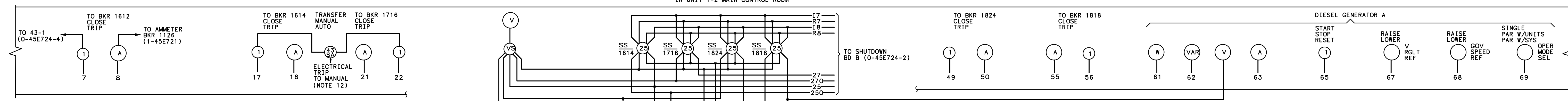


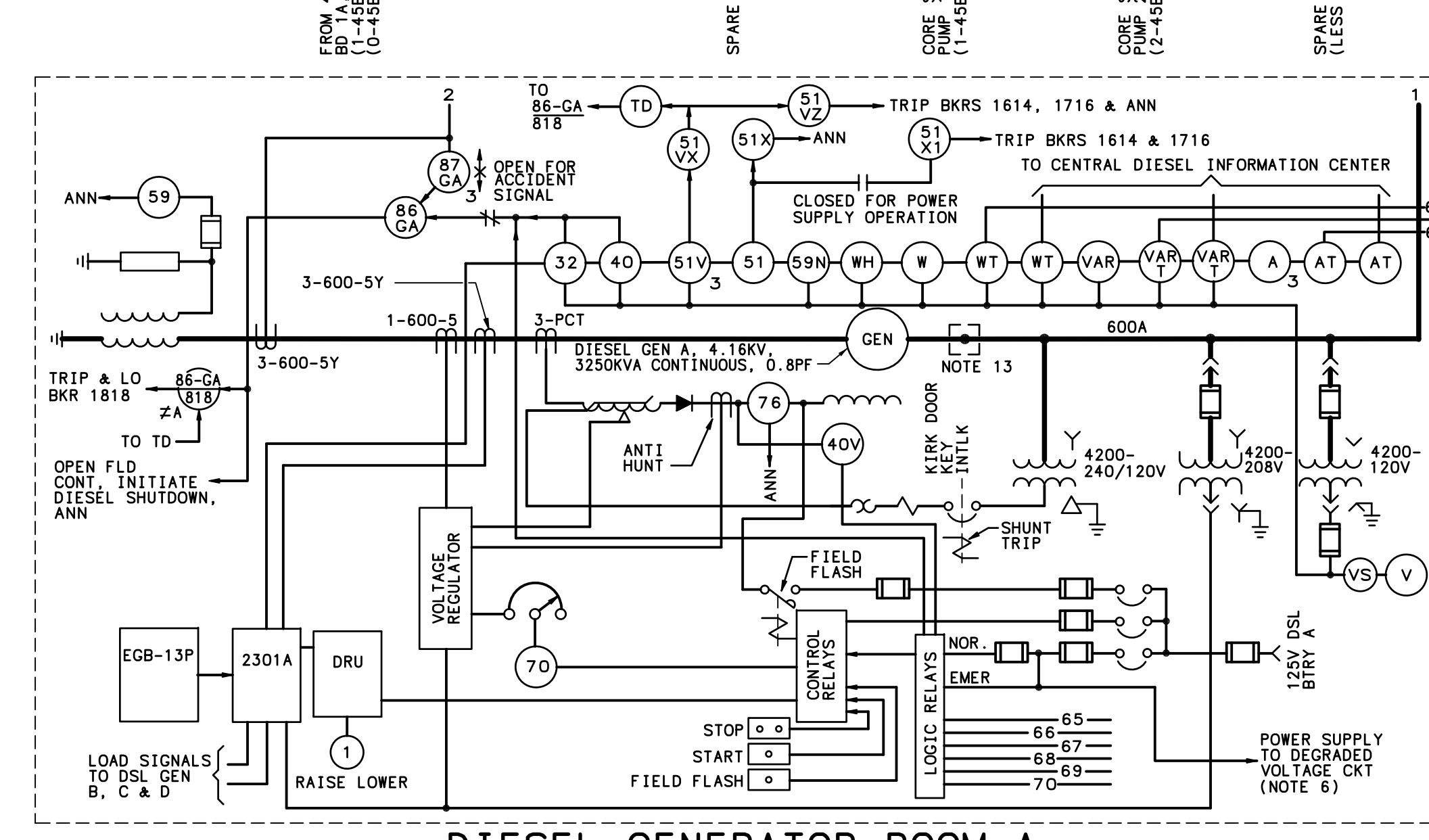
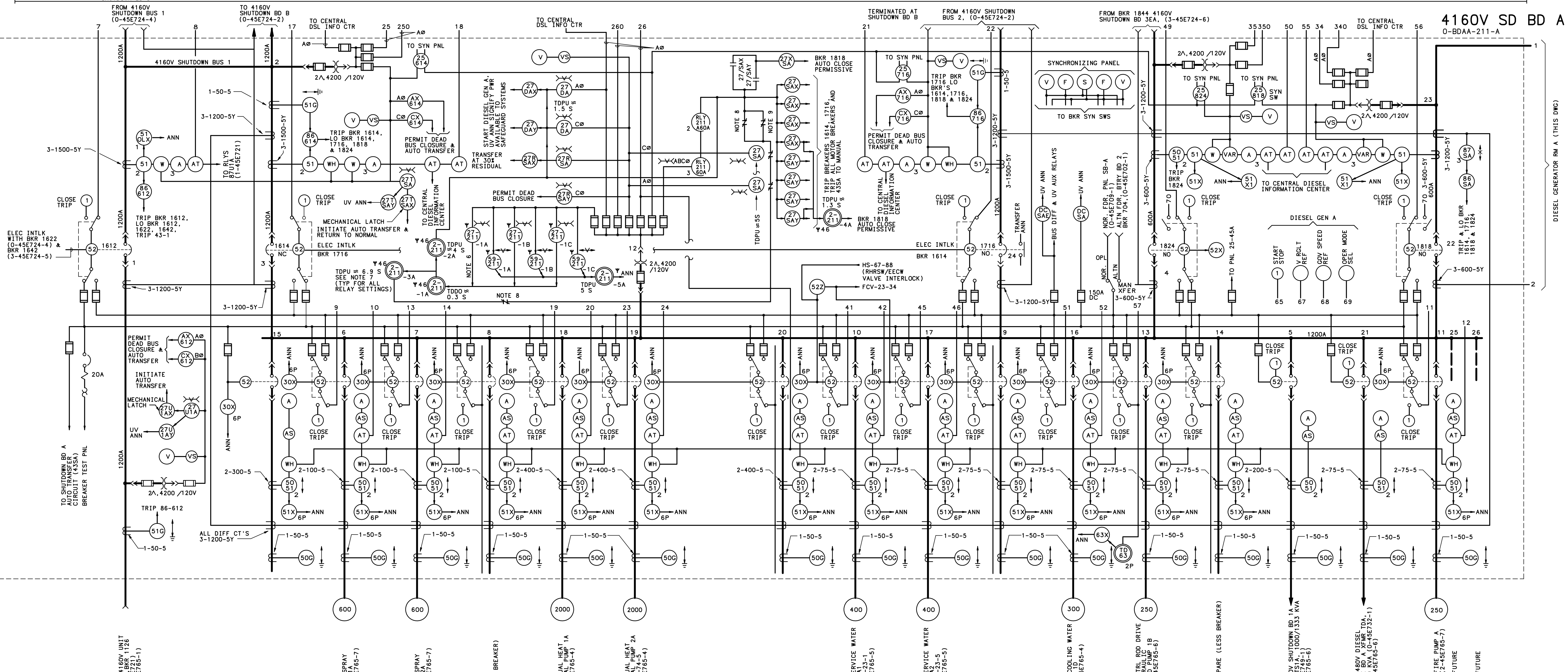
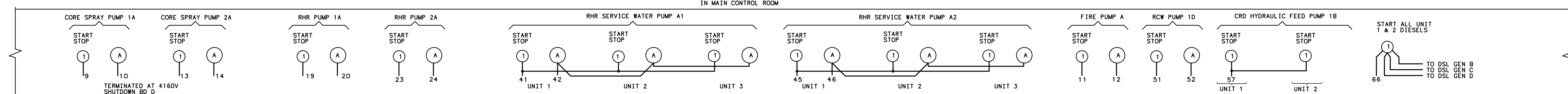




ELECTRICAL CONTROL BOARD



## UNIT CONTROL BOARDS



OP=1 WHEN 4KV SHUTDOWN BOARD A IS ALIGNED TO ITS  
ALTERNATE 230V DC CONTROL POWER SOURCE (250V DC,  
T150V DC, BATTERY BOARD 2) AND THE SHUTDOWN BOARD  
IN THE LOSS OF DC A AND 30, THEREFORE, THE FOLLOWING  
OPERATING CONDITIONS APPLY:

1. A SINGLE FAILURE COULD ADVERSELY IMPACT BOTH  
DIVISIONS IN UNIT 2, UNLESS THE NORMAL SUPPLY  
T150V DC SHUTDOWN BOARD HAS BEEN OPERED INOPERABLE  
AND THE PLANT IS ALREADY IN LCO 3.8.4. UNIT 2  
WILL BE REQUIRED TO SHUT DOWN THE 4KV SHUTDOWN BOARD  
SUPPLY TO 4KV SHUTDOWN BOARD A (250V DC  
DISTRIBUTION PANEL SHUTDOWN BATTERY-A).

2. A SINGLE FAILURE COULD RESULT IN THE LOSS OF  
OPERATING CONDITIONS, THERE ARE NO RESTRICTIONS  
ON 1 AND 3 AND 4 BASED ON THE PLANT CONDITIONS.

3. A SINGLE FAILURE COULD RESULT IN THE LOSS OF  
SBS1 TRAINS A AND C, INSTEAD OF JUST ONE SBS1  
TRAIN C. THE SHUTDOWN BOARD 2 IS NOT INOPERABLE  
UNITS 1, 2 AND 3 SHALL SHUT SBS1 TRAIN A OR C  
BASED ON THE PLANT OPERATING CONDITIONS, 3.8.4.3 BASED ON  
PLANT OPERATING CONDITIONS.

4. A SINGLE FAILURE COULD RESULT IN THE LOSS OF  
TWO RHRS/ECM SWING PUMPS THAT COULD BE  
OPERATED FOR EACH OF THE RHRS/ECM SWING PUMPS  
(IF THE BOARDS WERE IN A NORMAL ALIGNMENT). IF  
THE LOSS OF RHRS/ECM SWING PUMPS IS NOT INOPERABLE  
FOR EACH, UNITS 1, 2 AND 3 SHALL CONSIDER ONLY ONE  
RHRS/ECM SWING PUMPS AT A LOSS. UNITS 1, 2 AND 3  
SHALL BE TO BE CONSIDERED INOPERABLE AND ENTER  
LCO 3.8.4.3 AS REQUIRED FOR THE PLANT CONDITIONS.

5. A SINGLE FAILURE COULD RESULT IN THE LOSS OF  
THREE PUMPS NORMALLY ALIGNED FOR RHRSW INSTEAD  
OF TWO. TWO RHRSW PUMPS IF THE BOARDS WERE IN A  
NORMAL ALIGNMENT. UNITS 1, 2 AND 3 SHALL  
CONSIDER EITHER THE A1 AND A2, OR THE D1  
AND D2, OR THE E1 AND E2, OR THE 3.7.1 AND 3.7.2  
AS REQUIRED FOR THE PLANT CONDITIONS.

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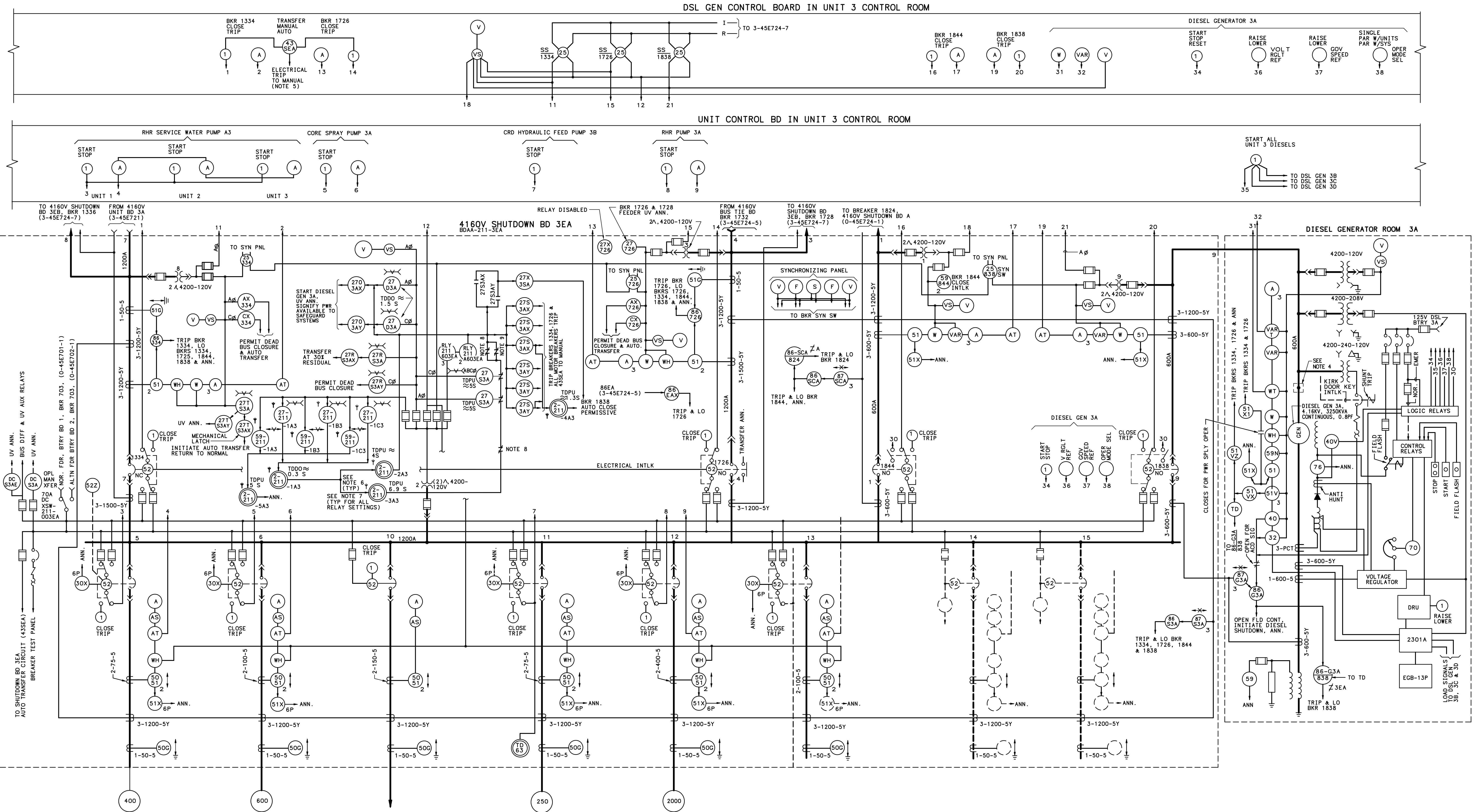
## AMENDMENT 29

POWERHOUSE UNITS 1-3	
BROWNS FERRY NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT	

4160V SHUTDOWN BOARD A  
SINGLE LINE

FIGURE 8.5-4a

SYMBOL:  
 Z A(B,C,D) COMPONENTS ON OTHER 4160V SHUTDOWN BOARD COMPANION DRAWINGS:  
 0-45E724-2, -3, -4  
 3-45E724-5, -6, -7, -8, -9



- NOTES:
- FOR GENERAL NOTES, SYMBOLS AND REFERENCE DRAWINGS SEE 0-45E724-1.
  - UNITS ON DRAWING ARE FOR REFERENCE ONLY AND ARE ABBREVIATED TO MEET SPACE CONSTRAINTS. REFER TO BEL FOR COMPLETE UNITS. ALL UNITS ARE PREFIXED "BKR-" UNLESS OTHERWISE NOTED.
  - REFERENCE CALCULATION NO-00999-940013.
  - PLANNED CONNECTION POINT FOR FLEX GENERATOR. CABLES SHALL BE LIFTED OFF THE EDC LEADS AND LUGGED DIRECTLY TO FLEX GENERATOR CABLES.
  - MAINTAIN 43SEA IN MANUAL POSITION.

