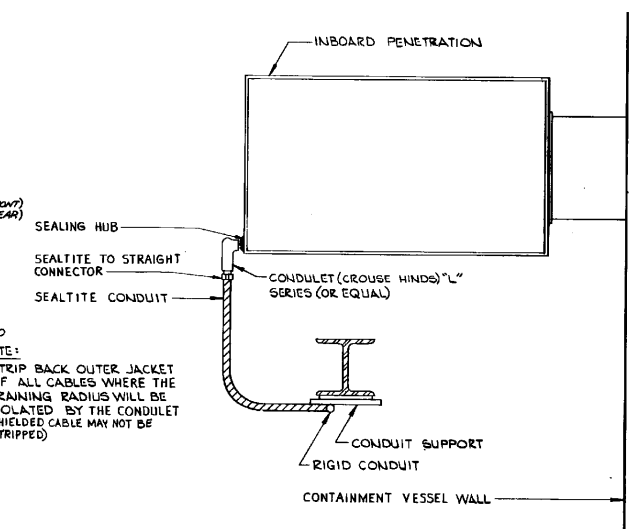
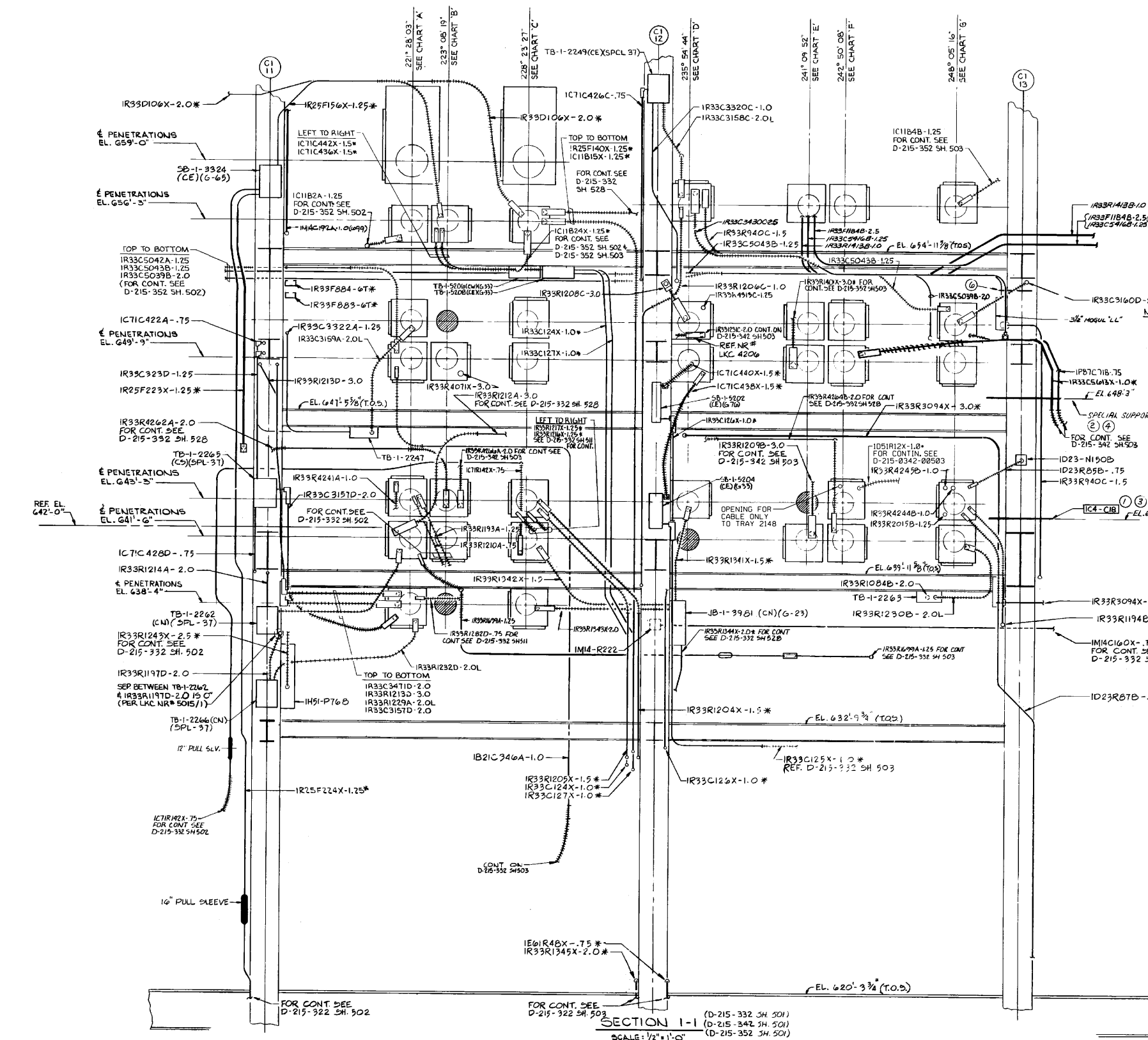


