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Regulatory Docket File

May 17, 1976

Mr. Dennis L. Ziemann, Chief
Operating Reactors - Branch 2
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Unit 2
ECCS Appendix K Single Failure Analysis
NRC Docket No. 50-237

Dear Mr. Ziemann:

Per telephone conversations with Messrs. Silver and Knight of your staff, the following additional information is provided:

1. Core spray injection valve MO-2-1402-25B is assigned to Motor Control Center (MCC) 28-1 which is powered by the 2/3 diesel generator.

2. MO-2-1402-25C is the core spray injection valve for System II and it is fed from MCC 29-1.

3. MO-2-1402-3B is the System I core spray suction valve, and it is assigned to MCC 29-4 powered by diesel generator 2.

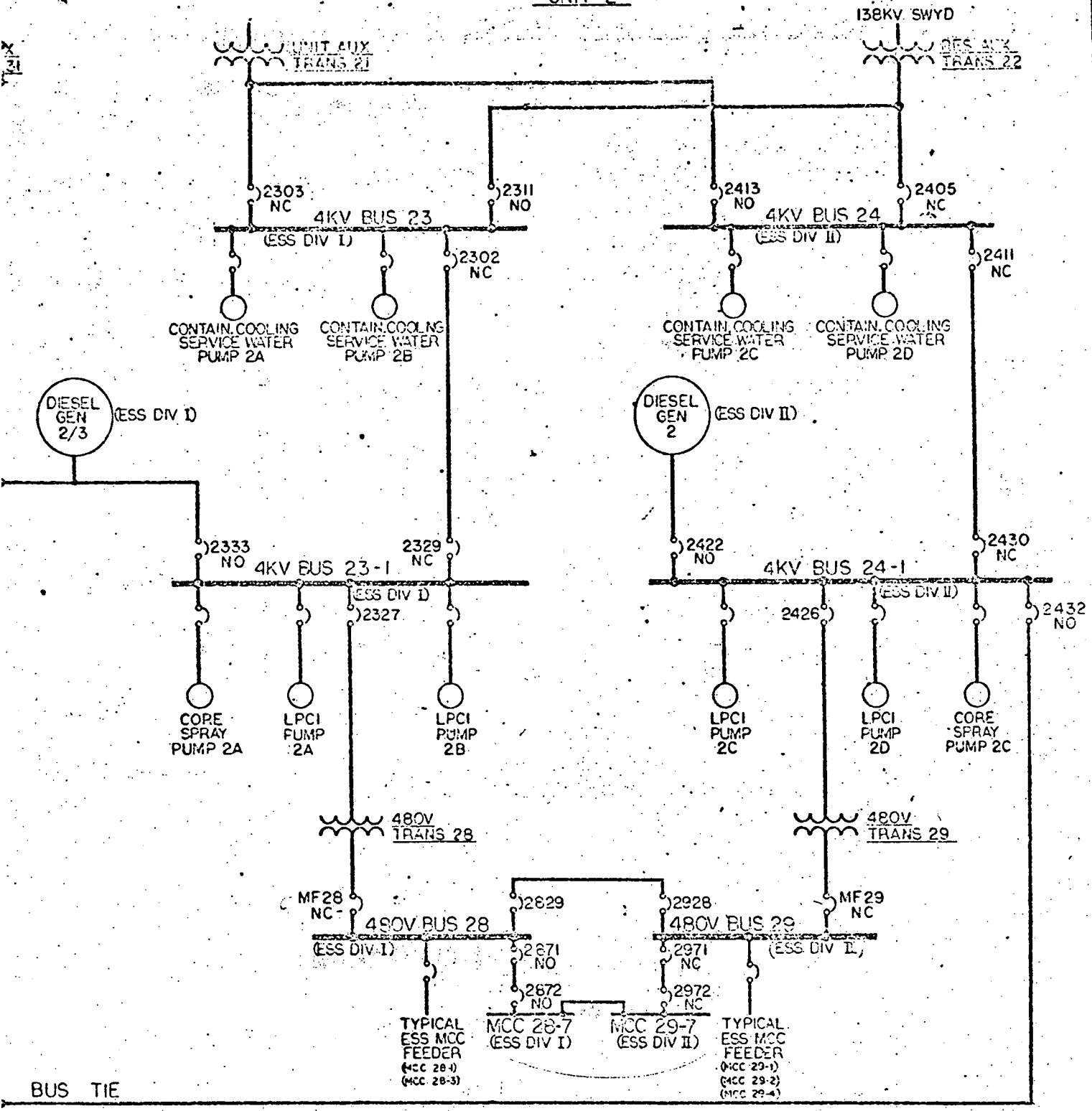
4. Diesel generator 2 cooling water pump is fed from MCC 29-2. Diesel generator 2/3 cooling water pump is fed from MCC 28-3. These MCC's are energized by the diesels in the event of a loss of off-site power. Additional auxiliaries supplied by the diesels include the starting air compressors, ventilation fan, and diesel oil transfer pumps.