OPL-WHEN 4KV SHUTDOWN BOARD 3EA IS ALIGNED TO ITS ALTERNATE 250V DC CONTROL POWER SOURCE (250V DC BATTERY BOARD 2), A SINGLE FAILURE COULD RESULT IN THE LOSS OF DC 3A AND 3D. THEREFORE, THE FOLLOWING REQUIREMENTS APPLY (NOTE 3):

- A SINGLE FAILURE COULD ADVERSELY IMPACT BOTH ECCS DIVISIONS IN UNIT 3, UNLESS THE NORMAL SUPPLY 250V DC SUBSYSTEM HAS BEEN DECLARED INOPERABLE AND THE PLANT IS ALREADY IN LCO 3.8.4. UNIT 3 SHALL CONSIDER THE NORMAL 250V DC CONTROL POWER SUPPLY TO 4KV SHUTDOWN BOARD 3EA (250V DC BATTERY BOARD-1) INOPERABLE AND ENTER LCO 3.8.7 IF OPERATING IN MODES 1, 2 OR 3. THERE ARE NO RESTRICTIONS ON UNITS 1 AND 2 OPERATION EXCEPT AS NOTED BELOW.
- A SINGLE FAILURE COULD RESULT IN THE LOSS OF ONE ECCW PUMP AND ONE RHR/EECW SWING PUMP THAT COULD BE ALIGNED FOR ECCW (INSTEAD OF JUST ONE ECCW PUMP IF THE BOARD WERE IN A NORMAL ALIGNMENT). IF THE D1 PUMP IS ALIGNED FOR ECCW, UNITS 1, 2 AND 3 SHALL CONSIDER EITHER THE A3 OR THE D1 PUMP INOPERABLE AND ENTER LCO 3.7.2 AS REQUIRED FOR THE PLANT CONDITIONS.

REFERENCE DRAWINGS:  
 3-45E769-3, -2, -9, -10.....4160V SHUTDOWN AUX POWER SCHEMATIC DIAGRAMS  
 3-45E767-1.....250V DC SCHEMATIC DIAGRAMS

SYMBOLS:  
 Z3EA.....LOCATED ON 4KV SHUTDOWN BD 3EA  
 Z/A (B,C,D).....LOCATED ON OTHER 4160V BD 3D

COMPANION DRAWINGS:  
 0-45E724-1, -2, -3, -4, -5  
 3-45E724-3, -2, -3, -4, -5

## AMENDMENT 29

POWERHOUSE  
 UNIT 3  
 BROWNS FERRY NUCLEAR PLANT  
 FINAL SAFETY ANALYSIS REPORT

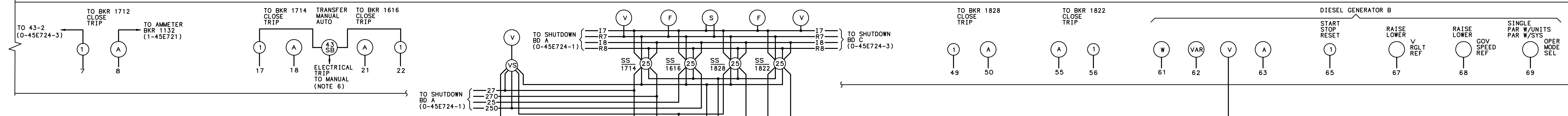
4160V SHUTDOWN BOARD 3EA  
 SINGLE LINE

FIGURE 8.5-4b

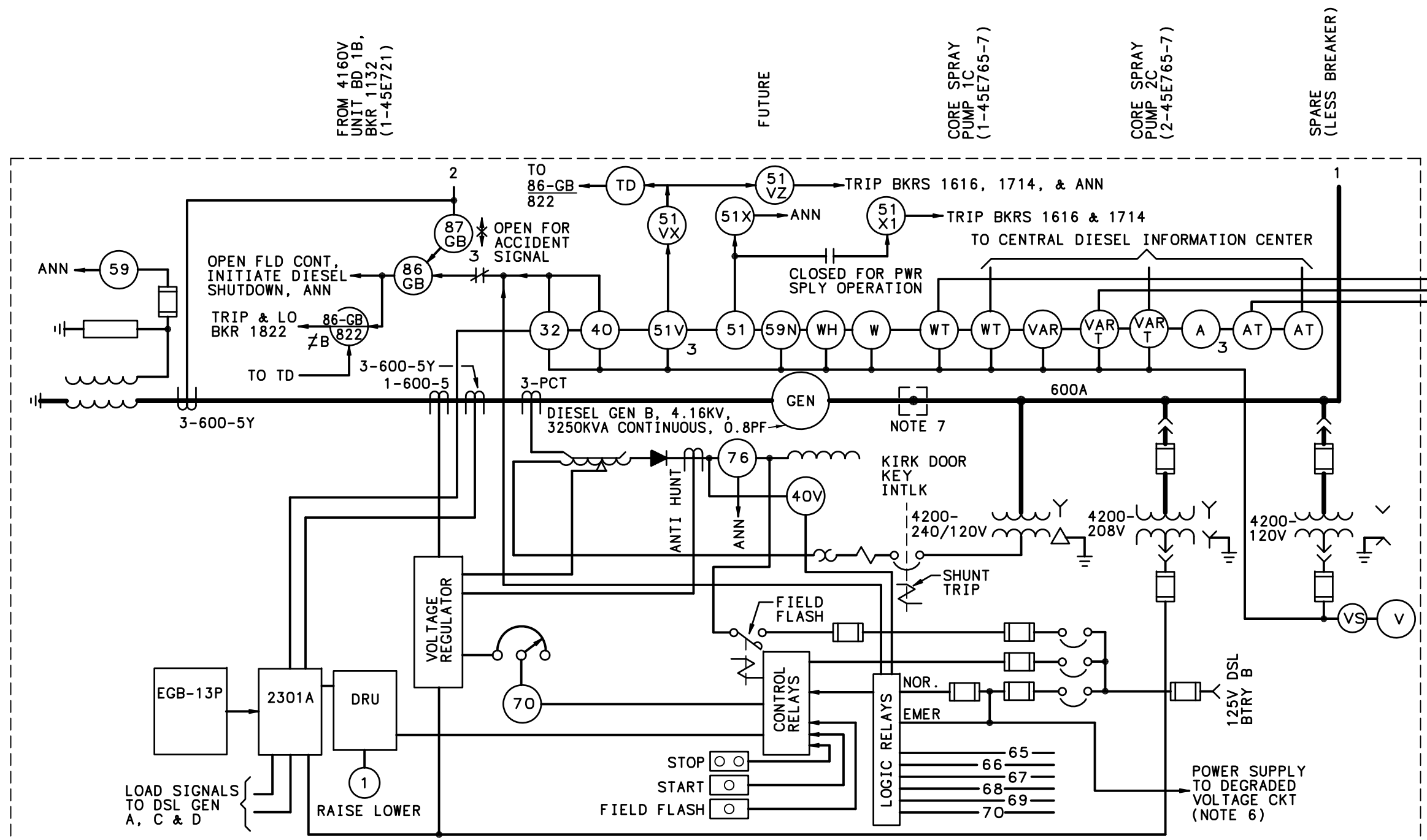
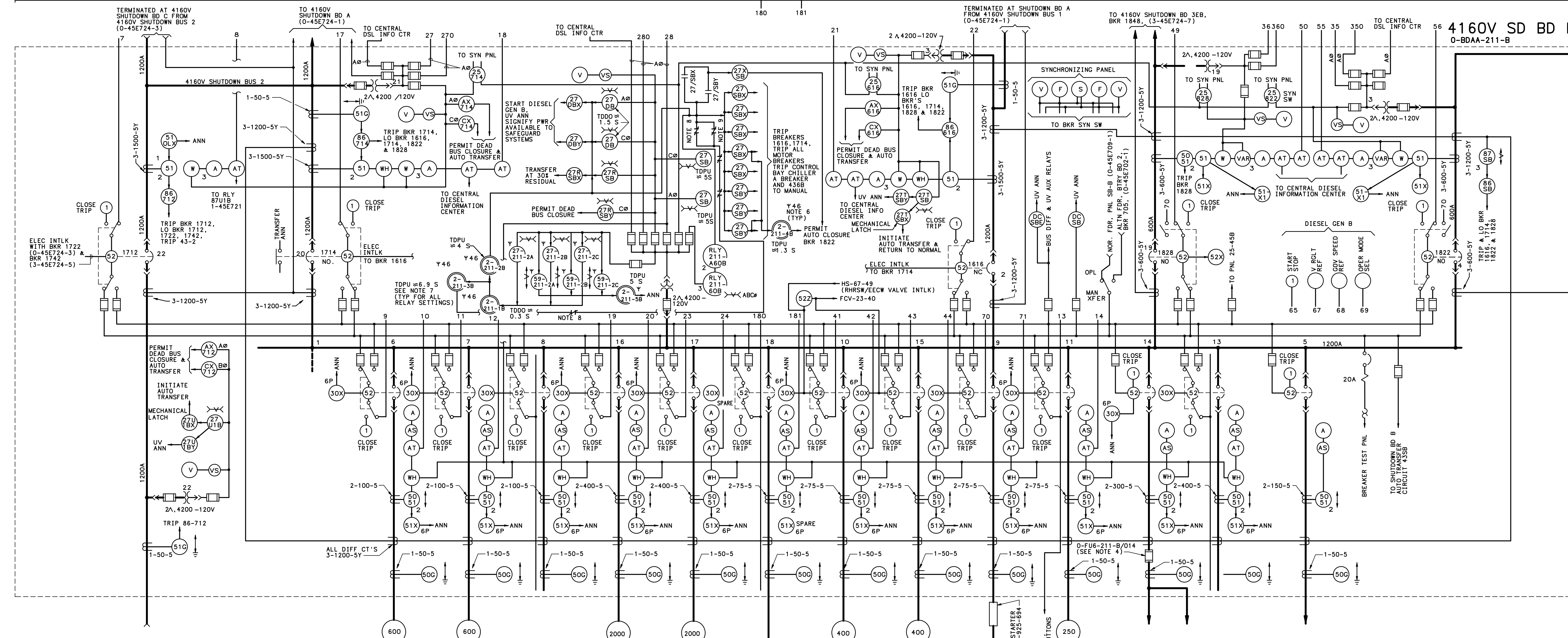
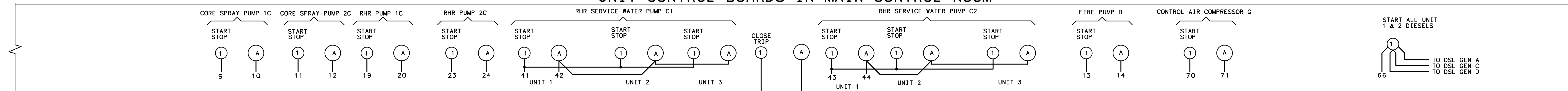


67 E 0-45E724-2 R048

# ELECTRICAL CONTROL BOARD IN UNIT 1-2 MAIN CONTROL ROOM



## UNIT CONTROL BOARDS IN MAIN CONTROL ROOM



- WHEN 4KV SHUTDOWN BOARD B IS ALIGNED TO ITS ALTERNATE 250V DC CONTROL POWER SOURCE (250V DC BATTERY BOARD 2), A SINGLE FAILURE COULD RESULT IN THE LOSS OF DC B AND 3D. THEREFORE, THE FOLLOWING REQUIREMENTS APPLY (NOTE 5):
- 1) A SINGLE FAILURE COULD ADVERSELY IMPACT BOTH ECCS DIVISIONS IN UNIT 2, UNLESS THE NORMAL SUPPLY 250V DC SUBSYSTEM HAS BEEN DECLARED INOPERABLE AND THE PLANT IS ALREADY IN LCO 3.8.4, UNIT 2 SHALL CONSIDER THE NORMAL 250V DC CONTROL POWER SUPPLY TO 4KV SHUTDOWN BOARD B (250V DC DISTRIBUTION PANEL SHUTDOWN BATTERY-B).
  - 2) A SINGLE FAILURE COULD RESULT IN THE LOSS OF TWO RHR/EECW SWING PUMPS THAT COULD BE ALIGNED FOR ECCW INSTEAD OF JUST ONE ECCW PUMP IF THE BOARDS WERE IN A NORMAL ALIGNMENT. IF BOTH THE C1 AND D1 RHR/EECW PUMPS ARE ALIGNED FOR ECCW, UNITS 1, 2 AND 3 SHALL CONSIDER EITHER THE C1 OR THE D1 PUMP INOPERABLE AND ENTER LCO 3.7.2 AS REQUIRED FOR THE PLANT CONDITIONS.
  - 4) A SINGLE FAILURE COULD RESULT IN THE LOSS OF THREE PUMPS NORMALLY ALIGNED FOR RHR/EECW INSTEAD OF JUST TWO RHR PUMPS IF THE BOARDS WERE IN A NORMAL ALIGNMENT. UNITS 1, 2 AND 3 SHALL CONSIDER EITHER THE C1 AND C2, OR THE D1 RHR PUMPS INOPERABLE AND ENTER LCO 3.7.1 AS REQUIRED FOR THE PLANT CONDITIONS.
  - 5) A SINGLE FAILURE COULD CAUSE THE LOSS OF BOTH REDUNDANT TRAINS OF UNIT 3 MAIN CONTROL ROOM AIR CONDITIONING (MCR AC) DUE TO THE LOSS OF ALL MCR AIR HANDLING UNITS (AHU). UNIT 3 SHALL CONSIDER EITHER THE MCR AC TRAIN A OR B INOPERABLE AND ENTER LCO 3.7.4 AS REQUIRED FOR THE PLANT CONDITIONS.

- NOTES:
1. FOR GENERAL NOTES, SYMBOLS, AND REFERENCE DRAWINGS SEE 0-45E724-1.
  2. UNITS ON DRAWING ARE FOR REFERENCE ONLY AND ARE ABBREVIATED TO MEET SPACE CONSTRAINTS, REFER TO MEL FOR COMPLETE UNITS.
  3. DELETED.
  4. ALL THREE FUSES MUST BE REPLACED IF EVER SUBJECTED TO A FAULT CURRENT CAUSING BREAKER TO TRIP.
  5. REFERENCE CALCULATION NO-00999-940013.
  6. MAINTAIN 435B IN MANUAL POSITION.
  7. PLANNED CONNECTION POINT FOR FLEX GENERATOR. CABLES SHALL BE LIFTED OFF THE EDC LEADS AND LOGGED DIRECTLY TO FLEX GENERATOR CABLES.