CHART 'A' TOP TO BOT.	CHART 'B' TOP TO BOT.	CHART 'C' TOP TO BOT.	CHART 'D' TOP TO BOT.	CHART 'E' TOP TO BOT.	CHART 'F' TOP TO BOT.	CHART 'G' TOP TO BOT.
ERB5008 IR72-5001	ERB5002 IR72-5029	ERB5010 IR72-5002	ERB5004 IR72-5011	ERB5005 IR72-5032	ERB5006 IR72-5006	ERB5007 IR72-5004
ERB5001 IR72-5003	ERB4019 SPARE	ERB5003 IR72-5005	ERB4021 IR72-5025	ERB4022 IR72-5038	ERB4023 IR72-5014	ERB4024 IR72-5009
ERB4018 IR72-5007	ERB4010 IR72-5031	ERB4020 IR72-5012	ERB4012 IR72-5033	ERB4013 IR72-5036	ERB4014 IR72-5015	ERB4015 IR72-5010
ERB4009 IR72-5008	ERB4002 IR72-5030	ERB4011 IR72-5018	ERB4004 IR72-5024	ERB4005 SPARE	ERB4006 IR72-5022	ERB4007 IR72-5020
ERB4001 IR72-5016	ERB3004 IR72-5028	ERB4003 IR72-5018	EKB3006 SPARE	ERB3007 IR72-5021	ERB3008 IR72-5035	ERB3009 IR72-5023
ERB3003 IR72-5017	ERB3002 SPARE	ERB3005 IR72-5019				
ERB3001 IR72-5026		ERB3010 IR72-5027				