5. Drywell floor drain and equipment drain pumps are prevented from starting after LOCA when their associated discharge valves close. These valves are outside the containment. Limit switches associated with these valves interlock with the pump start relays in the control cabinet (also outside the drywell) to prevent the motor contactor from closing.

6. Description of the individual controls for feeds to Bus 28 and Bus 29 and their crossties to prevent paralleling of Bus 28 and Bus 29 are provided below. Refer to drawing 12E 2328 for location of breaker by number.

DRESDEN STATION

UNIT 2



REVISIONS	SINGLE LINE DIAGRAM EMERGENCY POWER SYSTEM
	DRESDEN NUCLEAR POWER STATION UNIT 2 & 3 GENERAL ELECTRIC CO. FOR COMMONWEALTH EDISON CO. CHICAGO, ILLINOIS
	DRAWN G. VASS
	SARGENT & LUNDY INCORPORATED ENGINEERS CHICAGO
	12E-2328

Bus 28 - Main Feed Breaker ACB 242-MF28

Reference Drawing 12E 2349

This electrically operated breaker is manually controlled by a control switch located at Main Control Board Panel No. 902-8 only. Note that a single (common) switch is used to control 4160 volt breaker 152-2327 and 480 volt breaker 252-MF28.

The interlocks with the transformer 4160 volt supply ACB 152-2327 are such that; i.e., 480 volt Bus 28 main feed ACB 252-MF 28 cannot be closed unless the 4160 volt breaker is first closed and it is automatically tripped when the 4160 volt breaker is tripped. This breaker does not close automatically.

The auxiliary switch on ACB 252-MF28 interlocks the following:

A. "a" and "b" contacts interlock close ACB 252-2829.

B. "a" contacts trip ACB 252-2829.

C. "b" contacts interlock close ACB 152-2426.

D. "b" contacts interlock trip alarm 2113 on ACB 152-2327.

Note: Cell switch "b" contacts (HMA/b) interlock closure of ACB 252-2829 when ACB 252-MF28 is removed from its cubicle.

Bus 28 - Tie to 480 Volt Switchgear Bus 29 ACB 252-2829

Reference Drawing 12E 2349

This electrically operated breaker is manually controlled by a control switch located at Main Control Board Panel 902-8 only and does not close automatically.

The breaker 252-2829 can be closed manually by means of the control switch provided that either:

A. Breaker 252-MF28 is closed with breaker 252-MF29 open, or,

B. Breaker 252-MF28 is open with breaker 252-MF29 closed.

The breaker 252-2829 can be tripped by either one of the following:

A. Turning control switch on panel 902-8 to "TRIP" position.

B. Simultaneous closure of breakers 252-MF28 and 252-MF29.

The auxiliary switch on breaker 252-2829 interlocks the following:

A. "b" contacts interlock close ACB 152-2426.

B. "b" contacts interlock close ACB 152-2327.

C. "a" contacts interlock "CLOSED" alarm.

Bus 29 - Main Feed ACB 252-MF29

Reference Drawing 12E 2349

This electrically operated breaker is manually controlled by a control switch located at Main Control Board Panel No. 902-8 only. Note that a single (common) switch is used to control 4160 volt breaker 152-2426 and 480 volt breaker 252-MF29.