SYMBOLS:  
2A(B,C,D) - COMPONENTS ON OTHER 4160V SHUTDOWN BOARD

COMPANION DRAWINGS:  
0-45E724-1, -3, -4, -5, -6, -7, -8, -9

## AMENDMENT 29

POWERHOUSE  
UNITS 1-3  
BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

4160-V SHUTDOWN BOARD B  
SINGLE LINE

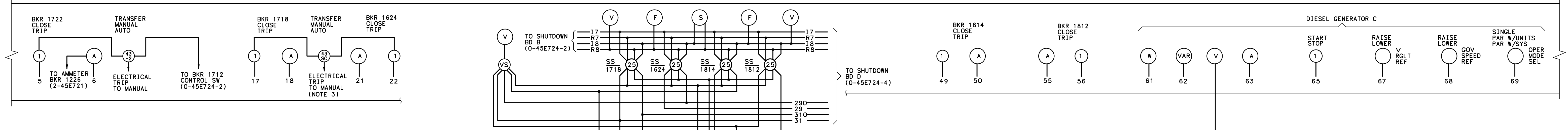
FIGURE 8.5-4c



67 E 0-45E724-3 R054

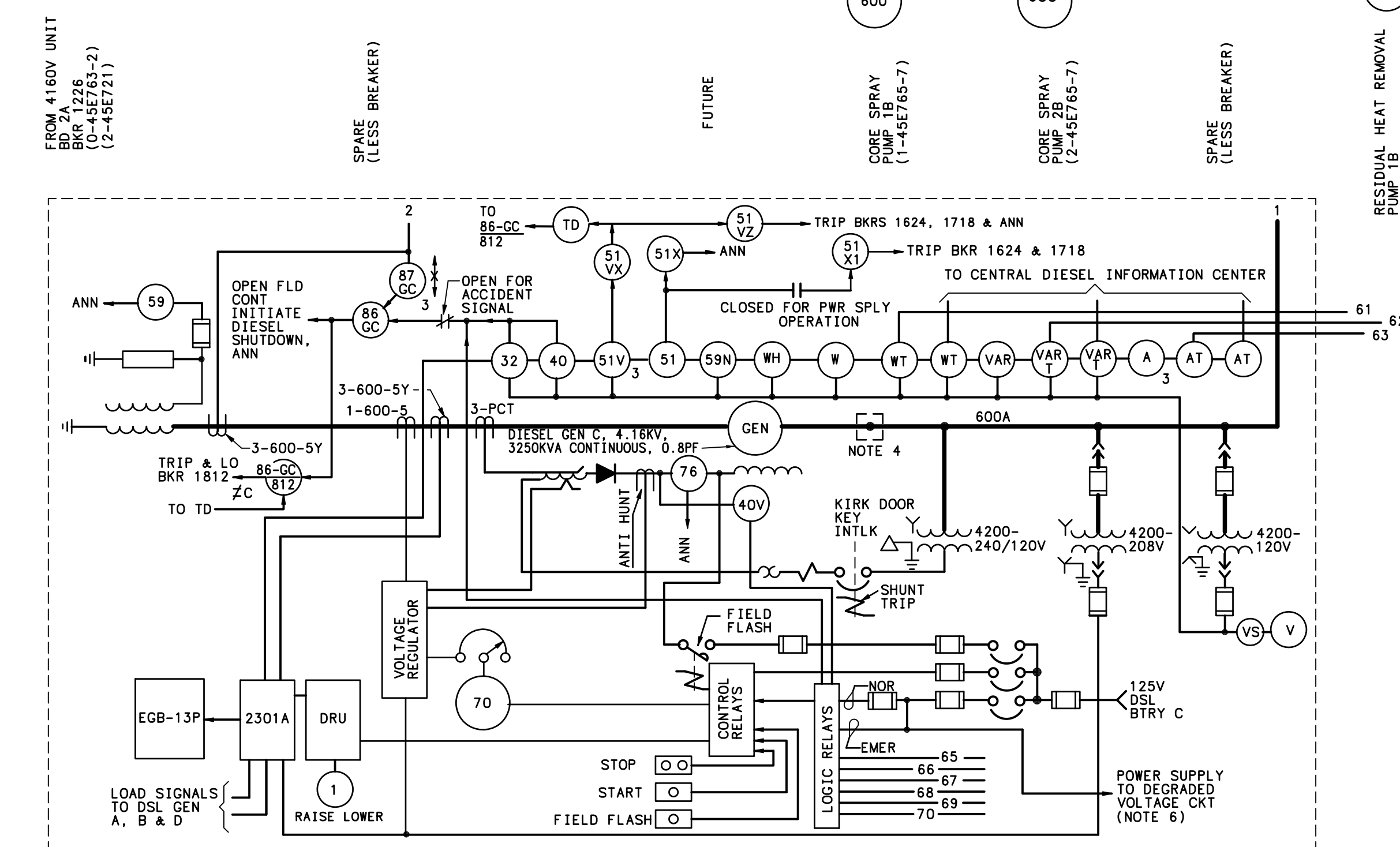
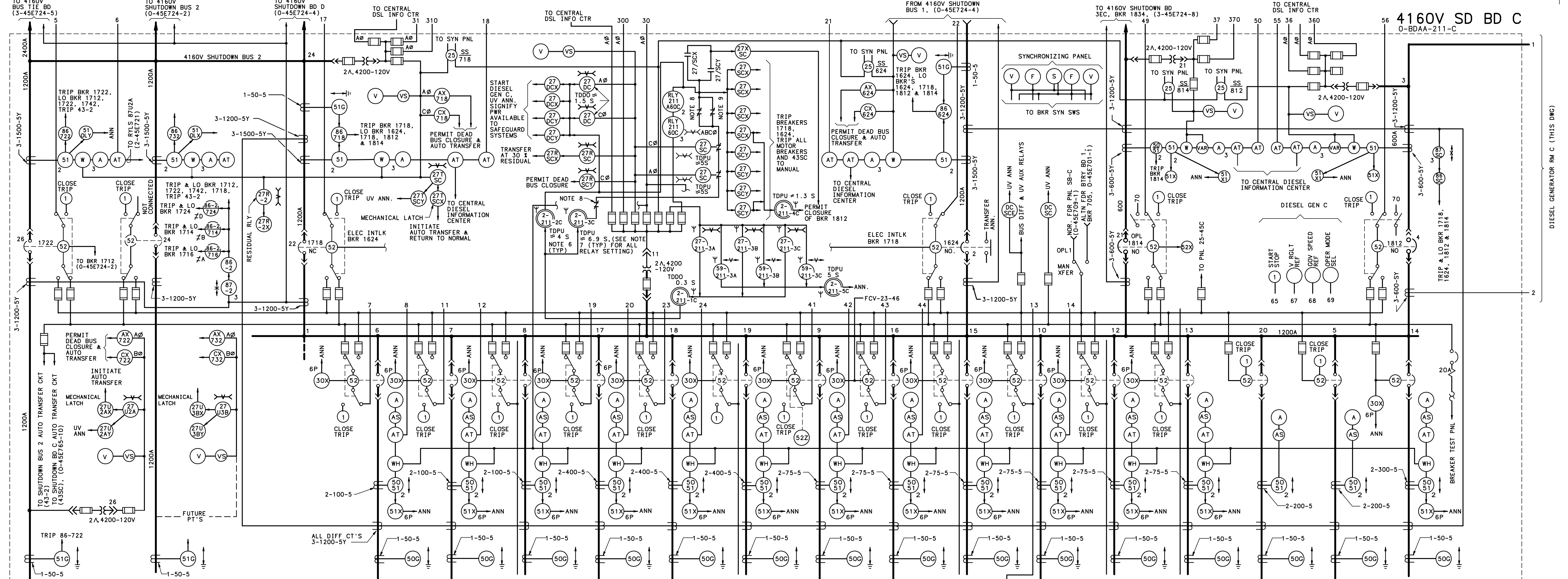
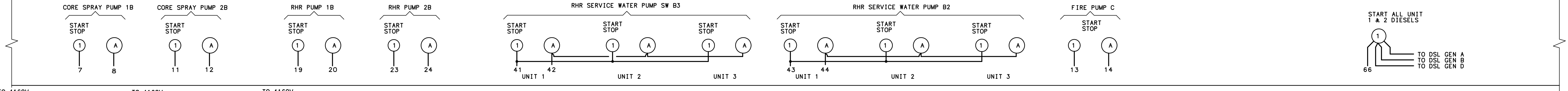
# ELECTRICAL CONTROL BOARD

IN UNIT 1-2 MAIN CONTROL ROOM



## UNIT CONTROL BOARDS

IN MAIN CONTROL ROOM



- NOTES:
1. FOR GENERAL NOTES, SYMBOLS, AND REFERENCE DRAWINGS SEE 0-45E724-1.
  2. REFERENCE CALCULATION NO-00993-340013.
  3. MAINTAIN 43SC IN MANUAL POSITION.
  4. PLANNED CONNECTION POINT FOR FLEX GENERATOR. CABLES SHALL BE LIFTED UP THE EDC LEADS AND LUGGED DIRECTLY TO FLEX GENERATOR CABLES.

REFERENCE DRAWINGS:

0-45E701-1, ..... WIRING DIAGRAM BATTERY BOARD 1, PANELS

0-45E724-1, ..... 1-7, SINGLE LINE

0-45E763-2, ..... WIRING DIAGRAM 4160V UNIT AUXILIARY POWER DC SCHEMATIC DIAGRAM

SYMBOLS:

2A(B,C,D) - COMPONENTS ON OTHER 4160V SHUTDOWN BOARD

BREAKER SYMBOLS FOR UNIT 1, 2 & 3 OPERATION:

OPL - OPEN, ALLOWED TO BE CLOSED FOR LOAD NOT EXCEEDING 340 AMPS, MAY EXCEED 340 AMPS ONCE, FOR A MAXIMUM OF 150 HOURS.

OPL1 - A SINGLE FAILURE COULD RESULT IN THE LOSS OF DG C AND 3A, AND TWO PUMPS NORMALLY ALIGNED FOR EDCW (INSTEAD OF JUST ONE EDCW PUMP IF THE BOARDS WERE IN A NORMAL ALIGNMENT). UNITS 1, 2 AND 3 SHALL CONSIDER EITHER THE A3 OR THE B3 EDCW PUMP INOPERABLE AND ENTER LCO 3.7.2 AS REQUIRED FOR THE PLANT CONDITIONS.

COMPANION DRAWINGS:

0-45E724-1

0-45E724-2

## AMENDMENT 29

POWERHOUSE  
UNITS 1-3

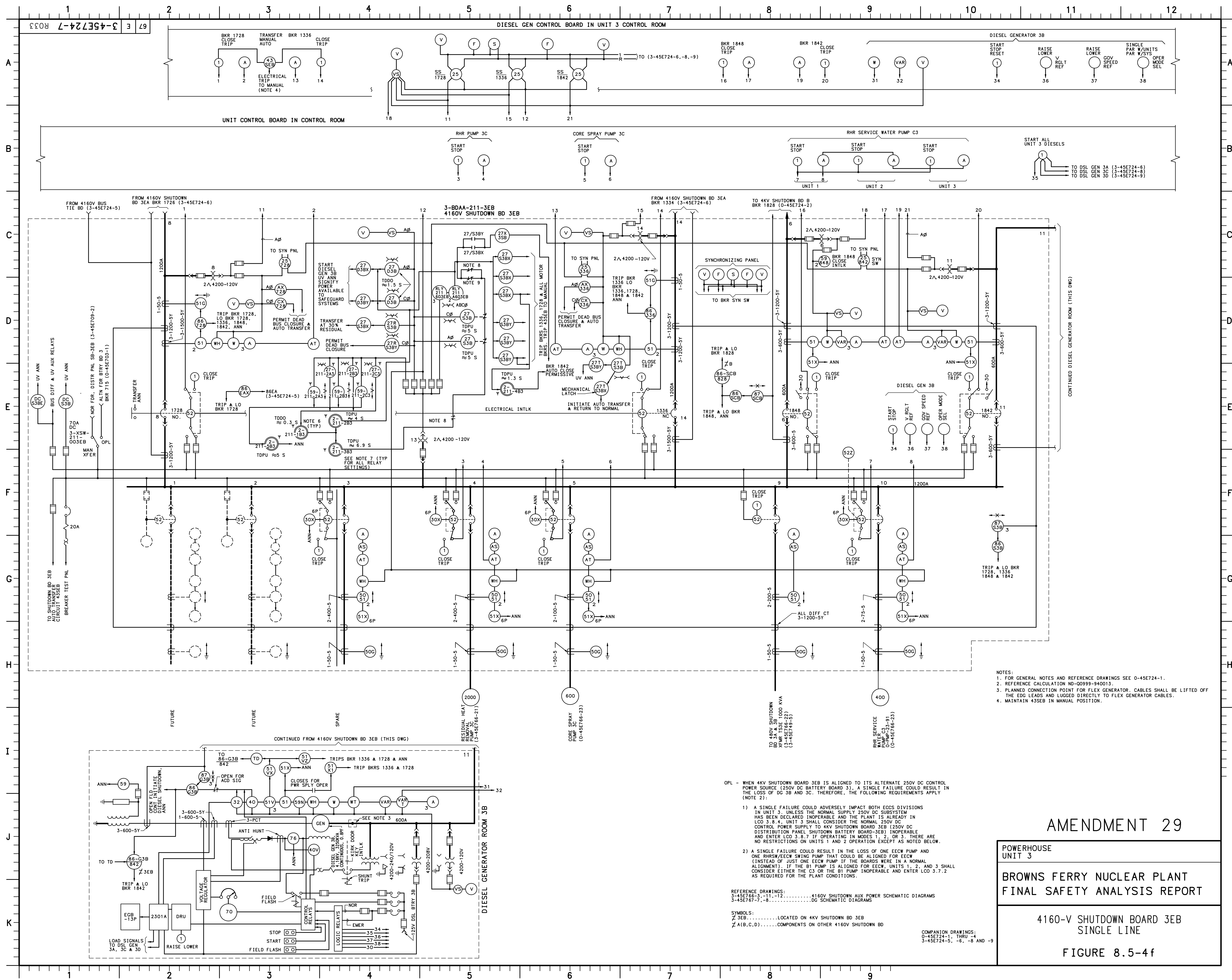
BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

4160-V SHUTDOWN BOARD C  
SINGLE LINE

FIGURE 8.5-4d





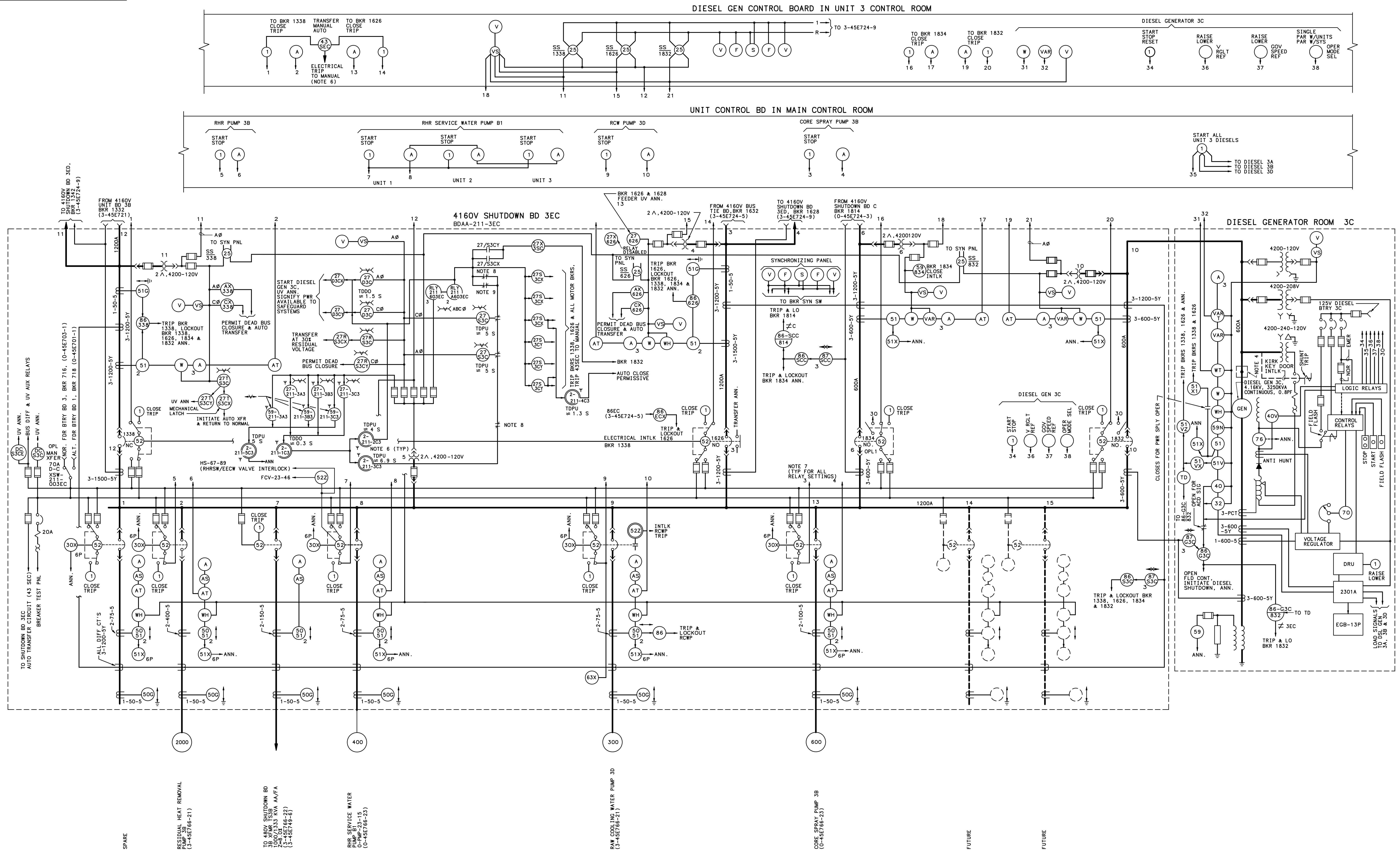


## AMENDMENT 29

POWERHOUSE  
UNIT 3  
BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

4160-V SHUTDOWN BOARD 3EB  
SINGLE LINE

FIGURE 8.5-4f



- NOTES:
1. FOR GENERAL NOTES AND REFERENCE DRAWINGS SEE 0-45E724-1.
  2. UNITS ON DRAWINGS ARE FOR REFERENCE ONLY AND ARE TO BE ABBREVIATED TO MEET SPACE CONSTRAINTS. REFER TO MEL FOR COMPLETE UNITS. ALL UNITS ARE PREFIXED 09N-5 UNLESS OTHERWISE NOTED.
  3. REFERENCE CALCULATION NO-00999-940013
  4. PLANNED CONNECTION POINT FOR FLEX GENERATOR. CABLES SHALL BE LIFTED OFF THE EDD LEADS AND LUGGED DIRECTLY TO FLEX GENERATOR CABLES.
  5. DELETED.
  6. MAINTAIN 43SEC IN MANUAL POSITION.
- REFERENCE DRAWINGS:
- 0-45E701-1.....WIRING DIAGRAM BATTERY BOARD 1 PANELS 1-7 SINGLE LINE
  - 0-45E703-1.....WIRING DIAGRAM BATTERY BOARD 3 PANELS 1-7 SINGLE LINE
  - 3-45E786-5,6,13.....1160V SHUTDOWN AUX POWER SCH DIAGRAMS
  - 14-19,27,28.....DIESEL GEN SCH DIAGRAMS
- SYMBOL:
- ≠ SEC - LOCATED IN 4KV SHUTDOWN BOARD 3EC
  - ≠ A(B,C,D) - COMPONENTS ON OTHER 4160V SHUTDOWN BOARD
- COMPANION DRAWINGS:
- 3-45E724-5,-6,-7,-9
  - 0-45E724-1 THRU -4
- OP1 - OPEN, ALLOWED TO BE CLOSED FOR LOAD NOT EXCEEDING 400 AMPS. MAY EXCEED 340 AMPS ONCE, FOR A MAXIMUM OF 100 HOURS.