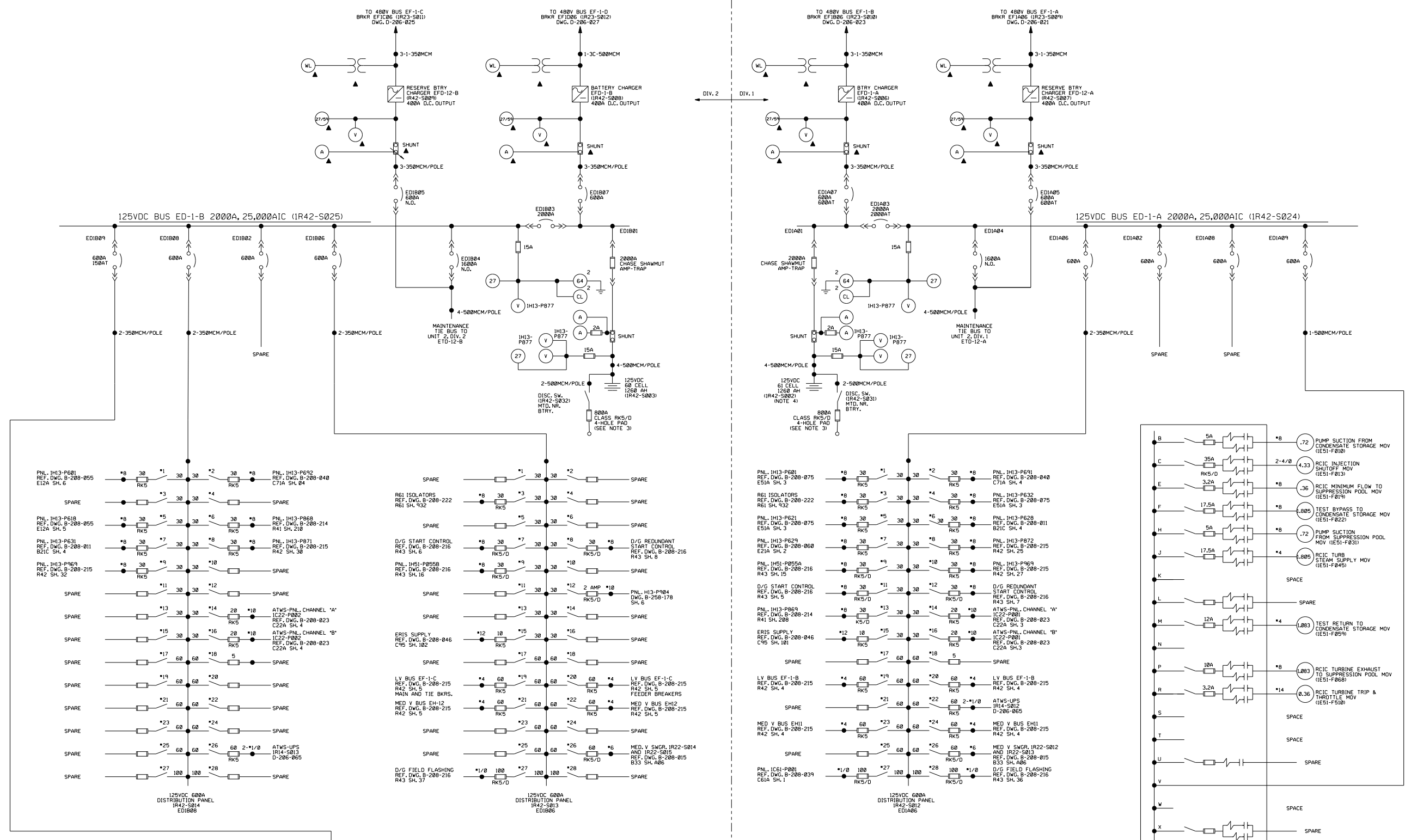
- VARIANCES**
- ATTACH B52B STRUT TO CONDUIT SUPPORT IC4-C18 PER DETAIL 'B'. STRUT IS TO EXTEND 1" MAX. PAST THE EDGE OF IC4-C18 ON BOTH SIDES.
  - ATTACH AN ELECTRICAL CONDUIT SUPPORT IDENTICAL TO IC4-C18 TO COLUMN C1-13 (W44x233) AND ATTACH B52B STRUT THE ENTIRE LENGTH OF SUPPORT PLUS 1" MAX. PAST BOTH ENDS.
  - ALLOW CND. IR33R940C-1.5 AND IR33R3094X-3.0 TO ATTACH TO IC4-C18.
  - ALLOW CND. N<sup>5</sup> IR33R940C-1.5, IPB7C718-.75 & IR33C5613X-1.0 TO ATTACH TO SUPPORT (REF. VARIANCE 2).
  - SPARE.
  - ALLOW DETAIL 'D' THAT SUPPORTS CND. IR33R940C-1.5 TO ATTACH TO COLUMN.
- ⑦ ALLOW IR33R940C-1.5 TO BE MOUNTED ON STRUT TO COL. C1-11, AS SHOWN ON SEC. 3-3 (D-215-667 SH 502), UTILIZING 3/8" STUD NUTS.

(REV. 20 10/2017)