The interlocks with the transformer 4160 volt supply ACB 152-2426 are such that 480 volt Bus 29 main feed ACB 252-MF29 cannot be closed unless the 4160 volt breaker is first closed and it is automatically tripped when the 4160 volt breaker is tripped. This breaker does not close automatically.

Note: Cell switch "b" contacts (HMA/b) interlock closure of ACB 252-2829 when ACB 252-MF29 is removed from its cubicle.

The auxiliary switch on ACB 252-MF29 interlocks the following:

A. "a" contacts close ACB 252-2829.

B. "b" contacts close ACB 252-2829.

C. "a" contacts trip ACB 252-2829.

D. "b" contacts interlock closure of ACB 152-2327.

E. "b" contacts interlock alarm 2115 for ACB 152-2426 trip.

Bus 29 - Tie to 480 Volt Switchgear Bus 28 ACB 252-2928

Reference Drawing 12E 2349

This electrically operated breaker is manually controlled by a

control switch located at Main Control Board Panel No. 902-8 only. This breaker cannot be closed automatically.

The breaker ACB 252-2928 can be closed by means of the control switch on panel 902-8 provided that:

A. ACB 152-2327 is open and ACB 152-2426 is closed, or,

B. ACB 152-2327 is closed and ACB 152-2426 is opened.

The breaker ACB 252-2928 is tripped by any one of the following:

A. Turning control switch to "TRIP" position on panel 902-8.

B. Simultaneous closure of ACB 152-2327 and ACB 152-2426.

The auxiliary switch contacts on breaker ACB 252-2928 are not utilized.

7. Response 3 reference (a) addressed the seismic and environmental qualifications of all ECCS equipment except for the electrical motor control centers, diesels, and switchgear.

   The design basis earthquake from Dresden Units 2 and 3 was .2g horizontal.

   Sargent and Lundy Specification K-2203 for 480v buses and switchgear required it to be designed for a .2g horizontal seismic event.

   Sargent and Lundy Specification K-2204 for 480v motor control centers (MCC) required a design for a .2g horizontal seismic event.

   Sargent and Lundy Specification K-2183 required construction and mounting for all equipment necessary to complete the diesel generator installation to such that a .2g horizontal component of acceleration would not cause damage or interruption of electrical service from them.

   Although not explicit in the specification for 4kv switchgear, documentation is available from the General Electric Company that this equipment does meet the .2g horizontal seismic criterion.

8. Fault protection for MCC 28-7 and 29-7 are provided by trip devices within the breaker. A table of significant data

for the breakers involved is attached. Also attached are the breaker curves for these breakers. It can be seen that no overlap exists and, therefore, it is not possible to propagate a fault from MCC-28-7/29-7 back to the 480v switchgear 28 or 29.