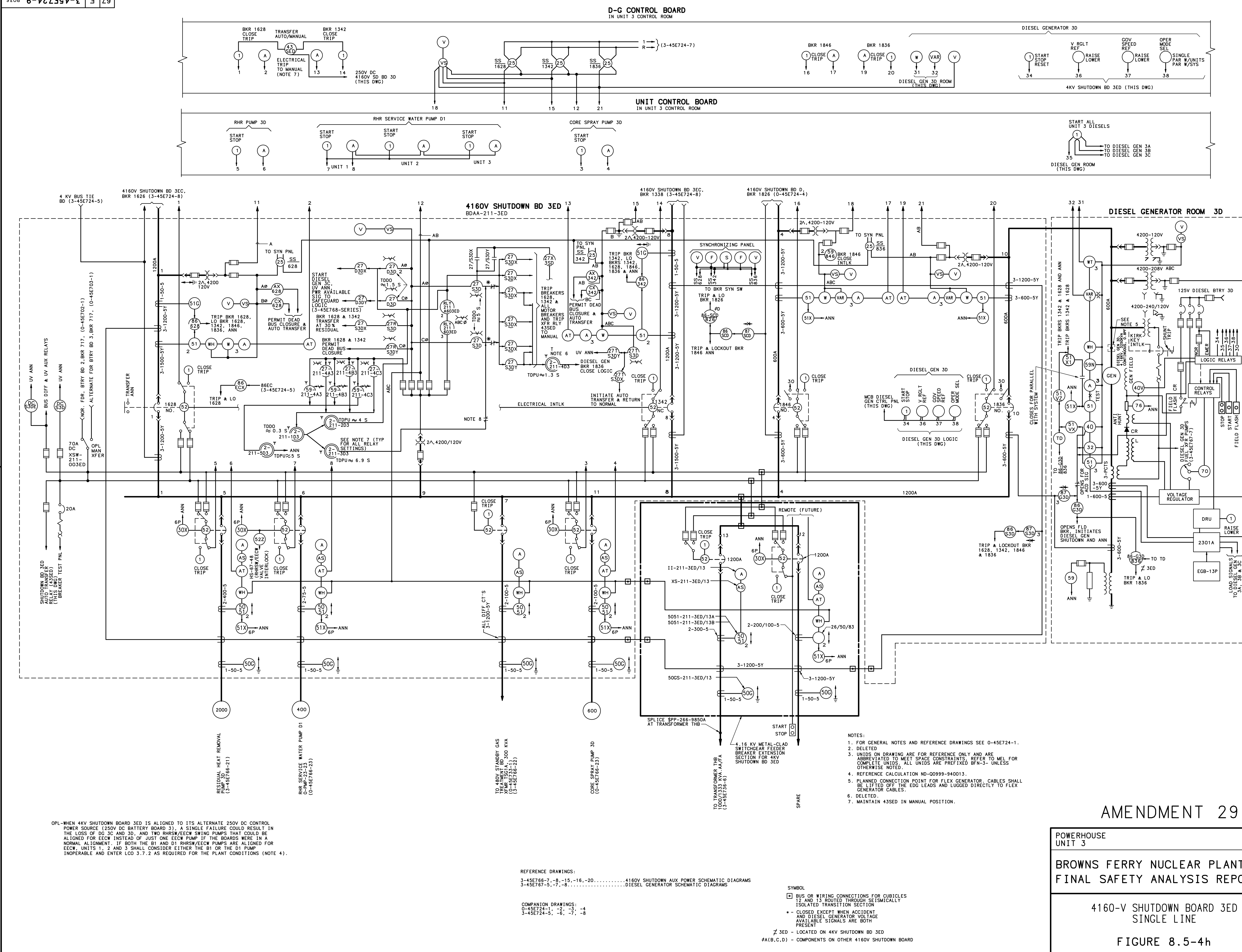
## AMENDMENT 29

POWERHOUSE  
UNIT 3  
BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

4160V SHUTDOWN BOARD 3EC  
SINGLE LINE

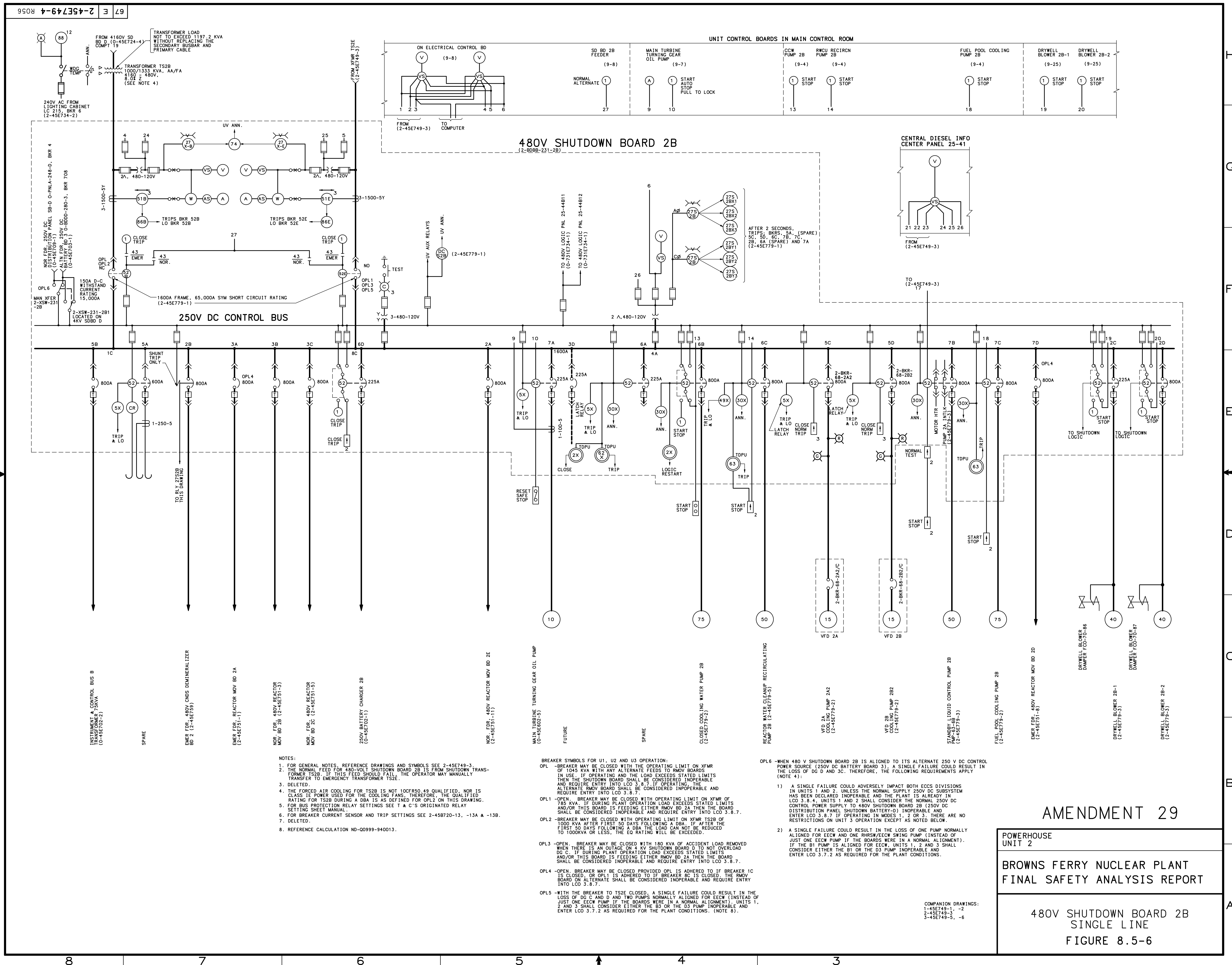
FIGURE 8.5-4g











BFN-16

Figure 8.5-7

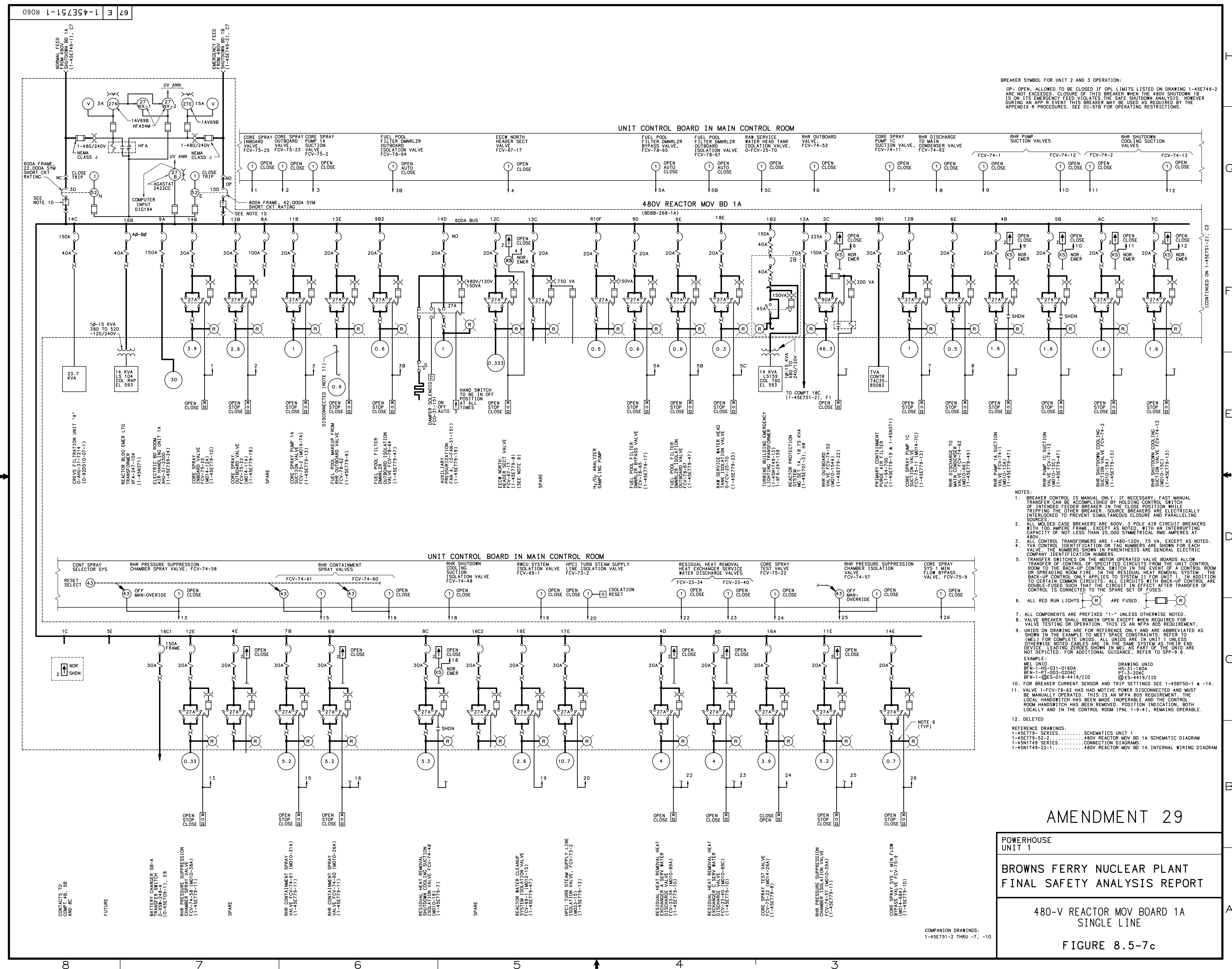
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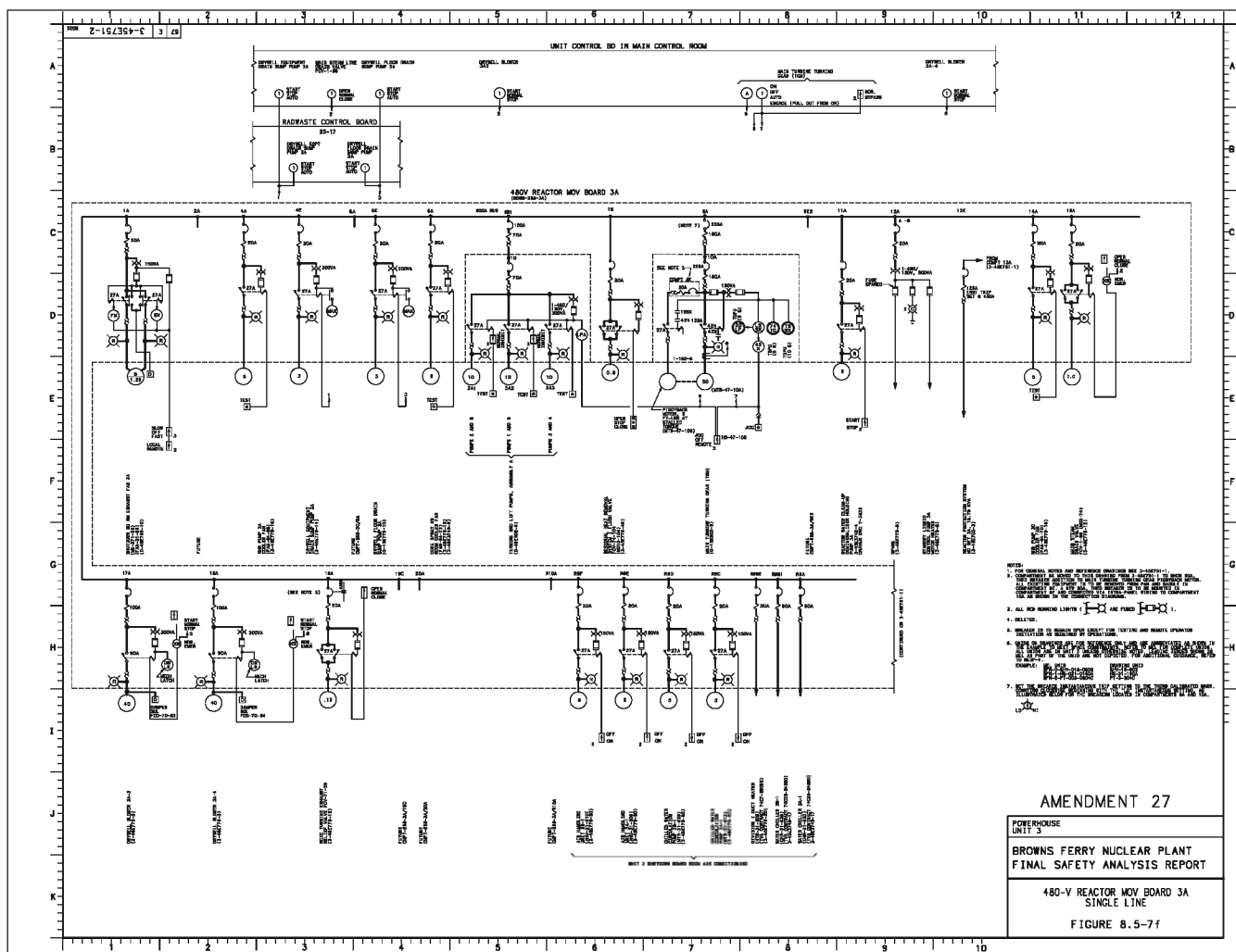