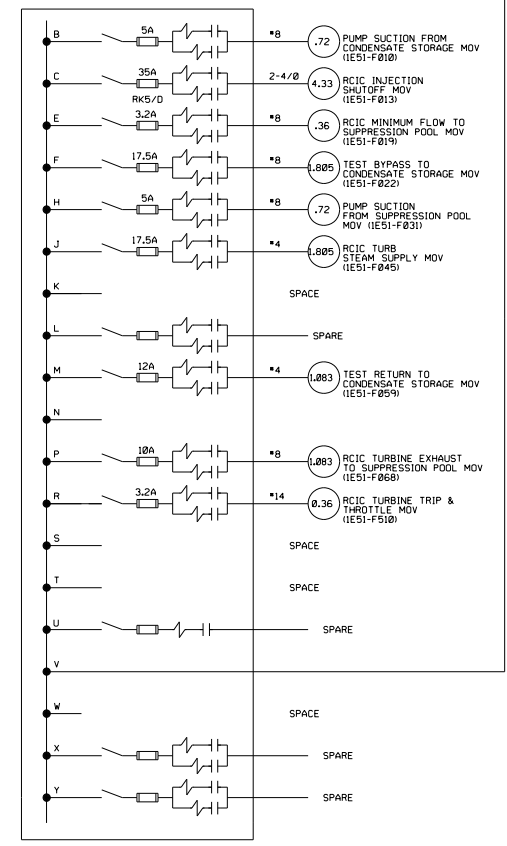
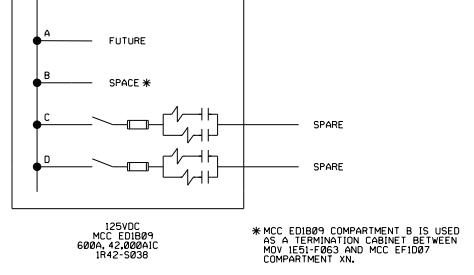
**PERRY NUCLEAR POWER PLANT**  
 10 CENTER RD., PERRY, OHIO 44081

CONTAINMENT VESSEL PENETRATION  
 LOCATIONS PROTECTIVE ENCLOSURE  
 SPATIAL LAYOUT VIEWED FROM INSIDE  
 UNIT 1 CONTAINMENT VESSEL  
 FIGURE 8.3-19  
 (DWG. D-215-0667-00501)

- NOTES:
- FOR LEGEND, NOTES, REFERENCES AND STANDARD DETAILS, SEE D-215-801.
  - DWG. D-215-667 SH. 501 PER GAI DWG. D-215-667 REV. H.
  - THIS DWG. TO BE WORKED WITH DWGS. D-215-332 SHT. 9 502, 503, D-215-342 SHT. 5 502, 503, D-215-352 SHT. 5 502 AND 503.