Fault Current on Buses 28-7, 29-7

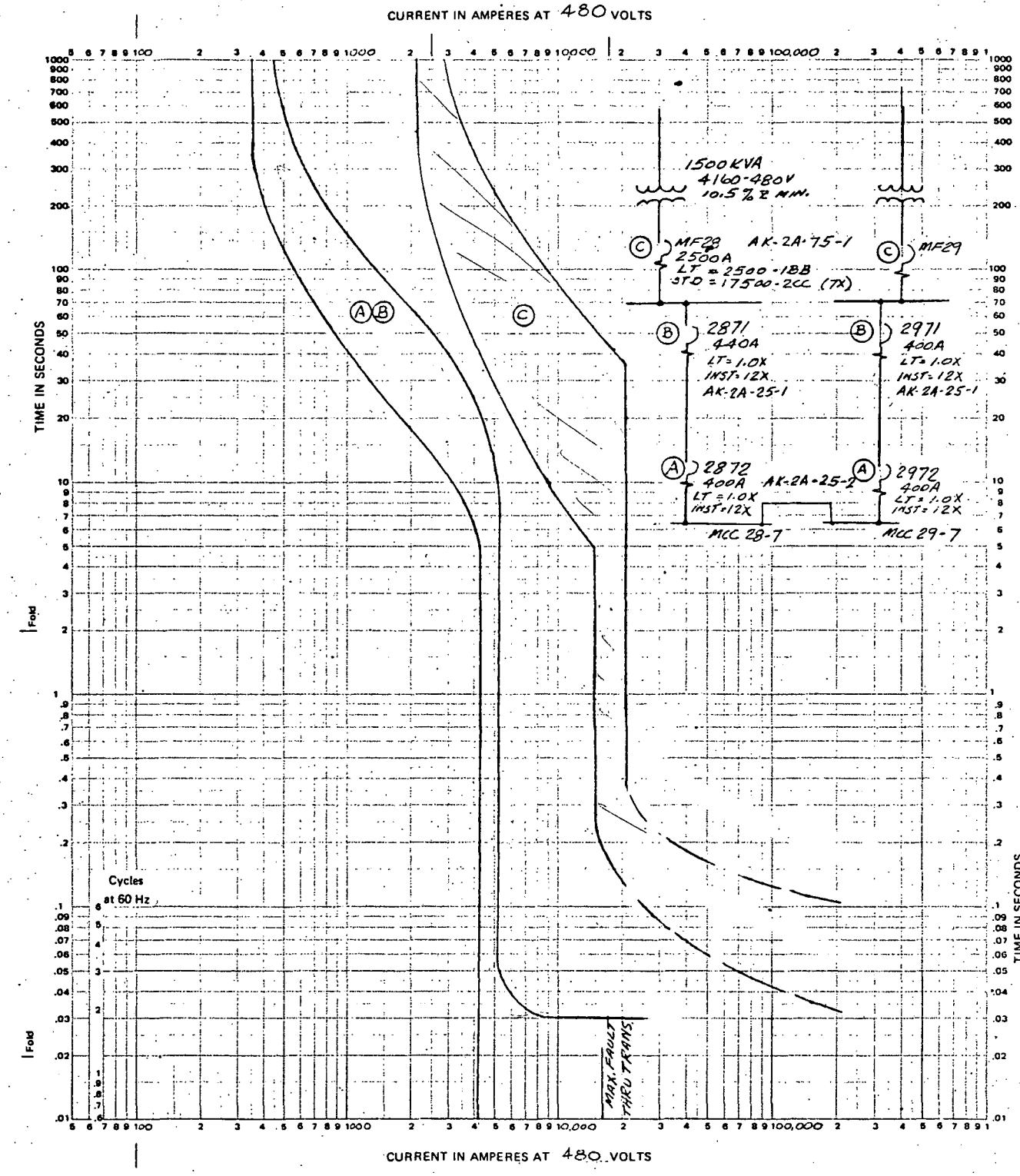
Breaker Number	Frame Size Amps	Trip Coil Rating Amps	Setting (% of Trip Coil Rate)	Instantaneous Setting (Times Coil)
MF28	3000	2500	2500 amps	2CC curve 17500 amps
MF29	"	"	"	"
2971	600	400	100%	6x to 12x range
2972	600	400	100%	6x - 12x range
2871	600	400	110%	6x - 12x range
2872	600	400	100%	6x - 12x range

9. **The interlock and automatic transfer details between 480v Buses 28 and 29 for the LPCI valve buses 28-7/29-7.** Refer to 12E-2328 for breaker location by number.

The normal feed to MCC 28/7 - 29/7 is from 480v AC Bus 29. Should under voltage develop on Bus 29 for 15 seconds an automatic transfer to Bus 28 is initiated. The 15 second time delay prevents a premature transfer while the diesel generator is coming up to speed in the event of loss of all off-site power.