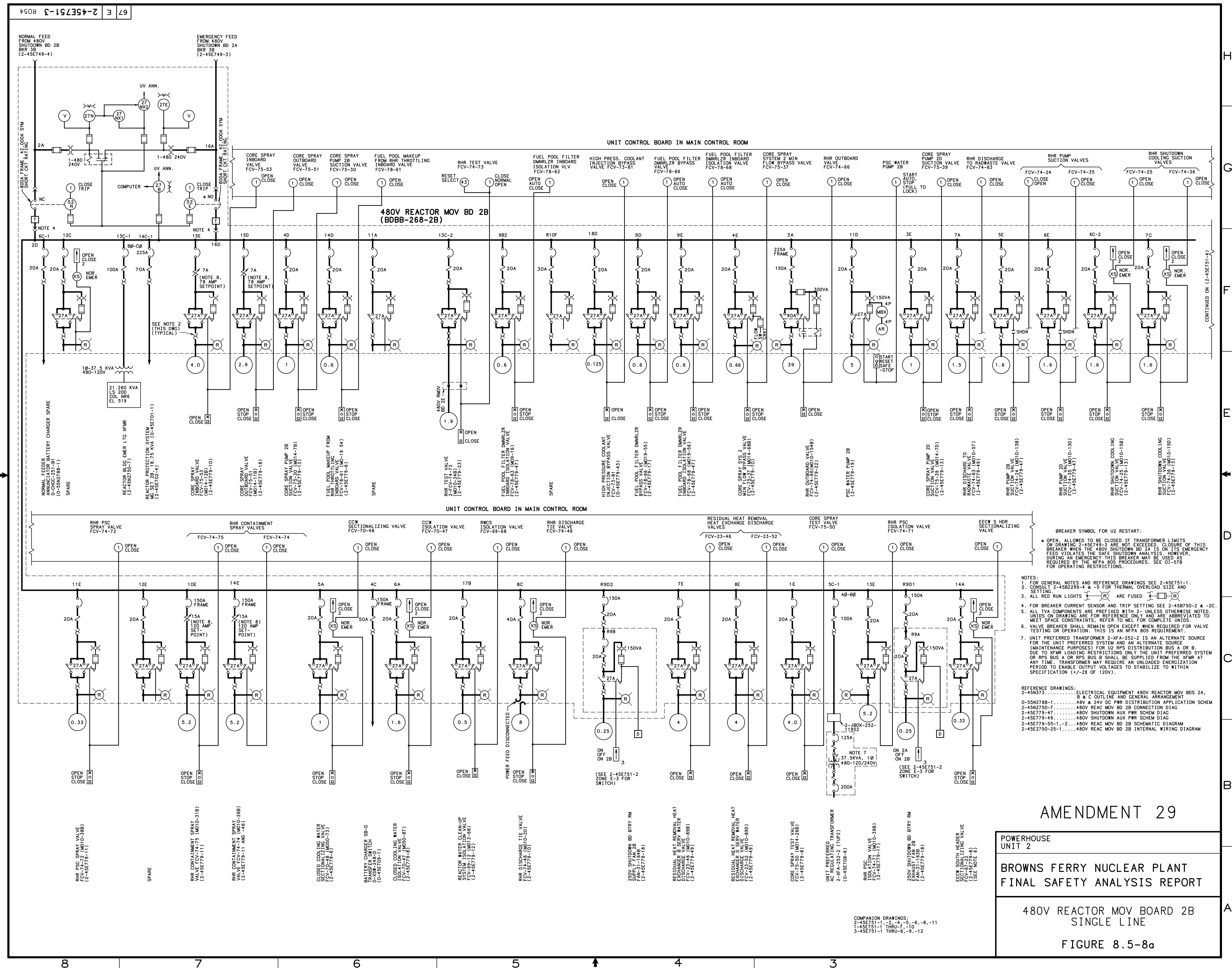


BFN-16

Figure 8.5-8

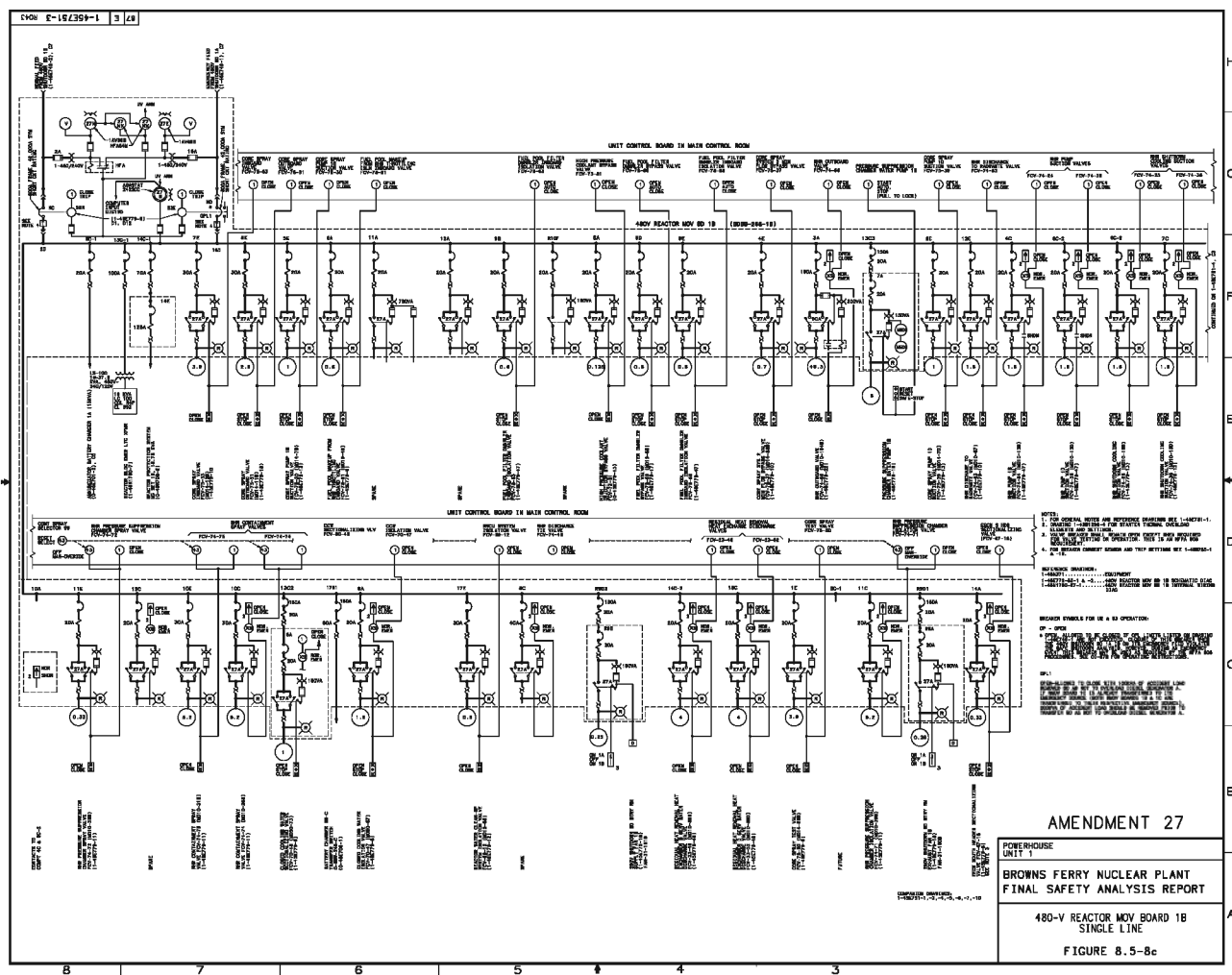
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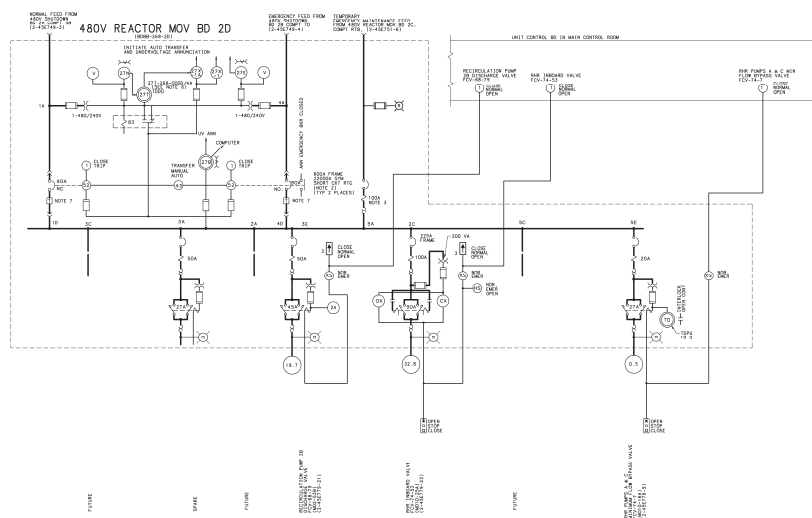












- NOTES:
1. FOR GENERAL NOTES, SYMBOLS AND REFERENCE DRAWINGS SEE 2-43E7819-3.
  2. FEEDER BREAKERS CONTROL IS AUTOMATIC-MANUAL SELECTABLE. FEEDER BREAKERS ARE TO BE INSTALLED IN THE NORMAL SOURCE OF SUPPLY. FEEDERS ARE TO BE TRANSFERRED TO THE EMERGENCY SOURCE (RANXIN BACK TO THE EMERGENCY SOURCE) IN THE EVENT OF A LOSS OF THE NORMAL SOURCE IN ORDER TO PREVENT A LOSS OF THE EMERGENCY SOURCE. FEEDERS ARE TO BE ELECTRICALLY INTERLOCKED TO PREVENT SIMULTANEOUS CLOSURE AND OPENING OF THE FEEDER BREAKERS.
  3. THE EMERGENCY MAINTENANCE FEED MAY ONLY BE EXHAUSTED & USED TO SERVE THE "EMERGENCY MAINTENANCE FEED" AND NOT BE USED TO SERVE THE "POWER SUPPLANT" OR HOT STANDBY MOTORS.
  4. (SEE DRAWING REVISIONS 3-1)
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  61. (SEE DRAWING REVISIONS 3-1)
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  96. (SEE DRAWING REVISIONS 3-1)
  97. (SEE DRAWING REVISIONS 3-1)
  98. (SEE DRAWING REVISIONS 3-1)
  99. (SEE DRAWING REVISIONS 3-1)
  100. (SEE DRAWING REVISIONS 3-1)

AMENDMENT 25

POWERHOUSE UNIT 2
BROWNS FERRY NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
480V REACTOR MOV BOARD 2D SINGLE LINE FIGURE 8.5-10

NO ISSUE FOR ECU L1941

COMPARISON DRAWINGS:  
1-2 3-456781-1, -2, -3, -4, -5, -6  
1-456781-7, -10  
3-456781-9, -12  
2-456781-11

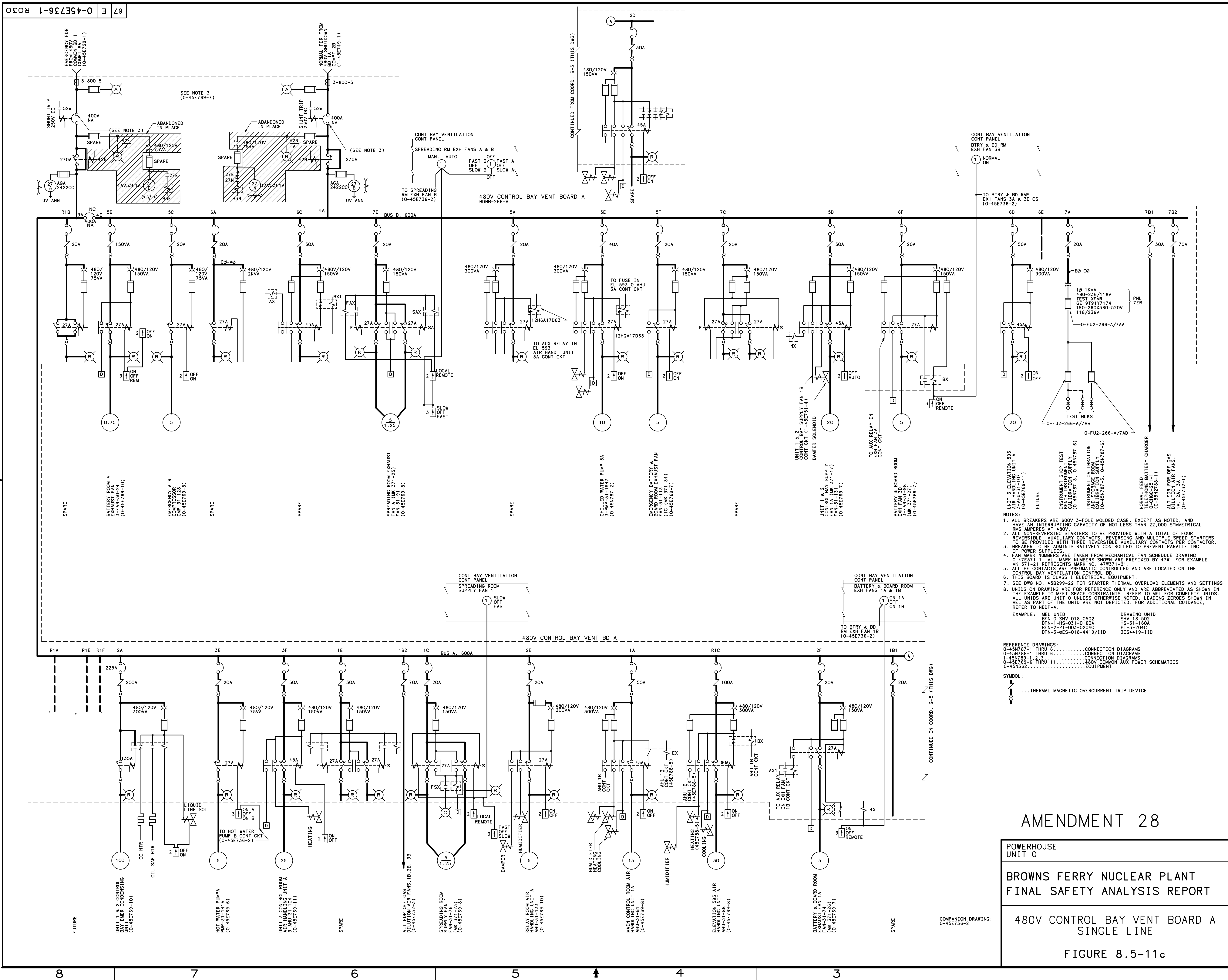




BFN-16

Figure 8.5-11b

Deleted by Amendment 7.