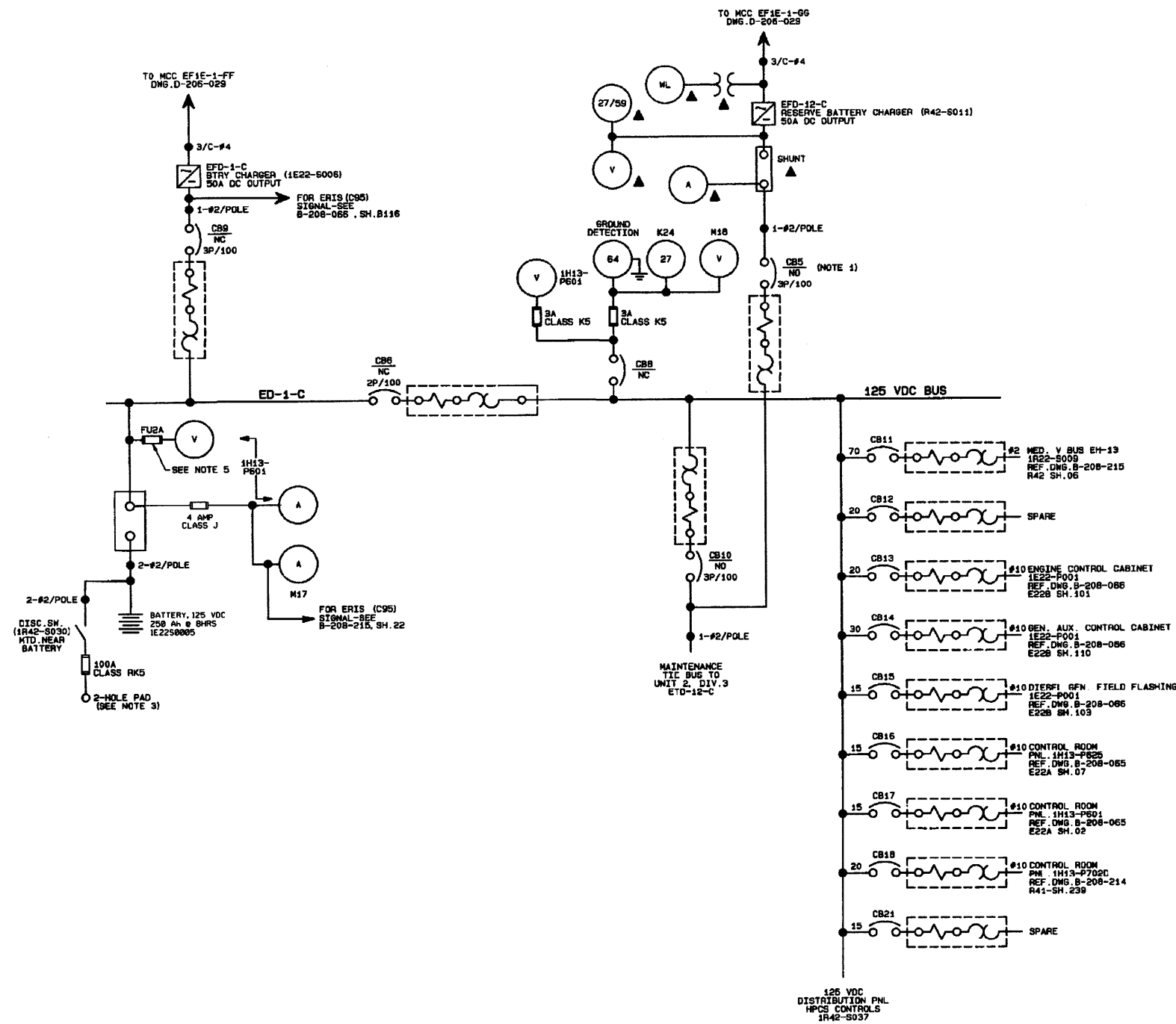
- NOTES:**
- FOR LEGEND AND ABBREVIATIONS, SEE DWG. D-206-012.
  - DEVICES LOCATED IN SWGR, UNLESS OTHERWISE INDICATED. ▲ INDICATES DEVICES LOCATED IN BATTERY CHARGER.
  - REQUIRED FOR CONNECTION OF 2-500MCM CABLES FROM PORTABLE BATTERY CAPACITY TEST RIG.
  - DIVISION 1 BATTERY HAS ONE EXTRA 20N15 CELL JAR WHICH CONTAINS ONE ACTIVE CELL AND ONE CELL FILLED WITH AN INERT/INACTIVE MATERIAL.



(REV. 20 10/2017)

**PERRY NUCLEAR POWER PLANT**  
10 CENTER RD., PERRY, OHIO 44081

ONE LINE METER AND RELAY DIAGRAM,  
CLASS 1E, 125 VOLT DC, DIVISION 1 & 2  
FIGURE 8.3-21  
(DWG. D-206-0051-00000)



NOTES:

1. CB5 BREAKER IS SUPPLIED ON GENERATOR UNIT NO. 1 ONLY.
2. FOR LEGEND AND ABBREVIATIONS, SEE DWG. D-206-012.
3. REQUIRED FOR CONNECTION OF 500MCM CABLE FROM PORTABLE BATTERY CAPACITY TEST RIG.
4. DEVICES LOCATED IN SWBR UNLESS OTHERWISE INDICATED  
A. ▲ INDICATES DEVICES LOCATED IN BATTERY CHARGER
5. GOULD SHAWMUT-FUSE MODEL OTM-2 OR EQUIVALENT.