After the time delay relay times out, Breaker 2971 at Bus 29 will trip. Auxiliary contacts from Breaker 2971 will close 2871 (in conjunction with low voltage on Bus 29) and will trip Breaker 2972. Breaker 2872 will close automatically when breaker 2871 is closed and breaker 2972 is open.

Details of breaker controls are attached.



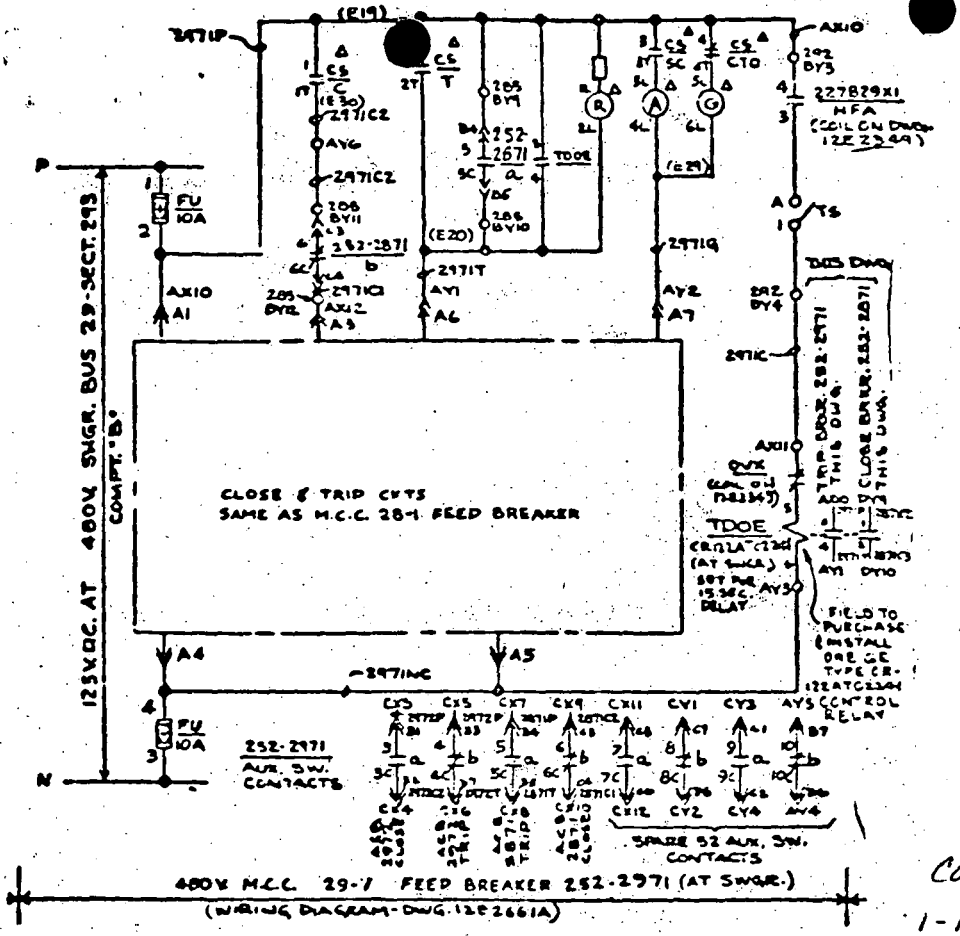
TIME-CURRENT CURVES

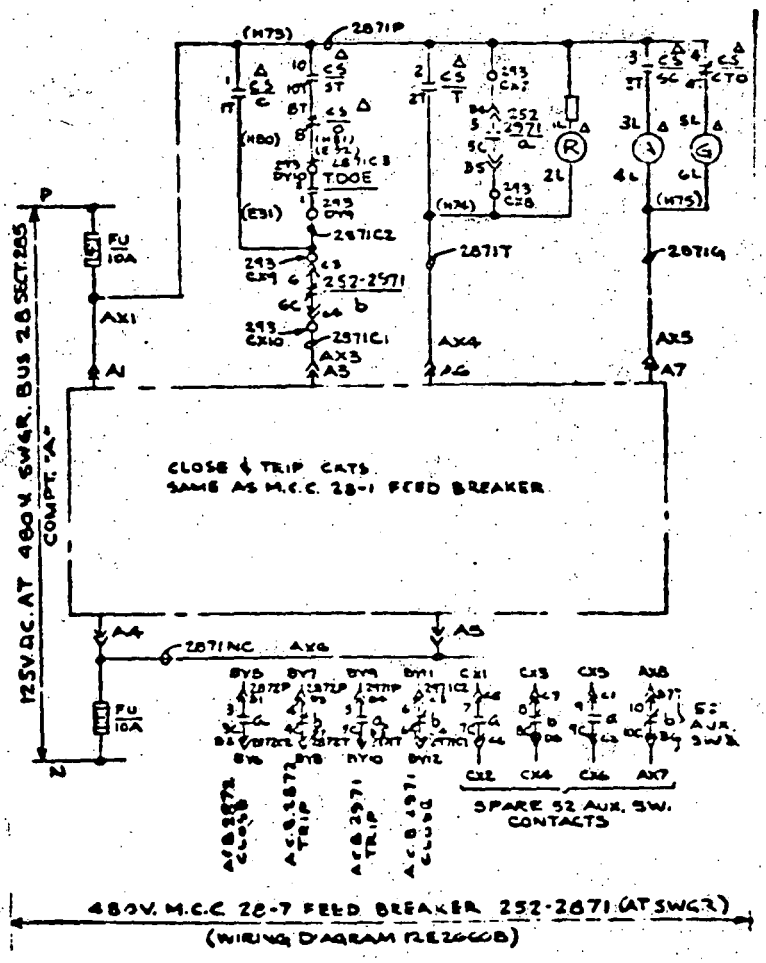
COMMONWEALTH EDISON CO.
DRESDEN STATION UNIT 2
SWITCHGEAR BUSES 28 & 29
PROJ. NO. 5281

NO.

DATE 5-12-76
DRAWN BY RA Shick
COMPONENT
LOCATION

K&E 10 5133 1-74 TEM 1265
FORM FN-822-SP (1-74)