AMENDMENT 28

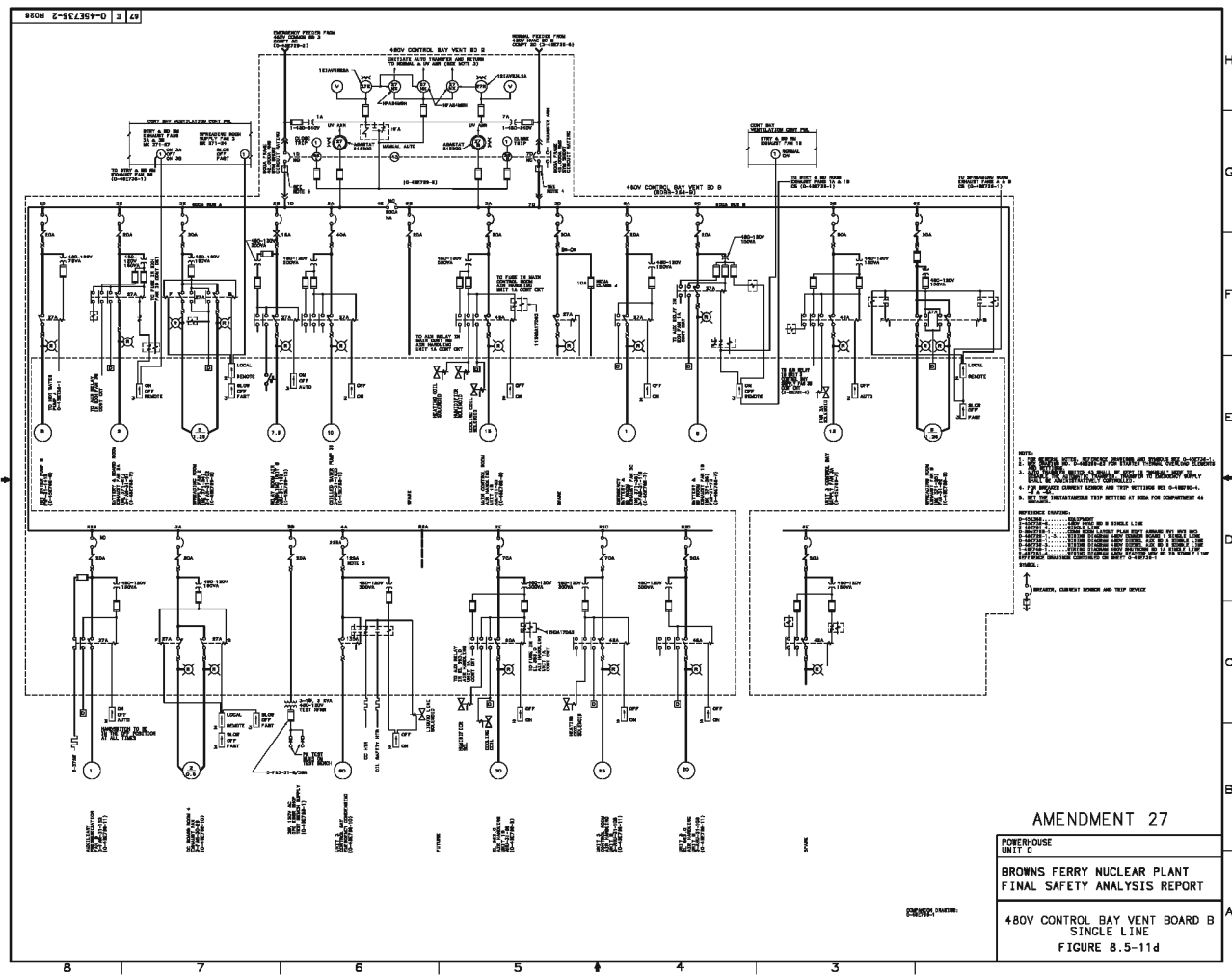
POWERHOUSE  
UNIT 0  
BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

480V CONTROL BAY VENT BOARD A  
SINGLE LINE

FIGURE 8.5-11c

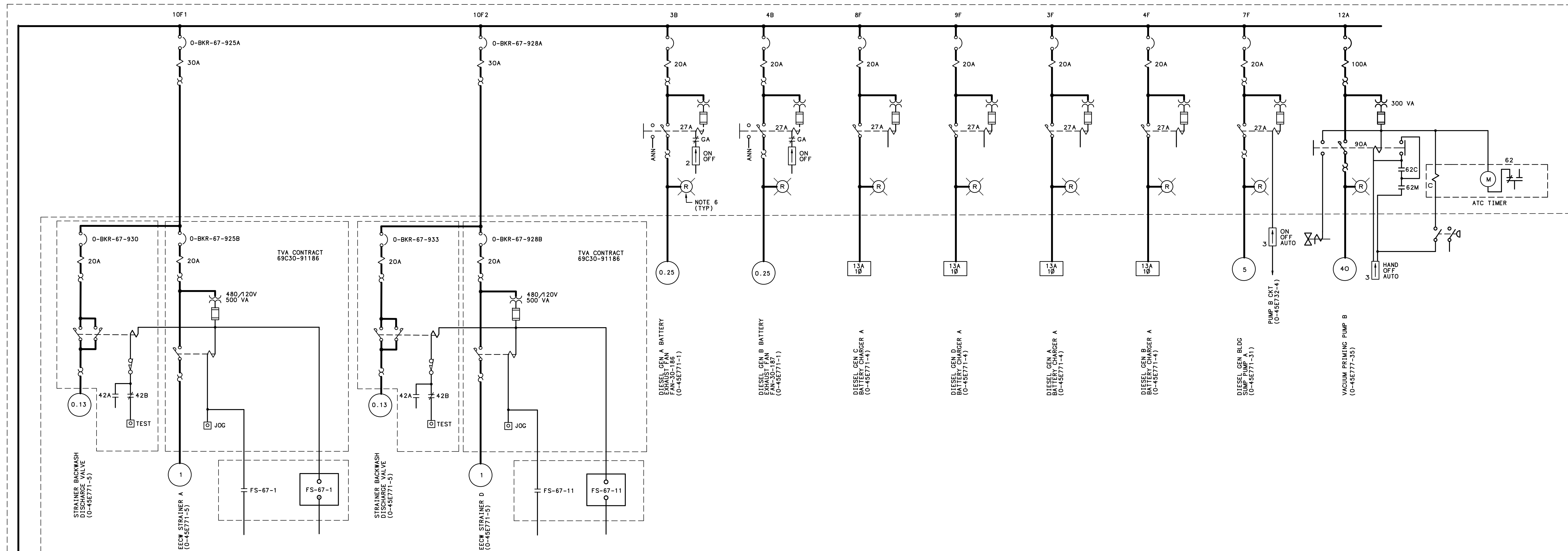
COMPANION DRAWING:  
0-45E736-2



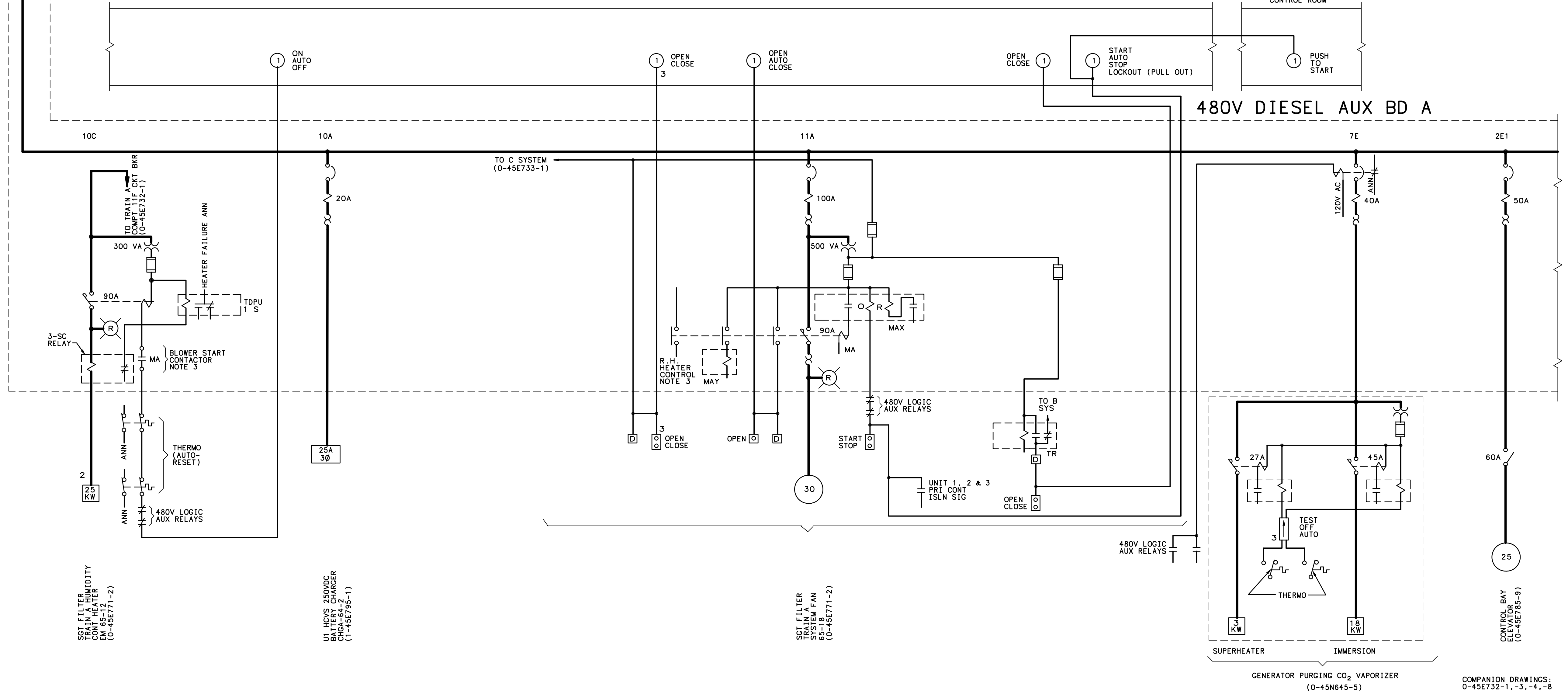




# 480V DIESEL AUX BD A



## UNIT 1 CONTROL BOARD IN MAIN CONTROL ROOM



- NOTES:
1. FOR GENERAL NOTES, REFERENCE DRAWINGS AND SYMBOLS SEE 0-45E732-1.
  2. SEE DRAWING NO. 1-45E732-2 FOR STARTER THERMAL OVERLOAD ELEMENTS AND SETTINGS.
  3. R.H. HEATERS ARE ENERGIZED BY THE BLOWER START CONTACTOR WITH THE SBCT FLOW SWITCHES ABANDONED IN PLACE BY DCN 61407.
  4. DELETED.

## AMENDMENT 29

DIESEL GENERATOR BUILDING  
UNIT 0

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

480V DIESEL AUXILIARY BOARD A  
SINGLE LINE

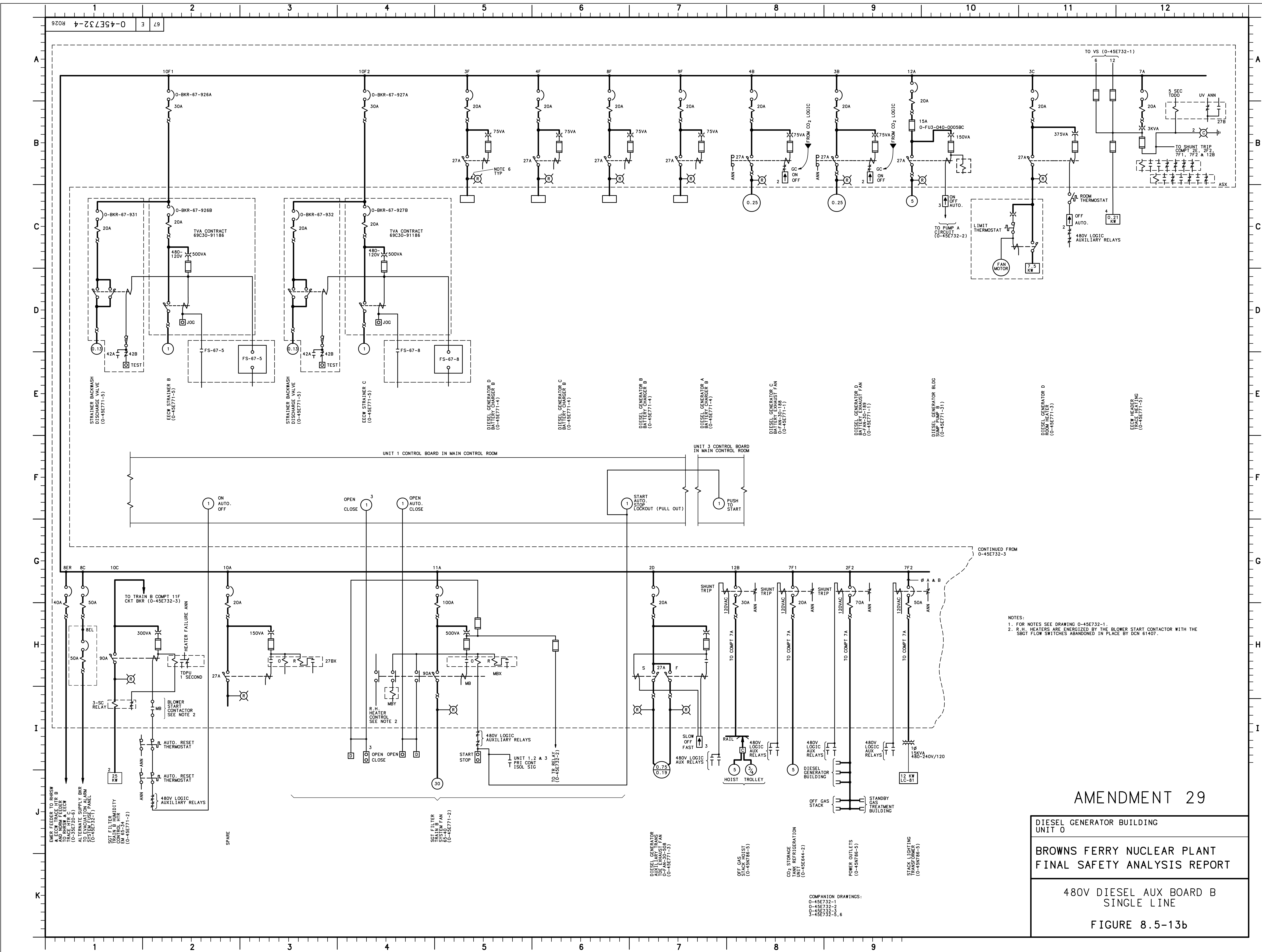
FIGURE 8.5-12b

COMPANION DRAWINGS:  
0-45E732-1, -3, -4, -8  
3-45E732-5, -6













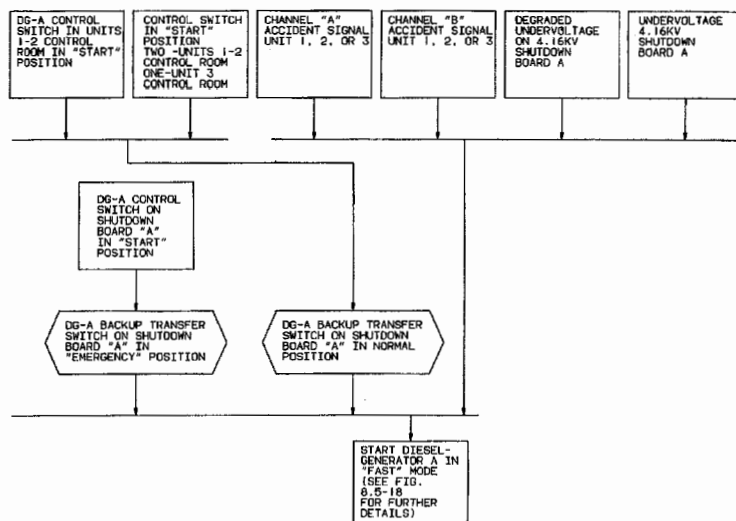




BFN-16

Figure 8.5-14

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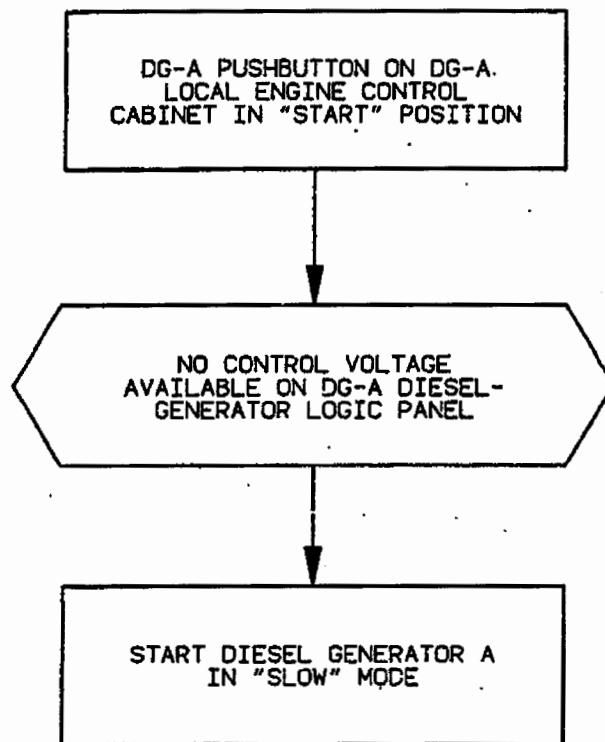


NOTE:  
1. FOR DIESEL GENERATOR A, ALL OTHER DIESEL GENERATORS SIMILAR.