REFERENCES:

- B-211-208 SH. 1 BLOCK DIAGRAM  
B-211-065 SH. 2 & 13 BLOCK DIAGRAM  
B-211-066 SH. 6 & 13 BLOCK DIAGRAM

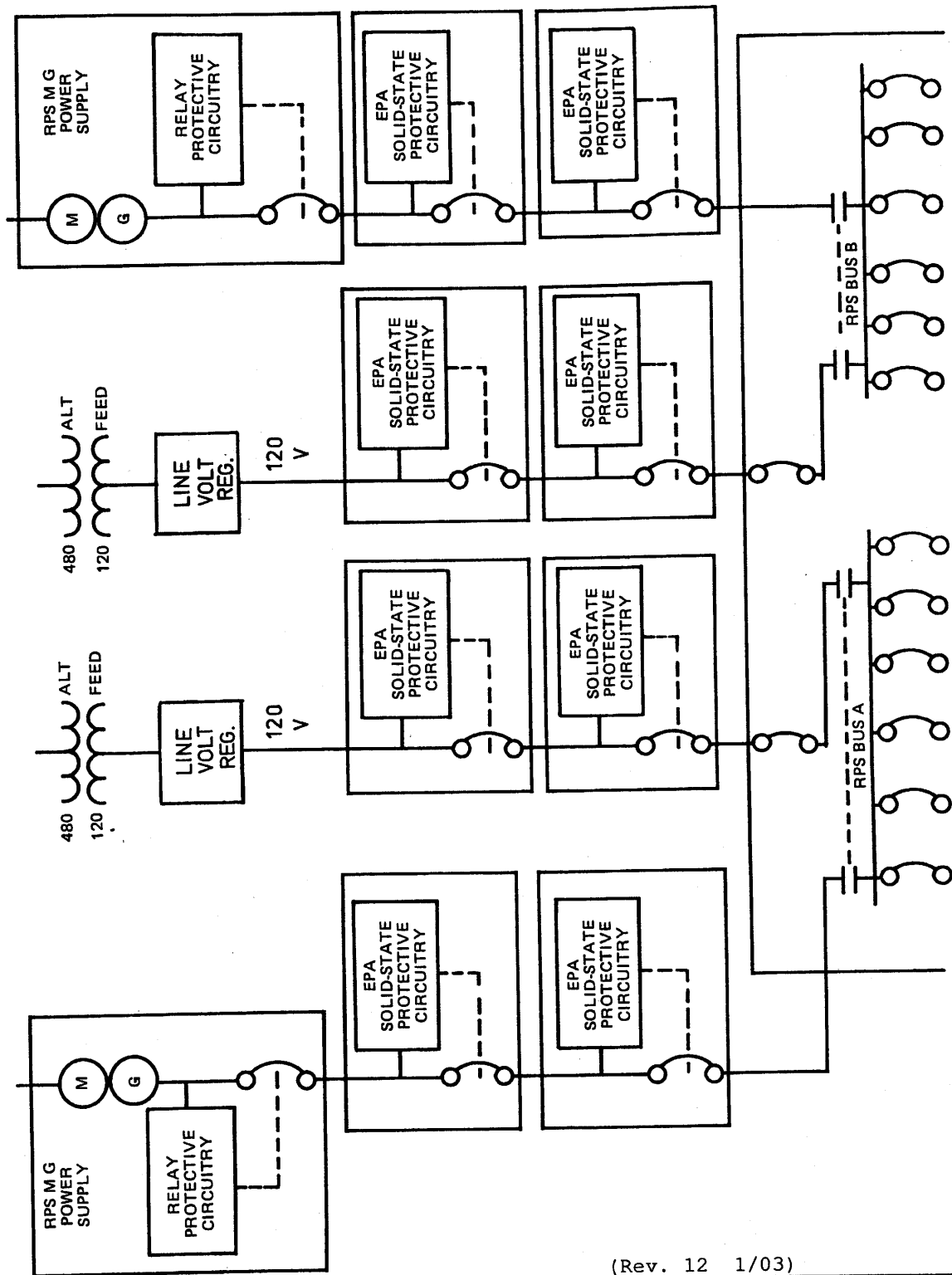
REFERENCES:

- D-01381-22711CE STEWART & STEVENSON SERVICES

(REV. 19 10/2015)

PERRY NUCLEAR POWER PLANT  
10 CENTER RD., PERRY, OHIO 44081

ONE LINE METER AND RELAY DIAGRAM,  
CLASS 1E, 125 VOLT DC, DIVISION 3  
FIGURE 8.3-22  
(DWG. D-206-0050-00000)



(Rev. 12 1/03)



Block Diagram - RPS Protective Circuit Showing EPA Assemblies

Figure 8.3-23