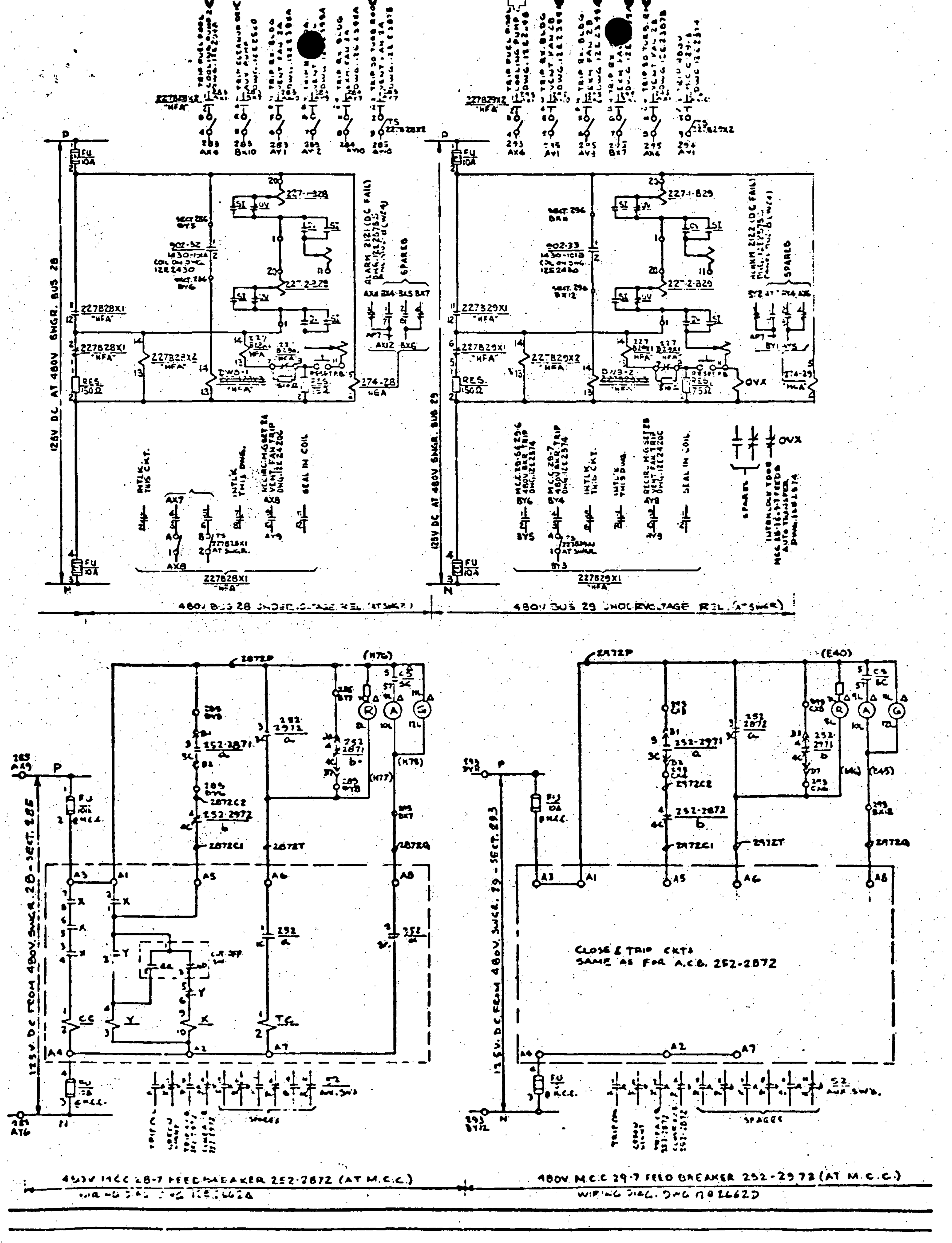


CONTROL SWITCH DEVELOPMENT

1-1T CLOSED IN "CLOSE"

2-2T CLOSED IN "TRIP" & "PULL TO LOCK"

10-10T CLOSED IN "TRIP", "PULL TO LOCK" AND "AFTER CLOSE" POSITION


125V DC AT 480V SWGR. BUS 28
227B28X1 "HFA"
227B28X2 "HFA"
INTLK. THIS CKT.
INTLK. THIS DWG.
SEAL IN COIL
SPARES
ALARM 2121 (D.C FAIL)
480V BUS 28 UNDERVOLTAGE REL. (AT SWGR.)
125V DC AT 480V SWGR. BUS 29
227B29X1 "HFA"
227B29X2 "HFA"
SEAL IN COIL
SPARES
ALARM 2122 (D.C FAIL)
480V BUS 29 UNDERVOLTAGE REL. (AT SWGR.)
125V. DC FROM 480V. SWGR. 28 - SECT. 285
125V. DC FROM 480V. SWGR. 29 - SECT. 293
CLOSE & TRIP CKTS SAME AS FOR A.C.B. 252-2872
SPARES
480V MCC 28-7 FEEDBREAKER 252-2872 (AT M.C.C.)
480V M.C.C 29-7 FEED BREAKER 252-2972 (AT M.C.C.)
WIRING DIAG. DWG 11 E 2662D

Please contact this office if you have any additional questions.

One (1) signed original and 39 copies are provided for your use.

Very truly yours,

G. A. Abrell
Nuclear Licensing Administrator
Boiling Water Reactors

Enclosures