# AMENDMENT 22

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

DIESEL GENERATOR LOGIC  
DIAGRAM  
FAST START  
FIGURE 8.5-14a



NOTE: FOR DIESEL GENERATOR A;  
ALL OTHER DIESEL GENERATORS  
SIMILAR.

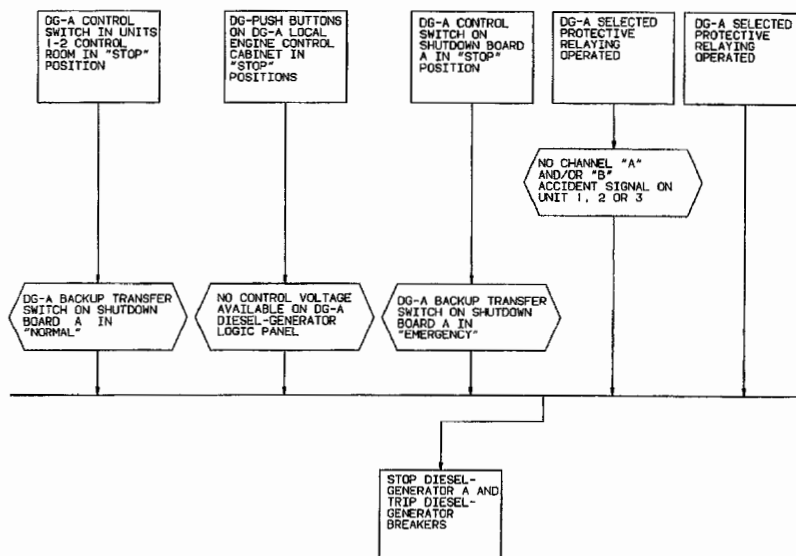
## AMENDMENT 16

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

DIESEL GENERATOR LOGIC DIAGRAM-  
SLOW START

FIGURE 8.5-14b



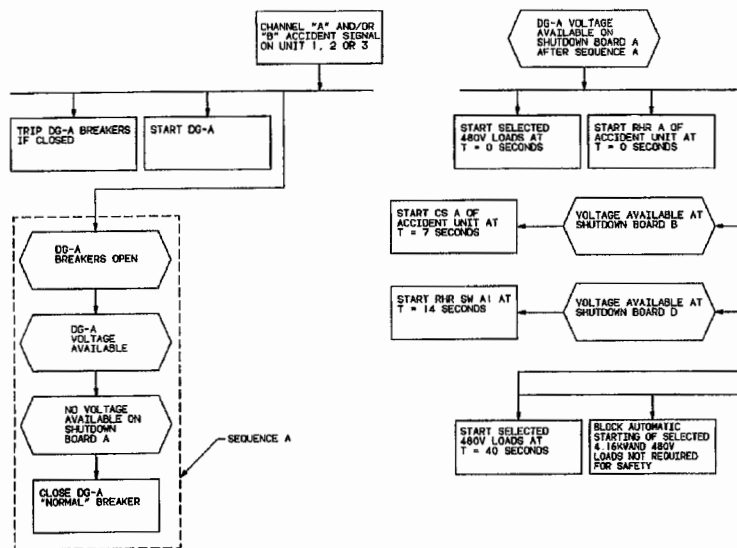


NOTE:  
1. FOR DIESEL GENERATOR A, ALL OTHER DIESEL GENERATORS SIMILAR.

#### AMENDMENT 22

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

DIESEL GENERATOR LOGIC  
DIAGRAM  
STOP  
FIGURE 8.5-14c



NOTE:  
 1. FOR DIESEL GENERATOR A, ALL OTHER DIESEL GENERATORS SIMILAR

#### AMENDMENT 22

BROWNS FERRY NUCLEAR PLANT  
 FINAL SAFETY ANALYSIS REPORT

DIESEL GENERATOR  
 LOGIC DIAGRAM  
 AUTOMATIC LOADING  
 FIGURE 8.5-15

LOSS OF VOLTAGE ON  
SHUTDOWN BOARD A  
FOR 5 SECONDS WITH  
NORMAL SOURCE OF  
POWER

↓

TRIP ALL MOTOR  
FEEDER BREAKERS AND  
NORMAL SOURCE  
INCOMING BREAKERS  
ON SHUTDOWN BOARD A

LOSS OF VOLTAGE ON  
SHUTDOWN BOARD A  
FOR 5 SECONDS WITH  
DIESEL GENERATOR  
SOURCE OF POWER

↓

NO ACCIDENT SIGNAL ON  
UNIT 1, 2 OR 3

↓

TRIP ALL MOTOR  
FEEDER BREAKERS  
ON SHUTDOWN BOARD  
A

NOTE:  
1. FOR SHUTDOWN BOARD A,  
ALL OTHER SHUTDOWN BOARDS SIMILAR.

AMENDMENT 22

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

STANDBY A-C POWER LOGIC DIAGRAM  
LOAD SHEDDING, 4.16KV SHUTDOWN  
BOARD  
FIGURE 8.5-16a

LOSS OF VOLTAGE ON  
480V SHUTDOWN BOARD  
FOR 2 SECONDS

TRIP SELECTED  
MOTOR FEEDER  
BREAKERS

CHANNEL "A" AND/OR  
"B" ACCIDENT SIGNAL  
ON UNIT 1 OR 2;  
CHANNEL "A" OR "B"  
ACCIDENT SIGNAL ON  
UNIT 3

DIESEL GENERATOR A,  
B, C OR D VOLTAGE  
AVAILABLE ON A 4.16KV  
SHUTDOWN BOARD  
ASSOCIATED DIESEL  
GENERATOR 3A, 3B OR  
3C VOLTAGE AVAILABLE

SELECTED MOTOR FEEDER  
BREAKERS TRIPPED AND  
THEN AUTOMATICALLY  
RECLOSED AFTER A TIME  
DELAY

SELECTED MOTOR FEEDER  
BREAKERS TRIPPED AND  
BLOCKED FROM AUTOMATIC  
RECLOSE

AMENDMENT 22

REACTOR BUILDING  
UNITS 1, 2 & 3

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

STANDBY A-C POWER LOGIC DIAGRAM  
LOAD SHEDDING, 480V SHUTDOWN  
BOARD

FIGURE 8.5-16b



LOSS OF VOLTAGE ON  
480V REACTOR MOV  
BOARD

SELECTED STARTERS  
OPEN

CHANNEL "A" AND/OR  
"B" ACCIDENT SIGNAL  
ON UNIT 1 OR 2;  
CHANNEL "A" OR "B"  
ACCIDENT SIGNAL ON  
UNIT 3

DIESEL GENERATOR A,  
B, C OR D VOLTAGE  
AVAILABLE ON A 4.16KV  
SHUTDOWN BOARD  
ASSOCIATED DIESEL  
GENERATOR 3A, 3B OR  
3C VOLTAGE AVAILABLE

SELECTED STARTERS  
TRIPPED AND BLOCKED  
FROM AUTOMATIC  
RECLOSURE

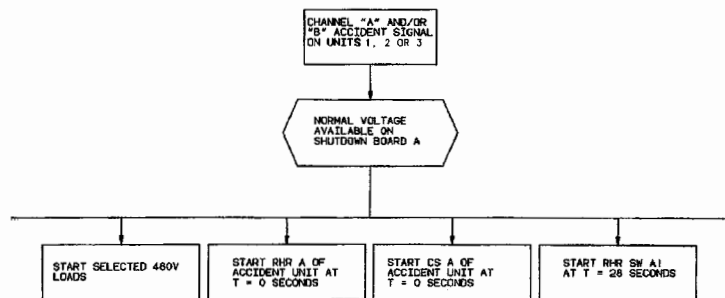
SELECTED STARTERS  
TRIPPED AND THEN  
AUTOMATICALLY  
RECLOSED AFTER A TIME  
DELAY

AMENDMENT 22

UNITS 1, 2 & 3

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

STANDBY A-C POWER LOGIC DIAGRAM  
LOAD SHEDDING, 480V REACTOR  
MOV BOARD  
FIGURE 8.5-16c



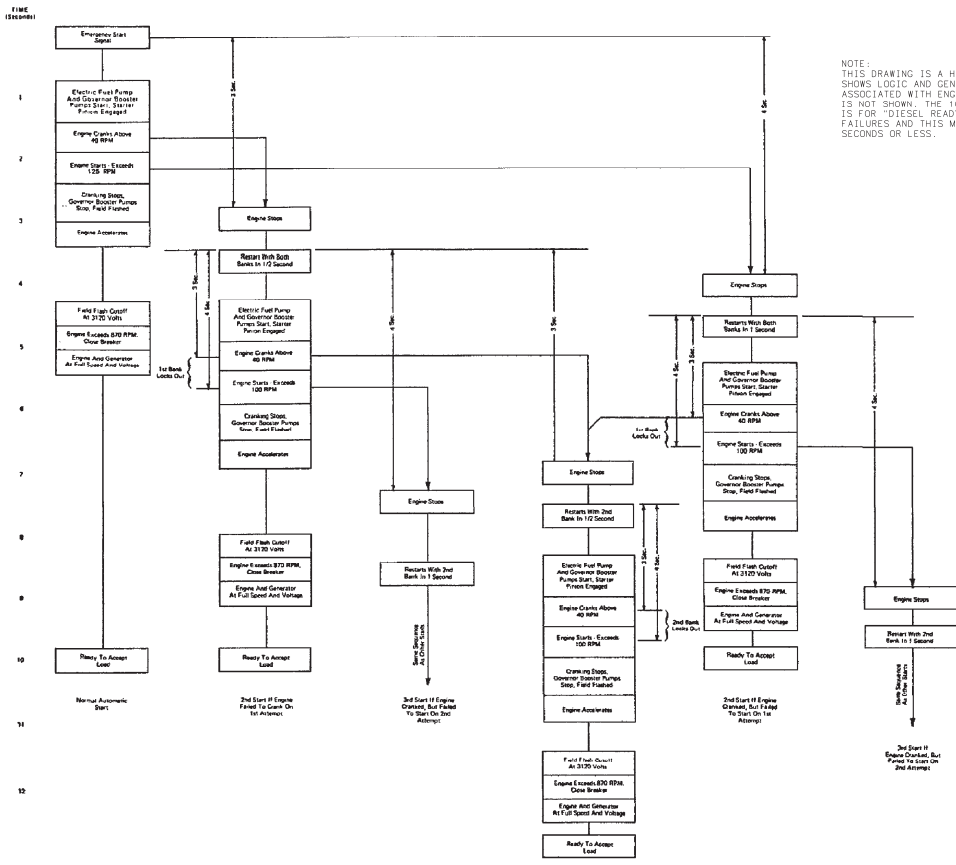
NOTE:  
1. FOR SHUTDOWN BOARD A, ALL  
OTHER SHUTDOWN BOARDS SIMILAR.

#### AMENDMENT 22

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

STANDBY A-C POWER LOGIC DIAGRAM  
AUTOMATED LOADING OF SHUTDOWN  
BOARD, NORMAL POWER AVAILABLE  
FIGURE 8.5-17

# OPERATION



NOTE:  
THIS DRAWING IS A HISTORICAL VENDOR DRAWING THAT SHOWS LOGIC AND GENERAL TIMING. SOME OF THE TIMING ASSOCIATED WITH ENGINE FAILURE TO SUCCESSFULLY START IS NOT SHOWN. THE 10 SECONDS SHOWN ON THE FAR LEFT IS FOR "DIESEL READY TO ACCEPT LOAD" WITHOUT ANY FAILURES AND THIS MATCHES THE TS REQUIREMENT OF 10 SECONDS OR LESS.

AMENDMENT 25

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

DIESEL START ATTEMPTS  
BLOCK DIAGRAM

FIGURE 8.5-18

BFN-16

Figure 8.5-19

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BFN-16

Figure 8.5-20

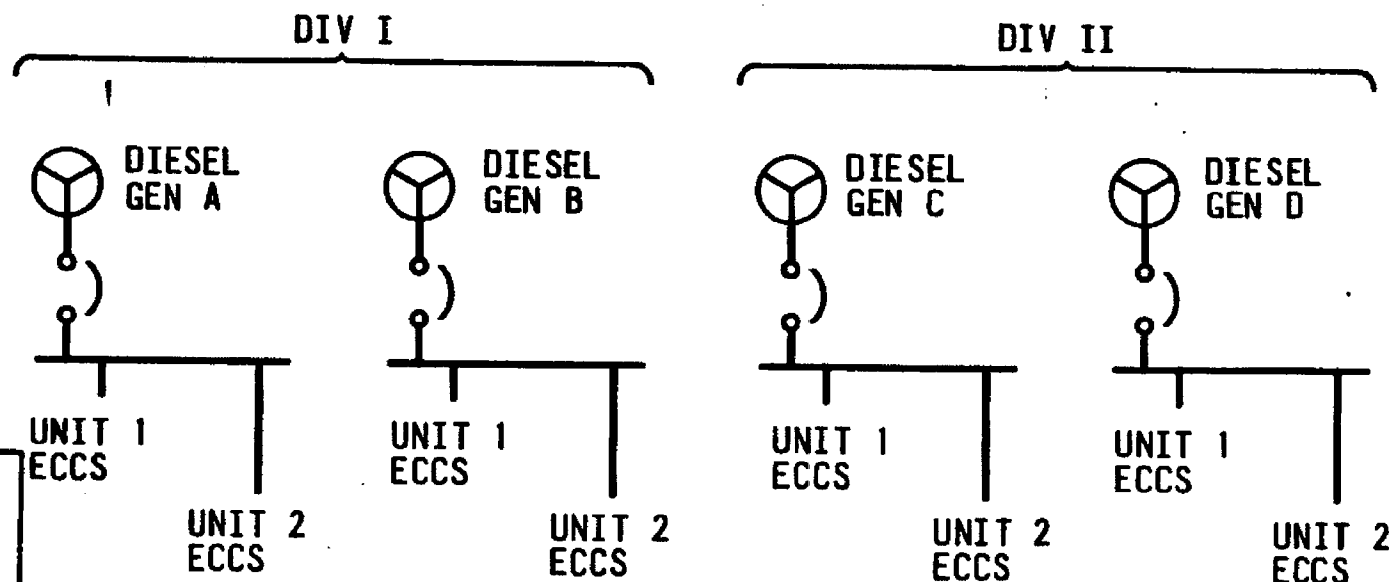
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BFN-16

Figure 8.5-21

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AMENDMENT 16

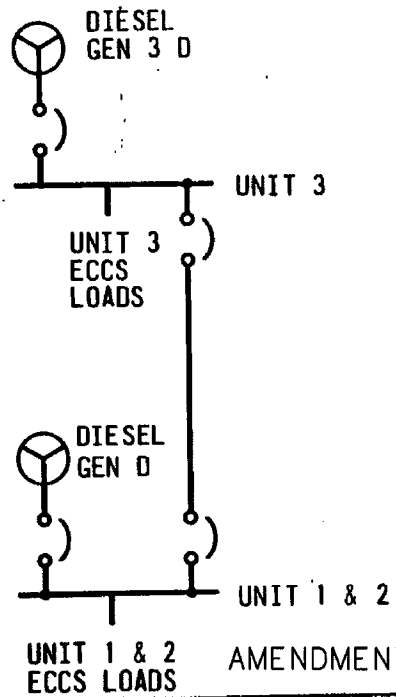
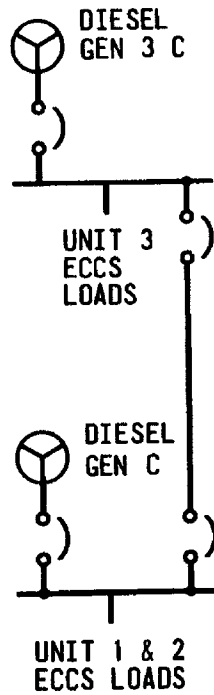
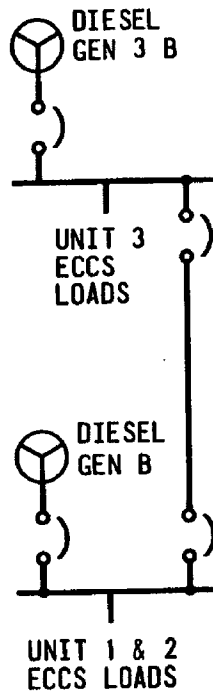
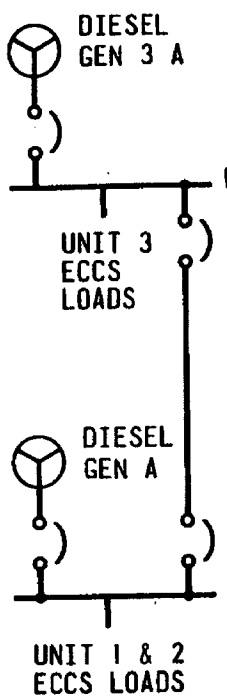
BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

Division I and II Assignments  
Units 1 and 2  
Figure 8.5-22

BFN-16

Figure 8.5-23

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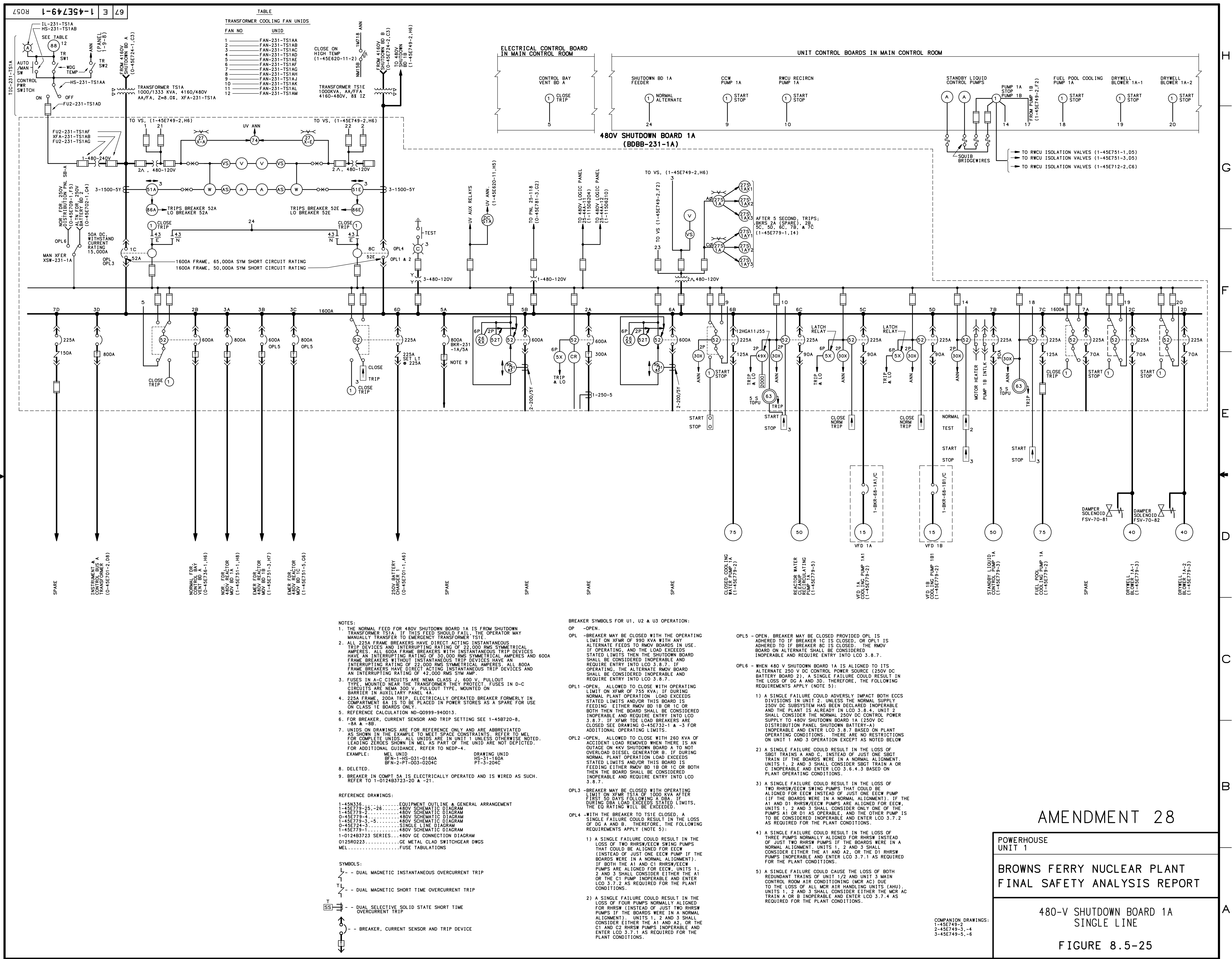
UNIT 3

UNIT 1 & 2

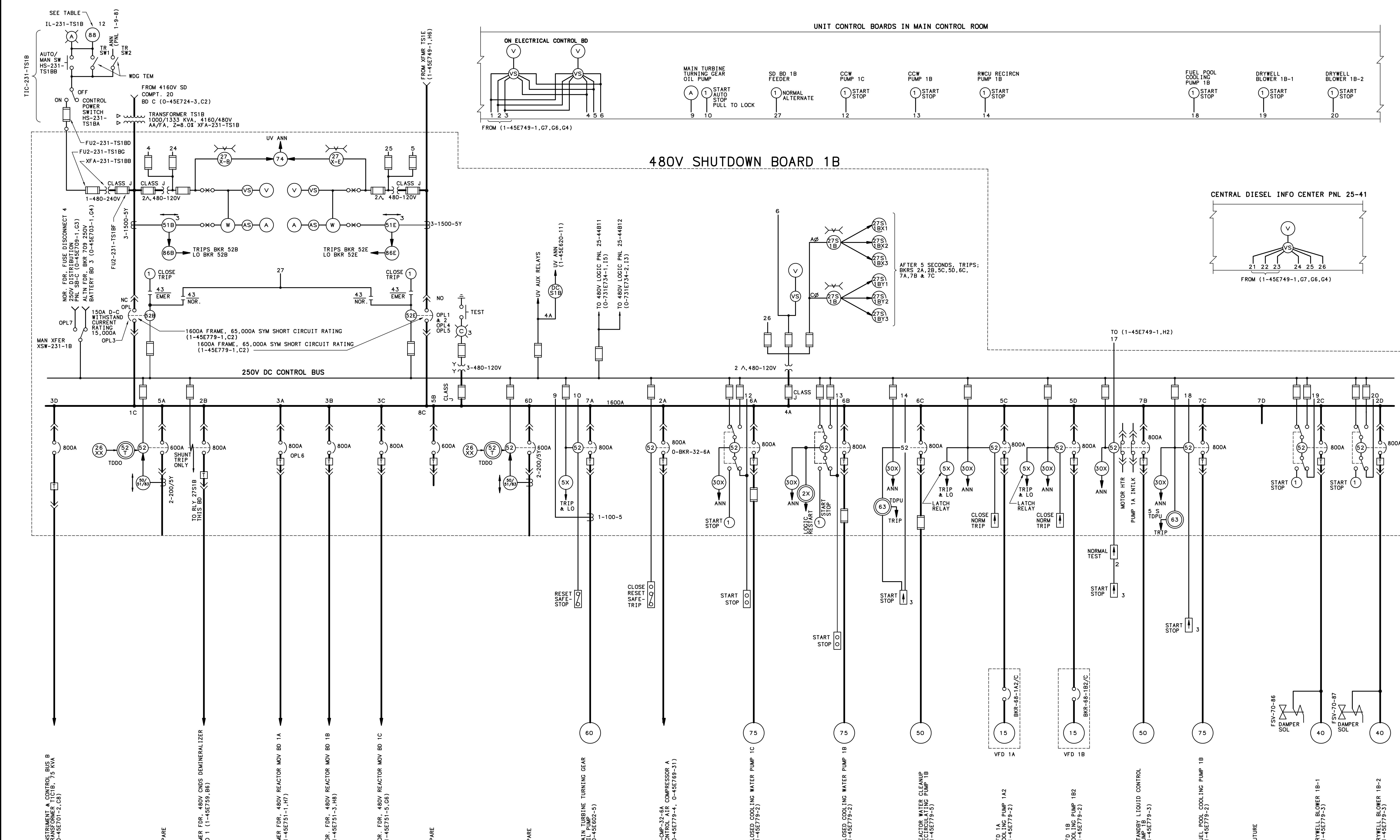
AMENDMENT 16

BROWNS FERRY NUCLEAR PLANT  
FINAL SAFETY ANALYSIS REPORT

Unit 3 - Units 1-2  
Interconnections  
Figure 8.5-24







OP1 - BREAKER MAY BE CLOSED WITH THE OPERATING LIMIT ON XPMR OF 995 KVA WITH ANY ALTERNATE FEEDING RMOW BOARD SHALL BE CONSIDERED INOPERABLE AND REQUIRE ENTRY INTO LCO 3.8.7. THE SHUTDOWN OF THE LOAD EXCEEDS STATED LIMITS AND THIS BOARD IS FEEDING RMOW BOARD SHALL BE CONSIDERED INOPERABLE AND REQUIRE ENTRY INTO LCO 3.8.7.

OP1 - OPEN - ALLOWED TO CLOSE FOR FIVE DAYS (SEE OP1.5) WITH OPERATING LIMIT ON XPMR T/SIE OF 750 KVA. IF THE BOARD EXCEEDS STATED LIMITS AND/OR THIS BOARD IS FEEDING RMOW BOARD SHALL BE CONSIDERED INOPERABLE AND REQUIRE ENTRY INTO LCO 3.8.7.

OP1 - OPEN - ALLOWED TO CLOSE FOR FIVE DAYS (SEE OP1.5) WITH 995 KVA OR 900V DOWNSTREAM BOARDS (OP1.5) FROM LOAD FROM THE BOARD EXCEEDS STATED LIMITS AND/OR THIS BOARD IS FEEDING RMOW BOARD SHALL BE CONSIDERED INOPERABLE AND REQUIRE ENTRY INTO LCO 3.8.7.

OPLS - BREAKER MAY BE CLOSED WITH OPERATING LIMIT ON  
XMR TS19 OF 1000 KVA AFTER FIRST 50 DAYS FOLLOWING  
CLOSURE. THE ALTERNATE 4KV SHUTDOWN BREAKER IS A  
LEAD LOAD AND NOT BE REDUCED TO 1000 KVA OR LESS.

OP4 - TO AVOID OVERLOADING 4KV SHUTDOWN BUS 1 DURING A  
LEAD WHEN THE BREAKER TO TS15 IS CLOSED, 480V SHUTDOWN  
BREAKER 18 SHALL BE CLOSED FOR FIVE DAYS FOLLOWING  
OR THE LOADING ON 4KV SHUTDOWN BUS 1 MUST NOT EXCEED 3.  
3.87 IF OPERATING IN MODES 1+2 OR 3+4 BECAUSE  
A SINGLE FAILURE WITH 480V SHUTDOWN BREAKER 18  
TO ITS ALTERNATE 4KV SUPPLY WILL ALSO IMPACT BOTH  
DURING FIVE DAYS FOLLOWING (480V SHUTDOWN  
DURING FIVE DAYS 480V SHUTDOWN BREAKER 18 SHALL  
BE CONSIDERED INOPERABLE AND UNIT 2 SHALL ENTER LCO  
3.7.2.4 OPERATING IN MODES 1+2 OR 3+4

2) A SINGLE FAILURE COULD RESULT IN THE LOSS OF ONE ECO  
PUMP AND ONE RHRSW/ECSH SWING PUMP THAT COULD BE A  
PUMP (INSTEAD OF TWO PUMPS). IF THE PUMPS WERE  
WERE IN A NORMAL ALIGNMENT. IF THE C1 PUMP IS ALI  
IN THE 82 RHRSW PUMPS INOPERABLE AND ENTER LCO 3.7.2.4  
OR THE C1 PUMP INOPERABLE AND ENTER LCO 3.7.2.4

3) A SINGLE FAILURE COULD RESULT IN THE LOSS OF THREE  
PUMPS. IF THE BEARERS WERE IN A NORMAL ALIGNMENT,  
PUMPS 1+2 SHALL BE CONSIDERED INOPERABLE AND UNIT 2  
THE 82 RHRSW PUMPS INOPERABLE AND ENTER LCO 3.7.2.4  
PUMPS 1+2 SHALL BE CONSIDERED INOPERABLE AND UNIT 2

OPLE - OPEN, BREAKER MAY BE CLOSED PROVIDED OPL1 IS ADHERED TO IF BREAKER T1 IS CLOSED, OR OPL1 IS ADHERED TO IF BREAKER T2 IS CLOSED. THE MAIN BOARD ON ALTERNATE SPLIT BE CONSIDERED INOPERABLE AND SHOULD ENTER INTO LCO. 19

OP17 - 480V CHUITION BOARD 19 IS ALIGNED TO ITS TERMINAL OF 250V

OP18 - 250V CHUITION POWER SUPPLY (250V DC BATTERY BOARD) 3,1. A SINGLE FAILURE COULD RESULT IN A SHORTAGE OF DC-DC SUPPLY, THEREFORE, THE FOLLOWING REQUIREMENTS APPLY (NOTE 4):

- 1) A SINGLE FAILURE COULD ADVERSELY IMPACT BOTH ECO DIVISIONS IN LCO. THEREFORE, AT LEAST THE NORMAL SUPPLY 250V DC SUBSYSTEM GAS BE KEPT IN LCO. 2) THE MAIN BOARD AND THE PLANT IS ALREADY IN LCO
- 3) UNIT 1 AND UNIT 2 ARE ALREADY IN LCO
- 4) 250V DC CONTROL POWER SUPPLY TO 480V CHUITION BOARD 19 (250V DC BATTERY BOARD) PANEL, SHUITION BATTERY(C) INOPERABLE AND ENTER LCO 3,8,7. IF OPERATING IN MODES 1, 2 OR 3.

2) THERE ARE NO RESTRICTIONS ON UNIT 3 FOR THIS ALARM

3) THERE ARE

**NOTES:**

1. FOR GENERAL NOTES, DRAWINGS AND SYMBOLS SEE 1-45E749-1.
2. THE NORMAL FEED FOR 480V SHUTDOWN BOARD 1B IS FROM SHUTDOWN TRANSFORMER 15B1. IF THIS FEED SHOULD FAIL, THE OPERATOR MAY MANUALLY RESTART THE EMERGENCY TRANSFER SYSTEM.
3. 225A FRAME, 90A TRIP ELECTRICALLY OPERATED BREAKER IN COMPARTMENT 5A IS TO BE PLACED IN POWER STORES AS A SPARE FOR USE ON CLASS 1E LOADS ONLY.
4. CALCULATION NO-0089-840013.
5. FOR BUS PROTECTION RELAY SETTINGS SEE T & C'S ORIGINATED RELAY SETTING SHEET (MANUAL).
6. FOR BREAKER, CURRENT SENSOR AND TRIP SETTING, SEE 1-45B720-9, -9A.
7. DETAIL.

REFERENCE DRAWINGS:  
CONTRACT 66-90744  
1-0124B3723.....SERIES

COMPANION DRAWINGS:  
1. 455740. 1

2-45E749-3. -4  
3-45E749-5. -6

**Abstract**

## AMENDMENT 29

POWERHOUSE UNIT 1
BROWNS FERRY NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT

480-V SHUTDOWN BOARD 1B  
SINGLE LINE

FIGURE 8.5-26



